



| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.54 max<br>Block - 500°F - 0.38 max | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      | Formed and comp on mandril. Pipe mach cut on dia                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.                                                                                                             | Alltemp<br>Philip Corey Co                                   | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kaylo 20<br>Owens-Corning Corp                               |                                                                                                                                                                           |
| ** Max temp of Kaylo 20 is 1800°F                                                                                                                                    |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
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CONFIDENTIAL



DUP 0960861

145

OCTOBER 1954

## MATERIAL SPECIFICATION - SERIES 100

SM 100 M

Rev Sept 1958

Page 3

| Code                                                                                                                                                                    | 107                                                                                               | 108 | 109                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                                | Asbestos sponge                                                                                   |     | Corrugated asbestos<br>preshrunk                                                                    |
| Material Description                                                                                                                                                    | Asbestos sheets separated<br>by finely ground sponged<br>material bonded with<br>adhesive strips. |     | Alternate layers of plain<br>and corrugated asbestos<br>sheets.<br>Outer covering asbestos<br>felt. |
| Filler                                                                                                                                                                  |                                                                                                   |     |                                                                                                     |
| Binder                                                                                                                                                                  |                                                                                                   |     |                                                                                                     |
| Temperature<br>Range                                                                                                                                                    | 100°F to 700°F                                                                                    |     | 100°F to 400°F                                                                                      |
| K Factor                                                                                                                                                                | 500°F - 0.60 max                                                                                  |     | 200°F - 0.58 max                                                                                    |
| Density                                                                                                                                                                 | 30 lb max                                                                                         |     |                                                                                                     |
| Compressive<br>Strength                                                                                                                                                 |                                                                                                   |     |                                                                                                     |
| Manufacturing<br>Process                                                                                                                                                | Laminated - 38 to 42<br>layers per in. of thickness                                               |     | 3-ply laminate                                                                                      |
| Resistance to Breakage<br>in Handling                                                                                                                                   | Very good                                                                                         |     | Good                                                                                                |
| Dimensions                                                                                                                                                              | To Specification                                                                                  |     |                                                                                                     |
| Other                                                                                                                                                                   |                                                                                                   |     |                                                                                                     |
| Qualifications                                                                                                                                                          | Must be a flexible product                                                                        |     | Preshrunk                                                                                           |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that<br>their product meets the above specifications. |                                                                                                   |     |                                                                                                     |
| * Aircell -4-ply<br>Excel -6-ply<br>Cavacel-8-ply                                                                                                                       | Asbestos Sponge<br>Johns-Manville Sales Corp                                                      |     | Preshrunk Asbestoscel<br>Johns-Manville Sales Corp                                                  |
|                                                                                                                                                                         | Asbestos Sponge<br>Philip Carey Mfg Co                                                            |     | Aircell *<br>Philip Carey Mfg Co                                                                    |
|                                                                                                                                                                         | Sponge Felt<br>The Ruberoid Co                                                                    |     | K & M - Aircell<br>Keesbey & Mattison Co                                                            |
|                                                                                                                                                                         | Sponge Felt<br>Ehret Mfg Mfg Co, Inc                                                              |     | B-H Aircell<br>Baldwin-Hill Co                                                                      |
|                                                                                                                                                                         | Sponge Felt<br>Smith and Kensler Corp                                                             |     |                                                                                                     |
|                                                                                                                                                                         |                                                                                                   |     |                                                                                                     |
|                                                                                                                                                                         |                                                                                                   |     |                                                                                                     |
|                                                                                                                                                                         |                                                                                                   |     |                                                                                                     |
| CONFIDENTIAL                                                                                                                                                            |                                                                                                   |     |                                                                                                     |
|                                                                                      |                                                                                                   |     |                                                                                                     |
| DUP 0960862                                                                                                                                                             |                                                                                                   |     |                                                                                                     |

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| SN 100 M                                                                                                                                                             |                                                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                    |                                 | OCTOBER 1954  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------|---------------|
| Page 4                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 | Rev Sept 1958 |
| Code                                                                                                                                                                 | 110                                                                                                                                                     | 111                                                    | 112                             |               |
| Material                                                                                                                                                             | Vegetable cork                                                                                                                                          | Cellular glass                                         | Glass fiber                     |               |
| Material Description                                                                                                                                                 | Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation. | Cellular glass foamed and fused into unicellular form. | See codes 112.01 through 112.81 |               |
| Filler                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 |               |
| Binder                                                                                                                                                               | Natural resin in cork                                                                                                                                   |                                                        |                                 |               |
| Temperature Range                                                                                                                                                    | -200°F to 100°F                                                                                                                                         | -200°F to 100°F<br>(+300°F for dual temp)              |                                 |               |
| K Factor                                                                                                                                                             | 100°F - 0.29 max                                                                                                                                        | 100°F - 0.43 max                                       |                                 |               |
| Density                                                                                                                                                              | 9 - 11 lb per cu ft                                                                                                                                     | 10 - 11 lb per cu ft                                   |                                 |               |
| Compressive Strength                                                                                                                                                 | 15 lb per sq in. min                                                                                                                                    | 35 lb per sq in. min                                   |                                 |               |
| Manufacturing Process                                                                                                                                                | Machine comp. or molded. Baked at moderate temp                                                                                                         |                                                        |                                 |               |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                    |                                                        |                                 |               |
| Dimensions                                                                                                                                                           |                                                                                                                                                         |                                                        |                                 |               |
| Other Qualifications                                                                                                                                                 | Pipe covering shall be coated on the outside with heavy mastic                                                                                          |                                                        |                                 |               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                         |                                                        |                                 |               |
| CONFIDENTIAL                                                                                                                                                         | Cork                                                                                                                                                    | Foamglas                                               |                                 |               |
|                                                                                                                                                                      | Armstrong Cork Co                                                                                                                                       | Pittsburgh Corning Corp                                |                                 |               |
|                                                                                                                                                                      | Cork                                                                                                                                                    |                                                        |                                 |               |
|                                                                                                                                                                      | Mundet Cork Co                                                                                                                                          |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
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146

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DUP 0960863



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97

| OCTOBER 1954                                                                                                                                                         |                                                                                       | MATERIAL SPECIFICATION - SERIES 100 |  | SN 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|--|----------|
| Rev Dec 1958                                                                                                                                                         |                                                                                       |                                     |  | Page 5   |
| Code                                                                                                                                                                 | 112.01                                                                                | 112.02                              |  |          |
| Material                                                                                                                                                             | Glass fiber                                                                           | See Code 112.01                     |  |          |
| Material Description                                                                                                                                                 | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                     |  |          |
| Filler                                                                                                                                                               |                                                                                       |                                     |  |          |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                          |                                     |  |          |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                         |                                     |  |          |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                          |                                     |  |          |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                |                                     |  |          |
| Compressive Strength                                                                                                                                                 |                                                                                       |                                     |  |          |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                        |                                     |  |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                             |                                     |  |          |
| Dimensions                                                                                                                                                           |                                                                                       |                                     |  |          |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                        |                                     |  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                       |                                     |  |          |
| CONFIDENTIAL                                                                                                                                                         | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                             |                                     |  |          |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                           |                                     |  |          |
|                                                                                                                                                                      | *Thermoglas<br>Philip Cary Mfg Co                                                     |                                     |  |          |
|                                                                                                                                                                      | *Fiberglas<br>Owens-Corning Corp                                                      |                                     |  |          |
|                                                                                                                                                                      | *Armoglas PF Pipe Insu<br>Armstrong Cork Co                                           |                                     |  |          |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                 |                                     |  |          |
|                                                                                                                                                                      |                                                                                       |                                     |  |          |
|                                                                                                                                                                      |                                                                                       |                                     |  |          |



DUP 0960864

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| SN 100 M                                                                                                                                                             |                                                                                                                                                                                | OCTOBER 1954 |              |
| Page 6                                                                                                                                                               |                                                                                                                                                                                | Rev Oct 1959 |              |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                                                                                |              |              |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12       |              |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11   |              |
| Material Description                                                                                                                                                 | Textile type fine glass fiber banded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |              |              |
| Filler                                                                                                                                                               |                                                                                                                                                                                |              |              |
| Binder                                                                                                                                                               | Phenol-formaldehyde or DI-Cy                                                                                                                                                   |              |              |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |              |              |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |              |              |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                                                                         |              |              |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |              |              |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |              |              |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |              |              |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |              |              |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |              |              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |              |              |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on Gustin-Bacon Mfg Co                                                                                                                                        |              | CONFIDENTIAL |
|                                                                                                                                                                      | * Mono-Kover Baldwin-Hill                                                                                                                                                      |              |              |
|                                                                                                                                                                      | * Thermoglas Philip Carey Mfg Co                                                                                                                                               |              |              |
|                                                                                                                                                                      | ** Fiberglas Owens-Corning Corp                                                                                                                                                |              |              |
|                                                                                                                                                                      | ** Armaglas PF Pipe Insu Armstrong Cork Co                                                                                                                                     |              |              |
|                                                                                                                                                                      | * Aerolag Johns-Manville Sales Corp                                                                                                                                            |              |              |
|                                                                                                                                                                      | * PPG Glass Fiber Pitts Plate Glass Co                                                                                                                                         |              |              |
|                                                                                                                                                                      | * Micro-Lok J-M Fiber Glass, Inc                                                                                                                                               |              |              |
|                                                                                                                                                                      |                                                                                                                                                                                |              |              |



DUP 0960865

XYZ AA 55

113

| Code                               | 112.16                                                                                        | 112.17                                                                                        |  |
|------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|
| Material                           | Glass fiber                                                                                   | Glass fiber                                                                                   |  |
| Material Description               | Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish. | Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish. |  |
| Filler                             |                                                                                               |                                                                                               |  |
| Binder                             | Phenol-formaldehyde or Di-Cy                                                                  | Phenol-formaldehyde or Di-Cy                                                                  |  |
| Temperature Range                  | 80°F to 300°F                                                                                 | 80°F to 300°F                                                                                 |  |
| K Factor                           | 100°F - 0.25                                                                                  | 100°F - 0.25                                                                                  |  |
| Density                            | 3" and 6" lb per cu ft                                                                        | 3" and 6" lb per cu ft                                                                        |  |
| Compressive Strength               |                                                                                               |                                                                                               |  |
| Manufacturing Process              | Machine molded                                                                                | Machine molded                                                                                |  |
| Resistance to Breakage in Handling | Very good                                                                                     | Very good                                                                                     |  |
| Dimensions                         |                                                                                               |                                                                                               |  |
| Other Qualifications               | Specify whether for iron pipe or copper tubing                                                | Specify whether for iron pipe or copper tubing                                                |  |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

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|                                          |                                          |  |
|------------------------------------------|------------------------------------------|--|
| *Ultrafine Snap-on Gustin-Bacon Mfg Co   | *Ultrafine Snap-on Gustin-Bacon Mfg Co   |  |
| *Mono-Kover Baldwin-Hill                 | *Mono-Kover Baldwin-Hill                 |  |
| *Thermoglas Philip Carey Mfg Co          | *Thermoglas Philip Carey Mfg Co          |  |
| *Fiberglas Owens-Corning Corp            | *Fiberglas Owens-Corning Corp            |  |
| *Armoglas PF Pipe Insu Armstrong Cork Co | *Armoglas PF Pipe Insu Armstrong Cork Co |  |
| *Aerogel Johns-Manville Sales Corp       | *Aerogel Johns-Manville Sales Corp       |  |
| *PPG Glass Fiber Pitts Plate Glass Co    | *PPG Glass Fiber Pitts Plate Glass Co    |  |
| *Micro-Lok J-M Fiber Glass Inc           | *Micro-Lok J-M Fiber Glass Inc           |  |
|                                          |                                          |  |



DUP 0960866

XYZ 44 EE

SN 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

Page 8

Rev May 1959

| Code                                                                                                                                                                 | 112.21                                                                                                                  | 112.22                                                                                                                  | 112.23                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                                                         |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with factory-applied white bleached kraft paper, laminated to the outer face of aluminum foil. |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde                                                                                                                                 |
| Temperature Range                                                                                                                                                    | 40°F to 200°F                                                                                                           | 40°F to 200°F                                                                                                           | 100°F to 250°F                                                                                                                                      |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                                                        |
| Density                                                                                                                                                              | 3" and 6" 1b per cu ft                                                                                                  | 3" and 6" 1b per cu ft                                                                                                  | 3 lb per cu ft min                                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                                                         | Very low                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          | Machine molded                                                                                                          | Machine molded                                                                                                                                      |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               | Very good                                                                                                               | Very good                                                                                                                                           |
| Dimensions                                                                                                                                                           |                                                                                                                         |                                                                                                                         | 1/2 and 3/4 thick<br>3 ft sections                                                                                                                  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Low cost insulation for limited services such as hot water.                                                                                         |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| CONFIDENTIAL                                                                                                                                                         | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | Universal Jacket<br>Owens-Corning Corp                                                                                                              |
|                                                                                                                                                                      | *Veno-Kover<br>Baldwin-Hill                                                                                             | *Veno-Kover<br>Baldwin-Hill                                                                                             |                                                                                                                                                     |
|                                                                                                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      |                                                                                                                                                     |
|                                                                                                                                                                      | *Fiberglas<br>Owens-Corning Corp                                                                                        | *Fiberglas<br>Owens-Corning Corp                                                                                        |                                                                                                                                                     |
|                                                                                                                                                                      | *Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                             | *Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                             |                                                                                                                                                     |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                                                   | *Aerolag<br>Johns-Manville Sales Corp                                                                                   |                                                                                                                                                     |
|                                                                                                                                                                      | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                |                                                                                                                                                     |
|                                                                                                                                                                      | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |

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DUP 0960867

OCTOBER 1954

Rev July 1959

## MATERIAL SPECIFICATION - SERIES 100

SH 100 M

Page 9

| Code                               | 112.61                                                                                                         |  | 112.66                                                                                                                                                            |
|------------------------------------|----------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                           | Glass fiber                                                                                                    |  | Glass fiber                                                                                                                                                       |
| Material Description               | Plain semi-rigid board, formed from fibrous glass or mineral fibers.                                           |  | Short, coarse steam-blown glass fibers preformed into semi-rigid board, sanded on one side and cut into logging sizes for ease of application to curved surfaces. |
| Filler                             |                                                                                                                |  |                                                                                                                                                                   |
| Binder                             | Phenol-formaldehyde                                                                                            |  | Phenol-formaldehyde                                                                                                                                               |
| Temperature Range                  | 40°F to 350°F                                                                                                  |  | 40°F to 350°F                                                                                                                                                     |
| K Factor                           | 100°F - 0.25 to 0.30                                                                                           |  | 100°F - 0.25                                                                                                                                                      |
| Density                            | 6 and 9 lb per cu ft                                                                                           |  | 9 lb per cu ft                                                                                                                                                    |
| Compressive Strength               |                                                                                                                |  |                                                                                                                                                                   |
| Manufacturing Process              | Machine molded                                                                                                 |  | Machine molded                                                                                                                                                    |
| Resistance to Breakage in Handling | Very good                                                                                                      |  | Very good                                                                                                                                                         |
| Dimensions                         | Std 24" x 48"<br>Thickness PF615 (6-lb density) 1/2" through 3",<br>PF617 (9-lb density), 1/2" through 2 1/4". |  | Length - 36"<br>Width - 6" or 12"<br>Thickness - 3/4", 1", 1 1/4", 1 1/2", and 2".                                                                                |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|              |                                                            |  |                                                  |
|--------------|------------------------------------------------------------|--|--------------------------------------------------|
| CONFIDENTIAL | Fiberglas PF615 or 617<br>Insulation<br>Owens-Corning Corp |  | Fiberglas Block Insulation<br>Owens-Corning Corp |
|              | Armtemp Spun Wool<br>Duct - Plain<br>Armstrong Cork Co     |  | Armaglas Block Insulation<br>Armstrong Cork Co   |
|              | Spintex No. 414 or 415<br>Johns-Manville Co                |  |                                                  |
|              | Spunduct<br>Baldwin-Hill Co                                |  |                                                  |
|              |                                                            |  |                                                  |
|              |                                                            |  |                                                  |
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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--|-------------------------------------------------------------------------------------------------------------------|--|
| SN 100 M                                                                                                                                                             |                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100 |  | OCTOBER 1954                                                                                                      |  |
| Page 10                                                                                                                                                              |                                                                                                                         |                                     |  | Rev July 1959                                                                                                     |  |
| Code                                                                                                                                                                 | 112.71                                                                                                                  |                                     |  | 112.81                                                                                                            |  |
| Material                                                                                                                                                             | Glass fiber                                                                                                             |                                     |  | Glass fiber                                                                                                       |  |
| Material Description                                                                                                                                                 | Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish. |                                     |  | Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface. |  |
| Filler                                                                                                                                                               |                                                                                                                         |                                     |  |                                                                                                                   |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                                     |                                     |  | Phenol-formaldehyde                                                                                               |  |
| Temperature Range                                                                                                                                                    | 40°F to 150°F                                                                                                           |                                     |  | 40°F to 150°F                                                                                                     |  |
| K Factor                                                                                                                                                             | 100°F - 0.26                                                                                                            |                                     |  | 100°F - 0.26                                                                                                      |  |
| Density                                                                                                                                                              | 6 lb per cu ft                                                                                                          |                                     |  | 6 lb per cu ft                                                                                                    |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                     |  |                                                                                                                   |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          |                                     |  | Machine molded                                                                                                    |  |
| Resistance to Breakage Handling                                                                                                                                      | Very good                                                                                                               |                                     |  | Very good                                                                                                         |  |
| Dimensions                                                                                                                                                           | 24" x 48" boards<br>3/4" to 2" thickness                                                                                |                                     |  | 24" x 48" boards<br>3/8" to 2" thickness                                                                          |  |
| Other Qualifications                                                                                                                                                 |                                                                                                                         |                                     |  | Neoprene coating on side of board exposed to air flow                                                             |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                     |  |                                                                                                                   |  |
| CONFIDENTIAL                                                                                                                                                         | Fiberglas Vapor Seal Duct Insu Owens-Corning Corp                                                                       |                                     |  | Fiberglas Coated Duct Insu Owens-Corning Corp                                                                     |  |
|                                                                                                                                                                      | Armatemp Spun Wool Duct - Faced VB Armstrong Cork Co                                                                    |                                     |  | Armatemp Spun Wool Duct - Coated Armstrong Cork Co                                                                |  |
|                                                                                                                                                                      | Spintex No. 414VS Johns-Manville Co                                                                                     |                                     |  | Coated Duct Insulation Baldwin-Hill Co                                                                            |  |
|                                                                                                                                                                      | Spanduct Baldwin-Hill Co                                                                                                |                                     |  |                                                                                                                   |  |
|                                                                                                                                                                      |                                                                                                                         |                                     |  |                                                                                                                   |  |
|                                                                                                                                                                      |                                                                                                                         |                                     |  |                                                                                                                   |  |
|                                                                                                                                                                      |                                                                                                                         |                                     |  |                                                                                                                   |  |
|                                                                                                                                                                      |                                                                                                                         |                                     |  |                                                                                                                   |  |

DUP 0960869

OCTOBER 1954

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev. Oct. 1954

Page 11

| Code                               | 113             | 114                       | 115                                                                   |
|------------------------------------|-----------------|---------------------------|-----------------------------------------------------------------------|
| Material                           | See Code 112.81 | Mineral wool (Block only) | Mineral wool - asphalt impregnated                                    |
| Material Description               |                 | Mineral slag wool         | Mineral wool fibers homogeneously impregnated with an asphalt binder. |
| Filler                             |                 |                           |                                                                       |
| Binder                             |                 | High temp. binder         | Asphalt                                                               |
| Temperature Range                  |                 | 500°F to 1700°F           | -200°F to 100°F                                                       |
| K Factor                           |                 | 500°F - 0.45 max.         | 100°F - 0.34 max.                                                     |
| Density                            |                 | 19.2 lb. per cu. ft.      |                                                                       |
| Compressive Strength               |                 | 12 lb. per sq. in.        |                                                                       |
| Manufacturing Process              |                 | Machine molded            | Machine molded                                                        |
| Resistance to Breakage in Handling |                 | Good                      | Good                                                                  |
| Dimensions                         |                 |                           |                                                                       |
| Other Qualifications               |                 |                           |                                                                       |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|              |  |                                |                                          |
|--------------|--|--------------------------------|------------------------------------------|
| CONFIDENTIAL |  | PV Supertemp<br>Eagle-Picher   | Rock Cork<br>Johns-Manville Sales Corp.  |
|              |  | Nono-Block<br>Baldwin Hill Co. | Mineral Wool Board<br>Armstrong Cork Co. |
|              |  | Armtemp<br>Armstrong Cork Co.  | Koldboard<br>Baldwin Hill Co.            |
|              |  | W F Block<br>M. H. Detrick Co. |                                          |
|              |  |                                |                                          |
|              |  |                                |                                          |
|              |  |                                |                                          |
|              |  |                                |                                          |



DUP 0960870

| Code                               | 116                                                                            | 117                            | 117.1                                                                                                                                    |
|------------------------------------|--------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Material                           | Flexible foamed plastic                                                        | Urethane Foam Resilient        | Urethane Foam Resilient                                                                                                                  |
| Material Description               | Flexible aerated resin with a closed cellular structure. Pipe and tubing only. | See Codes 117.1 through 117.5. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire-retardant additive. |
| Filler                             |                                                                                |                                |                                                                                                                                          |
| Binder                             |                                                                                |                                |                                                                                                                                          |
| Temperature Range                  | 32°F to 200°F                                                                  |                                | -100°F to +250°F                                                                                                                         |
| K Factor                           | 0.28 at 75°F                                                                   |                                | 0.30 max at 75°F                                                                                                                         |
| Density                            |                                                                                |                                | 3 to 3 1/4 lb per cu ft                                                                                                                  |
| Compressive Strength               |                                                                                |                                |                                                                                                                                          |
| Manufacturing Process              | Medium molded                                                                  |                                | Molded "snap-on" pipe and fitting covers                                                                                                 |
| Resistance to Breakage in Handling | Nonbreakable                                                                   |                                | Good                                                                                                                                     |
| Dimensions                         |                                                                                |                                |                                                                                                                                          |
| Other Qualifications               | Chemically inert and nontoxic                                                  |                                | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                     |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|              |  |  |                                      |
|--------------|--|--|--------------------------------------|
| CONFIDENTIAL |  |  | Flexfoam<br>Delaware Ins Co          |
|              |  |  | Thermax<br>Am Cellular Products, Inc |
|              |  |  |                                      |
|              |  |  |                                      |
|              |  |  |                                      |
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DUP 0960871

99)

OCTOBER 1954

Rev March 1959

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Page 13

| Code                               | 117.2                                                                                                                                                                           | 117.3                                                                                                                                                                                     | 117.4                                                                                                                                                                           |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                           | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Resilient                                                                                                                                                                   | Urethane Foam Resilient                                                                                                                                                         |
| Material Description               | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 8-oz factory-applied canvas finish. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and kraft-aluminum factory-applied vapor barrier. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 30-lb factory-applied roofing felt. |
| Filler                             |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Binder                             |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Temperature Range                  | -100°F to +250°F                                                                                                                                                                | -100°F to +250°F                                                                                                                                                                          | -100°F to +250°F                                                                                                                                                                |
| K Factor                           | 0.3 max at 75°F                                                                                                                                                                 | 0.3 max at 75°F                                                                                                                                                                           | 0.3 max at 75°F                                                                                                                                                                 |
| Density                            | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 3 to 3 1/4 lb per cu ft                                                                                                                                                                   | 3 to 3 1/4 lb per cu ft                                                                                                                                                         |
| Compressive Strength               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Manufacturing Process              | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded "snap-on" pipe and fitting covers                                                                                                                                                  | Molded "snap-on" pipe and fitting covers                                                                                                                                        |
| Resistance to Breakage in Handling | Good                                                                                                                                                                            | Good                                                                                                                                                                                      | Good                                                                                                                                                                            |
| Dimensions                         |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Other Qualifications               | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|              |                                      |  |                                      |
|--------------|--------------------------------------|--|--------------------------------------|
| CONFIDENTIAL | Flexfoam<br>Delaware Ins Co          |  | Thermax<br>Am Cellular Products, Inc |
|              | Thermax<br>Am Cellular Products, Inc |  |                                      |
|              |                                      |  |                                      |
|              |                                      |  |                                      |
|              |                                      |  |                                      |
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DUP 0960872



SH 100 M

## MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 14

Rev Oct 1959

| Code                                                                                                                                                                 | 117.3                                                                                                                                                                           | 118                                                                                                                                  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--|
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Rigid                                                                                                                  |  |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 45-lb factory-applied roofing felt. | Preformed rigid urethane foam block and pipe insulation manufactured with du Pont "Hylene" and containing a fire retardant additive. |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -200°F to +200°F                                                                                                                     |  |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.17 max at 75°F                                                                                                                     |  |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 2 to 2 1/4 lb per cu ft                                                                                                              |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded                                                                                                                               |  |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                 |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                      |  |
| Other Qualifications                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                      |  |
| CONFIDENTIAL                                                                                                                                                         | Flexfoam<br>Delaware Ins Co                                                                                                                                                     | K-Foam<br>Baldwin Hill Co                                                                                                            |  |
|                                                                                                                                                                      | Thermax<br>Am Cellular Products, Inc                                                                                                                                            |                                                                                                                                      |  |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                      |  |
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DUP 0960873

163

JUL 1959 SUP. BY

REV.

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| MATERIALS                                                                                                                                                                                                                                   |                                                             | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>-SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                           |                                                             | ISSUED<br>OCT 1954                                       | SN 100 M                                                                   |
|                                                                                                                                                                                                                                             |                                                             | REVISED<br>MARCH 1959                                    | Page 1 of 14                                                               |
| Code                                                                                                                                                                                                                                        | 101*                                                        | 102*                                                     | 103                                                                        |
| Material                                                                                                                                                                                                                                    | 85% Magnesite                                               | Calcium silicate                                         | Diatomaceous earth                                                         |
| Material Description                                                                                                                                                                                                                        | Hydrated basic magnesium carbonate<br>80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bond clay and cementing materials |
| Filler                                                                                                                                                                                                                                      | Asbestos or glass fiber                                     |                                                          |                                                                            |
| Binder                                                                                                                                                                                                                                      | Clay or other cementing materials 5% by weight              |                                                          |                                                                            |
| Temperature Range                                                                                                                                                                                                                           | 100°F to 500°F                                              | 100°F to 1200°F                                          | 500°F to 1800°F                                                            |
| K Factor                                                                                                                                                                                                                                    | 200°F = 0.4, 500°F = 0.5                                    | 500°F = 0.54 max                                         | 500°F = 0.77 max                                                           |
| Density                                                                                                                                                                                                                                     | 11-14 lb per cu ft                                          | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                         |
| Compressive Strength                                                                                                                                                                                                                        |                                                             |                                                          |                                                                            |
| Manufacturing Process                                                                                                                                                                                                                       | Machine molded or extru. Pipe mach cut on diameter.         | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                 |
| Resistance to Breakage in Handling                                                                                                                                                                                                          | Good                                                        | Good                                                     | Good                                                                       |
| Dimensions                                                                                                                                                                                                                                  | ASTM **                                                     | ASTM **                                                  | To Specification                                                           |
| Other Qualifications                                                                                                                                                                                                                        |                                                             | Good mechanical strength with low shrinkage.             |                                                                            |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                        |                                                             |                                                          |                                                                            |
| *Bonds are supplied at extra cost. Order must state "with our bonds" if not required. For 11" IPS and larger there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge. | 85% Mag<br>Phelps Carey Mfg Co                              | Calcisil<br>The Ruberoid Co                              | High Temp. No. 19<br>Phelps Carey Mfg Co                                   |
|                                                                                                                                                                                                                                             | Thermalite 85%<br>Ehrer Mag Mfg Co, Inc                     | Kaylo<br>Owens-Illinois Glass Co                         | Enduro Hi-Temp.<br>Ehrer Mag Mfg Co, Inc                                   |
|                                                                                                                                                                                                                                             | 85% Mag.<br>Johns-Manville Sales Corp                       | Thermobestos<br>Johns-Manville Sales Corp                | J/M Superex<br>Johns-Manville Sales Corp                                   |
| **New Simplified Dimensional System sponsored by ASTM                                                                                                                                                                                       | Featherweight<br>Keesby & Harrison Co                       | Trueslate<br>Munder Clark Corp                           | High Temp.<br>Keesby & Harrison Co                                         |
| ***Fiber Board Paper Products Corp                                                                                                                                                                                                          | 85% Mag<br>Munder Clark Corp                                | Caltemp<br>Pobes Ind Ins Div ***                         |                                                                            |
| † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.                                                                                                                                                 | Precision-molded<br>Pobes Ind Ins Div ***                   |                                                          |                                                                            |

DUP 0990047

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Restrictions are to be made only on approval of the authority issuing the use of this Specification.

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| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicates and asbestos fibers                      | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Bladder                                                                                                                                                              |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 13 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      | Formed and comp. on mandril. Pipe mach. cut on die                                                                                                                        |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.                                                                                                             | Alltemp<br>Phillips Carey Co                                 | Unabestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kayle 20<br>Quensell Glass Co                                |                                                                                                                                                                           |
| ** Max temp of Kayle 20 is 1800°F                                                                                                                                    |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
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|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |



DUP 0990048

REV. JUN 1958

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## MATERIALS

**MATERIAL SPECIFICATION  
SERIES 100  
PREFORMED BLOCK AND PIPE**

**THERMAL INSULATION  
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954

REVISED JULY 1959

SN 100 M

Page 1 of 14

| Code                               | 101*                                                     | 102*                                         | 103                                                                       |
|------------------------------------|----------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------|
| Material                           | 85% Magnesia                                             | Calcium silicate                             | Diatomaceous earth                                                        |
| Material Description               | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base    | Diatomaceous earth, asbestos fiber, with bar clay and cementing materials |
| Filler                             | Asbestos or glass fiber                                  |                                              |                                                                           |
| Binder                             | Clay or other cementing materials 5% by weight           |                                              |                                                                           |
| Temperature Range                  | 100°F to 500°F                                           | 100°F to 1200°F                              | 500°F to 1800°F                                                           |
| K Factor                           | 200°F - 0.4, 300°F - 0.3                                 | 500°F - 0.54 max                             | 500°F - 0.77 max                                                          |
| Density                            | 11-14 lb per cu ft                                       | 11 lb per cu ft                              | 24-27 lb per cu ft                                                        |
| Compressive Strength               |                                                          |                                              |                                                                           |
| Manufacturing Process              | Machine molded or extru. Pipe mach cut on diameter.      | Machine extruded. Pipe mach cut on diameter. | Machine molded. Pipe mach cut on diameter.                                |
| Resistance to Breakage in Handling | Good                                                     | Good                                         | Good                                                                      |
| Dimensions                         | ASTM **                                                  | ASTM **                                      | To Specification                                                          |
| Other Qualifications               |                                                          | Good mechanical strength with low shrinkage. |                                                                           |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|                                                                                                                                                         |                                           |                                           |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------|
| *Bands are supplied as extra cost. Order must state "with-out bands" if not required.                                                                   | 85% Mag<br>Phillip Carey Mfg Co           | Calcilite<br>The Ruberoid Co              | High Temp No. 19<br>Phillip Carey Mfg Co |
| For 11" IPS and larger there is an additional charge for 2-in. canvas cover. Material should be specified "without 2-in. canvas" to avoid extra charge. | Thermalite 85%<br>Ehrer Mag Mfg Co, Inc   | Keylite<br>Quincy-Corning Corp            | Enduro Hi-Temp.<br>Ehrer Mag Mfg Co, Inc |
| **New Simplified Dimensional System sponsored by ASTM                                                                                                   | 85% Mag.<br>Johns-Manville Sales Corp     | Thermobestos<br>Johns-Manville Sales Corp | J/M Superes<br>Johns-Manville Sales Corp |
| ***Fiber Board Paper Products Corp                                                                                                                      |                                           | Keytherm<br>Keesby & Morrison Co          | High Temp.<br>Keesby & Morrison Co       |
| † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.                                                             | Featherweights<br>Keesby & Morrison Co    | Tricalite<br>Mundt Clark Corp             |                                          |
|                                                                                                                                                         | 85% Mag<br>Mundt Clark Corp               | Calcomp<br>Pabco Ind Ins Div ***          |                                          |
|                                                                                                                                                         | Precision-molded<br>Pabco Ind Ins Div *** |                                           |                                          |

DUP 0990053

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority indicating the use of this Specification.



# MATERIAL SPECIFICATION - SERIES 100

Page 2

Rev July 1959

186

| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silica and asbestos fibers                         | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      | Formed and comp on mandril. Pipe mach out on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kaylo 20 is 1800°F                                                                    | Allesp<br>Phillip Carey Co                                   | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kaylo 20<br>Owens-Corning Corp                               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
| DUP 0990054                                                                                                                                                          |                                                              |                                                                                                                                                                           |



848879

1-6377

| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | ISSUED<br>OCT 1954                                       | SN 100 M<br>Page 1 of 14                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          | REVISED<br>JULY 1959                                     |                                                                            |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                | 101*                                                     | 102*                                                     | 103                                                                        |
| Material                                                                                                                                                                                                                                                                                                                                                                                                                                            | 85% Magnesite                                            | Calcium silicate                                         | Diatomaceous earth                                                         |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                                | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bentonite and cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                              | Asbestos or glass fiber                                  |                                                          |                                                                            |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                              | Clay or other cementing materials 5% by weight           |                                                          |                                                                            |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                                   | 100°F to 500°F                                           | 100°F to 1200°F                                          | 500°F to 1800°F                                                            |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1200°F - 0.1, 500°F - 0.3                                | 500°F - 0.54 max                                         | 500°F - 0.77 max                                                           |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11-14 lb per cu ft                                       | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                         |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                          |                                                                            |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                               | Machine molded or extruded. Pipe mach cut on diameter.   | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                 |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                                  | Good                                                     | Good                                                     | Good                                                                       |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                          | ASTM **                                                  | ASTM **                                                  | To Specification                                                           |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Good mechanical strength with low shrinkage.             |                                                                            |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                                |                                                          |                                                          |                                                                            |
| *Bonds are supplied at extra cost. Order must state "with or without bonds" if not required.<br>For 11" IPS and larger there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge.<br>**New Simplified Dimensional System sponsored by ASTM<br>***Fiber Board Paper Products Corp<br>† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. | 85% Mag<br>Philip Carey Mfg Co                           | Calcisite<br>The Ruberoid Co                             | High Temp No. 19<br>Philip Carey Mfg Co                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Thermasite 85%<br>Ehrer Mag Mfg Co. Inc                  | Keylo<br>Owens-Corning Corp                              | Endure Hi-Temp.<br>Ehrer Mag Mfg Co. Inc                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 85% Mag.<br>Johns-Manville Sales Corp                    | Thermobestos<br>Johns-Manville Sales Corp                | J/M Superex<br>Johns-Manville Sales Corp                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          | Keytherm<br>Keesby & Mattison Co                         | High Temp.<br>Keesby & Mattison Co                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Featherweight<br>Keesby & Mattison Co                    | Incasite<br>Mundt Clark Corp                             |                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 85% Mag<br>Mundt Clark Corp                              | Caltemp<br>Pabco Ind Ins Div ***                         |                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Precision-molded<br>Pabco Ind Ins Div ***                |                                                          |                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                                          |                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                                          |                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                                          |                                                                            |

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority governing the use of this Specification.

|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SM 100 -                                                                                                                                                             |                                                              | OCTOBER 1954                        |                                                                                                                                                                           |
| Page 2                                                                                                                                                               |                                                              | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              | Rev. July 1959                      |                                                                                                                                                                           |
| Code                                                                                                                                                                 | 104                                                          |                                     | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |                                     | Asbestos and diatomaceous earth matted                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |                                     | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating. |
| Filler                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |                                     | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |                                     | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |                                     | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |                                     | Formed and comp on mandril, Pipe mach cut on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |                                     | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                     |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                     |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.                                                                                                             | Alltemp<br>Phillip Carey Co                                  |                                     | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kaylo 30<br>Owens-Corning Corp                               |                                     |                                                                                                                                                                           |
| ** Max temp of Kaylo 30 is 1800°F                                                                                                                                    |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |



| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                             |                                                          | ISSUED<br>OCT 1954<br>REVISED<br>JULY 1959               | SN 100 M<br>Page 1 of 14                                              |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                         | 101*                                                     | 102*                                                     | 103                                                                   |
| Material -                                                                                                                                                                                                                                                                                                                                                                                                                                   | 85% Magnesite                                            | Calcium silicate                                         | Diatomaceous earth                                                    |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                         | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with portland cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                       | Asbestos or glass fiber                                  |                                                          |                                                                       |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                       | Clay or other cementing materials 5% by weight           |                                                          |                                                                       |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                            | 100°F to 300°F                                           | 100°F to 1200°F                                          | 500°F to 1800°F                                                       |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                     | 200°F - 0.4, 300°F - 0.3                                 | 500°F - 0.34 max                                         | 500°F - 0.77 max                                                      |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                      | 11-14 lb per cu ft                                       | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                    |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          |                                                          |                                                                       |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                        | Machine molded or extruded. Pipe mach cut on diameter.   | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                            |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                           | Good                                                     | Good                                                     | Good                                                                  |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                   | ASTM **                                                  | ASTM **                                                  | To Specification                                                      |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Good mechanical strength with low shrinkage.             |                                                                       |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                         |                                                          |                                                          |                                                                       |
| *Bands are supplied on extra cost. Order must state "with our bands" if not required.<br>For 11" IPS and larger there is an additional charge for 2-in canvas cover. Material should be specified "without 2-in canvas" to avoid extra charge.<br>**New Simplified Dimensional System sponsored by ASTM<br>***Fiber Board Paper Products Corp<br>† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. | 85% Mag<br>Phillip Carey Mfg Co                          | Calcisil<br>The Ruberoid Co                              | High Temp No. 19<br>Phillip Carey Mfg Co                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              | Thermalite 85%<br>Elmer Mag Mfg Co, Inc                  | Keylo<br>Quincy-Corning Corp                             | Enduro Hi-Temp.<br>Elmer Mag Mfg Co, Inc                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              | 85% Mag.<br>Johns-Manville Sales Corp                    | Thermobestos<br>Johns-Manville Sales Corp                | J/M Superes<br>Johns-Manville Sales Corp                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Kaytherm<br>Kassidy & Morrison Co                        | High Temp.<br>Kassidy & Morrison Co                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              | Featherweight<br>Kassidy & Morrison Co                   | Tricalite<br>Mundt Clark Corp                            |                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              | 85% Mag<br>Mundt Clark Corp                              | Cellamp<br>Pabco Ind Ins Div ***                         |                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              | Precision-molded<br>Pabco Ind Ins Div ***                |                                                          |                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          |                                                          |                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          |                                                          |                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          |                                                          |                                                                       |
| Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this Specification.                                                                                                                                                                                                                   |                                                          |                                                          |                                                                       |

R-171

040384

DUP 0990279

# MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 2

Rev April 1960

| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth matted                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.54 max<br>Block - 500°F - 0.58 max | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lb per cu ft                                                                                                                                                           |
| Compressive Strength                                                                                                                                                 | 65 lb per sq in. min at 5% deformation                       | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                |                                                              | Formed and come on mandrel. Pipe mach cut on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kaylo 20 is 1800°F                                                                    |                                                              | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kaylo 20                                                     |                                                                                                                                                                           |
|                                                                                                                                                                      | Quans-Corning Corp                                           |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |

DUP 0990280

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|                                                                                                                                                                     |                                                              |                                     |                                                                                                                                                                           |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Page 2                                                                                                                                                              |                                                              | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                                                           | OCTOBER 1954 |
|                                                                                                                                                                     |                                                              | Rev July 1959                       |                                                                                                                                                                           | 184          |
| Code                                                                                                                                                                | 104                                                          |                                     | 106                                                                                                                                                                       |              |
| Material                                                                                                                                                            | Inorganic silicates                                          |                                     | Asbestos and diatomaceous earth molded                                                                                                                                    |              |
| Material Description                                                                                                                                                | Inorganic silicates and asbestos fibers                      |                                     | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |              |
| Filler                                                                                                                                                              |                                                              |                                     |                                                                                                                                                                           |              |
| Binder                                                                                                                                                              |                                                              |                                     |                                                                                                                                                                           |              |
| Temperature Range                                                                                                                                                   | 100°F to 1600°F**                                            |                                     | 200°F to 1200°F                                                                                                                                                           |              |
| K Factor                                                                                                                                                            | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |                                     | 500°F - 0.54 max                                                                                                                                                          |              |
| Density                                                                                                                                                             | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     | 18 lbs per cu ft                                                                                                                                                          |              |
| Compressive Strength                                                                                                                                                | 65 lbs per sq in. min at 5% deformation                      |                                     | 11 PSI at 5% deformation - Dry                                                                                                                                            |              |
| Manufacturing Process                                                                                                                                               | Filter moulding process                                      |                                     | Formed and comp on mandril. Pipe mach cut on die                                                                                                                          |              |
| Resistance to Breakage in Handling                                                                                                                                  | Good                                                         |                                     | Good                                                                                                                                                                      |              |
| Dimensions                                                                                                                                                          |                                                              |                                     |                                                                                                                                                                           |              |
| Other Qualifications                                                                                                                                                | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers met their product meets the above specifications. |                                                              |                                     |                                                                                                                                                                           |              |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kayle 20 is 1800°F                                                                   | Alltemp<br>Phillips Carey Co                                 |                                     | Unasbestos<br>Union Asbestos & Rubber Co                                                                                                                                  |              |
|                                                                                                                                                                     | Kayle 20<br>Owens-Corning Corp                               |                                     |                                                                                                                                                                           |              |
|                                                                                                                                                                     |                                                              |                                     |                                                                                                                                                                           |              |
|                                                                                                                                                                     |                                                              |                                     |                                                                                                                                                                           |              |
|                                                                                                                                                                     |                                                              |                                     |                                                                                                                                                                           |              |
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DUP 0990282

040387

2-0-51-2

| MATERIALS                                                                                                                                                                                                                                  |                                                                           | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION   |                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                           |                                                                           | ISSUED<br>OCT 1954                                         | SN 100 M<br>Page 1 of 14                                                            |
|                                                                                                                                                                                                                                            |                                                                           | REVISED<br>JULY 1959                                       |                                                                                     |
| Code                                                                                                                                                                                                                                       | 101*                                                                      | 102*                                                       | 103                                                                                 |
| Material                                                                                                                                                                                                                                   | 85% Magnesite                                                             | Calcium silicate                                           | Diatomaceous earth                                                                  |
| Material Description                                                                                                                                                                                                                       | Hydrated basic magnesium carbonate 85% by weight minimum                  | Staple, cellular, calcined fire clay base                  | Diatomaceous earth, asbestos fiber, with b clay and cementing materials             |
| Filler                                                                                                                                                                                                                                     | Asbestos or glass fiber                                                   |                                                            |                                                                                     |
| Binder                                                                                                                                                                                                                                     | Clay or other cementing materials 5% by weight                            |                                                            |                                                                                     |
| Temperature Range                                                                                                                                                                                                                          | 100°F to 500°F                                                            | 100°F to 1200°F                                            | 500°F to 1800°F                                                                     |
| K Factor                                                                                                                                                                                                                                   | 1200°F - 0.4, 500°F - 0.3                                                 | 500°F - 0.54 max                                           | 500°F - 0.77 max                                                                    |
| Density                                                                                                                                                                                                                                    | 11-14 lb per cu ft                                                        | 11 lb per cu ft                                            | 24-27 lb per cu ft                                                                  |
| Compressive Strength                                                                                                                                                                                                                       |                                                                           |                                                            |                                                                                     |
| Manufacturing Process                                                                                                                                                                                                                      | Machine molded or extruded. Pipe mach cut on diameter.                    | Machine extruded. Pipe mach cut on diameter.               | Machine molded. Pipe cut on diameter.                                               |
| Resistance to Breakage in Handling                                                                                                                                                                                                         | Good                                                                      | Good                                                       | Good                                                                                |
| Dimensions                                                                                                                                                                                                                                 | ASTM **                                                                   | ASTM **                                                    | To Specification                                                                    |
| Other Qualifications                                                                                                                                                                                                                       |                                                                           | Good mechanical strength with low shrinkage.               |                                                                                     |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                       |                                                                           |                                                            |                                                                                     |
| *Bands are available in extra cost. Order must state "with our bands" if not required. For 11" IPS and larger there is an additional charge for 2nd corner cover. Material should be specified "without 2nd corner" to avoid extra charge. | 85% Mag<br>Phillip Carey Mfg Co<br>Thermalite 85%<br>Ehrst Mag Mfg Co Inc | Calcisite<br>The Ruberoid Co<br>Kays<br>Quana-Corning Corp | High Temp No. 19<br>Phillip Carey Mfg Co<br>Enduro Hi-Temp.<br>Ehrst Mag Mfg Co Inc |
| **New Simplified Dimensional System sponsored by ASTM                                                                                                                                                                                      | 85% Mag<br>Johns-Manville Sales Corp                                      | Thermobestos<br>Johns-Manville Sales Corp                  | J/M Super<br>Johns-Manville Sales Corp                                              |
| ***Fiber Board Paper Products Corp                                                                                                                                                                                                         | Featherlight<br>Kearby & Mattison Co                                      | Kearby<br>Kearby & Mattison Co                             | High Temp.<br>Kearby & Mattison Co                                                  |
| † Codes 104 and 106 are acceptable alternatives unless noted on the Product Specifications.                                                                                                                                                | 85% Mag<br>Munder Cork Corp                                               | Tricalite<br>Munder Cork Corp                              |                                                                                     |
|                                                                                                                                                                                                                                            | Precision-molded<br>Paces Ind Ins Div ***                                 | Calcamp<br>Paces Ind Ins Div ***                           |                                                                                     |
|                                                                                                                                                                                                                                            |                                                                           |                                                            |                                                                                     |
|                                                                                                                                                                                                                                            |                                                                           |                                                            |                                                                                     |
| Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority having the use of this Specification.                     |                                                                           |                                                            |                                                                                     |
| SUBSTITUTION *** 40-10                                                                                                                                                                                                                     |                                                                           |                                                            |                                                                                     |

NOT TO BE USED IN THE PROPERTY OF THE UNITED STATES GOVERNMENT OR ANY OTHER AGENCY AND COMPANY. THE TECHNICAL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE.

R-220

# MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 2

Rev July 1959

186

| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silica and asbestos fibers                         | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      | Formed and comp on mandril. Pipe mach out on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.                                                                                                             | Alltemp<br>Phillips Carey Co                                 | L'Asbestos<br>Union Asbestos & Rubber Co                                                                                                                                  |
|                                                                                                                                                                      | Kayle 20<br>Owens-Corning Corp                               |                                                                                                                                                                           |
| ** Max temp of Kayle 20 is 1800°F                                                                                                                                    |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |

DUP 0990367

048392

4-0-37 AA

165

| MATERIALS                                                                                                                                                            |                                                          | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                     |                                                          | REVISED<br>OCT 1984<br>REVISED<br>MARCH 1999             | SN 100 M<br>Page 1 of 14                                                  |
| Code                                                                                                                                                                 | 101*                                                     | 102*                                                     | 103                                                                       |
| Material                                                                                                                                                             | 85% Magnesia                                             | Calcium silicate                                         | Diatomaceous earth                                                        |
| Material Description                                                                                                                                                 | Hydrated basic magnesium carbonate 80% by weight minimum | Simple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bar clay and cementing materials |
| Filler                                                                                                                                                               | Asbestos or glass fiber                                  |                                                          |                                                                           |
| Binder                                                                                                                                                               | Clay or other cementing materials 5% by weight           |                                                          |                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 500°F                                           | 100°F to 1200°F                                          | 500°F to 1800°F                                                           |
| K Factor                                                                                                                                                             | 280°F = 0.4, 300°F = 0.5                                 | 500°F = 0.54 max                                         | 500°F = 0.77 max                                                          |
| Density                                                                                                                                                              | 11-14 lb per cu ft                                       | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                        |
| Compressive Strength                                                                                                                                                 |                                                          |                                                          |                                                                           |
| Manufacturing Process                                                                                                                                                | Machine molded or extru. Pipe mach cut on diameter.      | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                     | Good                                                     | Good                                                                      |
| Dimensions                                                                                                                                                           | ASTM **                                                  | ASTM **                                                  | To Specification                                                          |
| Other Qualifications                                                                                                                                                 |                                                          | Good mechanical strength with low shrinkage.             |                                                                           |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                          |                                                          |                                                                           |
| *Bands are supplied as extra cost. Order must state "with cut bands" if not required.                                                                                | 85% Mag<br>Philip Carey Mfg Co                           | Calcisil<br>The Ruberoid Co                              | High Temp. No. 19<br>Philip Carey Mfg Co                                  |
| For 11" IPS and larger there is an additional charge for 3-in. extra cover. Material should be specified "without 3-in. extra" to avoid extra charge.                | Thermalite 85%<br>Ehrer Mag Mfg Co. Inc                  | Kaylo<br>Owens-Illinois Glass Co                         | Enduro Hb Temp.<br>Ehrer Mag Mfg Co. Inc                                  |
| **New Simplified Dimensional System sponsored by ASTM                                                                                                                | 85% Mag.<br>Johns-Manville Sales Corp                    | Thermalite<br>Johns-Manville Sales Corp                  | J/M Superins.<br>Johns-Manville Sales Corp                                |
| ***Filter Board Paper Products Corp                                                                                                                                  |                                                          | Keytherm<br>Keesby & Morrison Co                         | High Temp.<br>Keesby & Morrison Co                                        |
| † Codes 184 and 186 are acceptable alternatives unless noted on the Project Specifications.                                                                          | Featherweight<br>Keesby & Morrison Co                    | Tricelins<br>Munder Clark Corp                           |                                                                           |
|                                                                                                                                                                      | 85% Mag<br>Munder Clark Corp                             | Caltemp<br>Pabco Ind Ins Div ***                         |                                                                           |
|                                                                                                                                                                      | Precision-molded<br>Pabco Ind Ins Div ***                |                                                          |                                                                           |
|                                                                                                                                                                      |                                                          |                                                          |                                                                           |
|                                                                                                                                                                      |                                                          |                                                          |                                                                           |

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Restrictions are to be made only on approval of the authority governing the use of this Specification.

STANDARD SPEC. NO. 10

R-221

DUP 0990368

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M.V. JUL 1959 SUP. BY

|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Page 2                                                                                                                                                               |                                                              | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                                                           | OCTOBER 1954    |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           | Rev. Sept. 1952 |
| Code                                                                                                                                                                 | 104                                                          |                                     | 104                                                                                                                                                                       |                 |
| Material                                                                                                                                                             | Inorganic silicates                                          |                                     | Asbestos and diatomaceous earth molded                                                                                                                                    |                 |
| Material Description                                                                                                                                                 | Inorganic silicates and asbestos fibers                      |                                     | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |                 |
| Filler                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |                 |
| Bladder                                                                                                                                                              |                                                              |                                     |                                                                                                                                                                           |                 |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |                                     | 200°F to 1200°F                                                                                                                                                           |                 |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |                                     | 500°F - 0.54 max                                                                                                                                                          |                 |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     | 18 lbs per cu ft                                                                                                                                                          |                 |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |                                     | 11 PSI at 5% deformation - Dry                                                                                                                                            |                 |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |                                     | Formed and comp. on mandril. Pipe mach. cut on die                                                                                                                        |                 |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |                                     | Good                                                                                                                                                                      |                 |
| Dimensions                                                                                                                                                           |                                                              |                                     |                                                                                                                                                                           |                 |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                     |                                                                                                                                                                           |                 |
| <ul style="list-style-type: none"> <li>Available for field mixing to repair joints and seams.</li> <li>** Max temp of Kevlar 20 is 1800°F</li> </ul>                 | Alltemp<br>Philip Carey Co                                   |                                     | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |                 |
|                                                                                                                                                                      | Kevlar 20<br>Quensell Illinois Glass Co                      |                                     |                                                                                                                                                                           |                 |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |                 |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |                 |
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DUP 0990369

048394



|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Page 2                                                                                                                                                               |                                                              | MATERIAL SPECIFICATION - SERIES 100 |  | OCTOBER 1954                                                                                                                                                              |
|                                                                                                                                                                      |                                                              |                                     |  | Rev April 1960                                                                                                                                                            |
| Code                                                                                                                                                                 | 104                                                          |                                     |  | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |                                     |  | Asbestos and diatomaceous earth maldes                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |                                     |  | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                     |  |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                     |  |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |                                     |  | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.54 max<br>Block - 500°F - 0.58 max |                                     |  | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     |  | 18 lb per cu ft                                                                                                                                                           |
| Compressive Strength                                                                                                                                                 | 65 lb per sq in. min at 5% deformation                       |                                     |  | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                |                                                              |                                     |  | Formed and cured on mandrel. Pipe mach cut on die                                                                                                                         |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |                                     |  | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                     |  |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     |  | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                     |  |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kayle 20 is 1800°F                                                                    |                                                              |                                     |  | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kayle 20                                                     |                                     |  |                                                                                                                                                                           |
|                                                                                                                                                                      | Owens-Corning Coro                                           |                                     |  |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
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DUP 0990451

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| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silices and asbestos fibers                        | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F = 0.64 max<br>Block - 500°F = 0.58 max | 500°F = 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      | Formed and cased on mandril. Pipe mach cut on die                                                                                                                         |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kayle 20 is 1800°F                                                                    | Allamp<br>Philip Carey Co                                    | Unasbestos<br>Union Asbestos & Rubber Co                                                                                                                                  |
|                                                                                                                                                                      | Kayle 20<br>Quens-Corning Corp                               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
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DUP 0990453

848478

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| MATERIALS                                                        |                                                          | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                               |
|------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE |                                                          | ISSUED<br>OCT 1954                                       | SN 100 M<br>Page 1 of 14                                                      |
|                                                                  |                                                          | REVISED<br>MARCH 1959                                    |                                                                               |
| Code                                                             | 101*                                                     | 102**                                                    | 103                                                                           |
| Material                                                         | 85% Magnesia                                             | Calcium silicate                                         | Diatomaceous earth                                                            |
| Material Description                                             | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bonding clay and cementing materials |
| Filler                                                           | Asbestos or glass fiber                                  |                                                          |                                                                               |
| Binder                                                           | Clay or other cementing materials 5% by weight           |                                                          |                                                                               |
| Temperature Range                                                | 100°F to 500°F                                           | 100°F to 1200°F                                          | 500°F to 1800°F                                                               |
| K Factor                                                         | 200°F - 0.4, 500°F - 0.3                                 | 500°F - 0.34 max                                         | 500°F - 0.77 max                                                              |
| Density                                                          | 11-14 lb per cu ft                                       | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                            |
| Compressive Strength                                             |                                                          |                                                          |                                                                               |
| Manufacturing Process                                            | Machine molded or extru. Pipe mach cut on diameter.      | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                    |
| Resistance to Breakage in Handling                               | Good                                                     | Good                                                     | Good                                                                          |
| Dimensions                                                       | ASTM **                                                  | ASTM **                                                  | To Specification                                                              |
| Other Qualifications                                             |                                                          | Good mechanical strength with low shrinkage.             |                                                                               |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|                                                                                                                                                       |                                           |                                           |                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------|
| *Bonds are supplied at extra cost. Order must state "without bonds" if not required.                                                                  | 85% Mag<br>Philip Carey Mfg Co            | Calcilite<br>The Ruberoid Co              | High Temp No. 19<br>Philip Carey Mfg Co  |
| For 11" IPS and larger there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge. | Thermalite 85%<br>Ehret Mag Mfg Co, Inc   | Kaylo<br>Owens-Illinois Glass Co          | Enduro Hi-Temp.<br>Ehret Mag Mfg Co, Inc |
|                                                                                                                                                       | 85% Mag.<br>Johns-Manville Sales Corp     | Thermabestos<br>Johns-Manville Sales Corp | J/M Superex<br>Johns-Manville Sales Corp |
|                                                                                                                                                       |                                           | Kaytherm<br>Keasby & Mattison Co          | High Temp.<br>Keasby & Mattison Co       |
| **New Simplified Dimensional System sponsored by ASTM                                                                                                 | Featherweights<br>Keasby & Mattison Co    | Tricalite<br>Mundet Cork Corp             |                                          |
| ***Fiber Board Paper Products Corp                                                                                                                    | 85% Mag<br>Mundet Cork Corp               | Caltemp<br>Pabco Ind Ins Div ***          |                                          |
| † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.                                                           | Precision-molded<br>Pabco Ind Ins Div *** |                                           |                                          |
|                                                                                                                                                       |                                           |                                           |                                          |
|                                                                                                                                                       |                                           |                                           |                                          |

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this Specification.

DUP 0990845

407

**DUP 0990845**

|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
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| SN 100 M                                                                                                                                                             |                                                              | OCTOBER 1954  |                                                                                                                                                                           |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                              |               |                                                                                                                                                                           |
| Page 2                                                                                                                                                               |                                                              | Rev Sept 1958 |                                                                                                                                                                           |
| Code                                                                                                                                                                 | 104                                                          |               | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |               | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |               | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |               | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |               | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |               | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |               | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |               | Formed and comp. on mandril. Pipe mach cut on die                                                                                                                         |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |               | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |               |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |               | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |               |                                                                                                                                                                           |
| • Available for field mixing to repair joints and seams.<br><br>** Max temp of Kayla 20 is 1800°F                                                                    | Altemp Philip Carey Co                                       |               | Unibestos Union Asbestos & Rubber Co                                                                                                                                      |
|                                                                                                                                                                      | Kayla 20 Owens-Illinois Glass Co                             |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
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408





166

REV. JUN 1954

DUP 0990846

090432

TUVV/XYZ

145

| OCTOBER 1954                                                                                                                                                         |                                                                                          |     |                                                                                            | SM 10C |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------|--------|
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                          |     |                                                                                            | Page 3 |
| Rev Sept 1958                                                                                                                                                        |                                                                                          |     |                                                                                            |        |
| Code                                                                                                                                                                 | 107                                                                                      | 108 | 109                                                                                        |        |
| Material                                                                                                                                                             | Asbestos sponge                                                                          |     | Corrugated asbestos preshrunk                                                              |        |
| Material Description                                                                                                                                                 | Asbestos sheets separated by finely ground sponged material bonded with adhesive strips. |     | Alternate layers of plain and corrugated asbestos sheets.<br>Outer covering asbestos felt. |        |
| Filler                                                                                                                                                               |                                                                                          |     |                                                                                            |        |
| Binder                                                                                                                                                               |                                                                                          |     |                                                                                            |        |
| Temperature Range                                                                                                                                                    | 100°F to 700°F                                                                           |     | 100°F to 400°F                                                                             |        |
| K Factor                                                                                                                                                             | 500°F - 0.60 max                                                                         |     | 200°F - 0.58 max                                                                           |        |
| Density                                                                                                                                                              | 30 lb max                                                                                |     |                                                                                            |        |
| Compressive Strength                                                                                                                                                 |                                                                                          |     |                                                                                            |        |
| Manufacturing Process                                                                                                                                                | Laminated - 38 to 42 layers per in. of thickness                                         |     | 3-ply laminate                                                                             |        |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                |     | Good                                                                                       |        |
| Dimensions                                                                                                                                                           | To Specification                                                                         |     |                                                                                            |        |
| Other Qualifications                                                                                                                                                 | Must be a flexible product                                                               |     | Preshrunk                                                                                  |        |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                          |     |                                                                                            |        |
| • Aircell -4-ply<br>Excel -6-ply<br>Caucel-8-ply                                                                                                                     | Asbestos Sponge<br>Johns-Manville Sales Corp                                             |     | Preshrunk Asbestocel<br>Johns-Manville Sales Corp                                          |        |
|                                                                                                                                                                      | Asbestos Sponge<br>Philip Carey Mfg Co                                                   |     | Aircell •<br>Philip Carey Mfg Co                                                           |        |
|                                                                                                                                                                      | Sponge Felt<br>The Ruberoid Co                                                           |     | K & M - Aircell<br>Keesbey & Mattison Co                                                   |        |
|                                                                                                                                                                      | Sponge Felt<br>Ehret Mfg Mfg Co, Inc                                                     |     | B-H Aircell<br>Baldwin-Hill Co                                                             |        |
|                                                                                                                                                                      | Sponge Felt<br>Smith and Kanzler Corp                                                    |     |                                                                                            |        |
|                                                                                                                                                                      |                                                                                          |     |                                                                                            |        |
|                                                                                                                                                                      |                                                                                          |     |                                                                                            |        |

DUP 0990847

409



090433

7 U V W X Y Z

| SN 100 M                                                                                                                                                             |                                                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                    |                                 | OCTOBER 1954  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------|---------------|
| Page 4                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 | Rev Sept 1958 |
| Code                                                                                                                                                                 | 110                                                                                                                                                     | 111                                                    | 112                             |               |
| Material                                                                                                                                                             | Vegetable cork                                                                                                                                          | Cellular glass                                         | Glass fiber                     |               |
| Material Description                                                                                                                                                 | Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation. | Cellular glass foamed and fused into unicellular form. | See codes 112.01 through 112.81 |               |
| Filler                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 |               |
| Binder                                                                                                                                                               | Natural resin in cork                                                                                                                                   |                                                        |                                 |               |
| Temperature Range                                                                                                                                                    | -200°F to 100°F                                                                                                                                         | -200°F to 100°F<br>(+300°F for dual temp)              |                                 |               |
| K Factor                                                                                                                                                             | 100°F - 0.29 max                                                                                                                                        | 100°F - 0.43 max                                       |                                 |               |
| Density                                                                                                                                                              | 9 - 11 lb per cu ft                                                                                                                                     | 10 - 11 lb per cu ft                                   |                                 |               |
| Compressive Strength                                                                                                                                                 | 15 lb per sq in. min                                                                                                                                    | 35 lb per sq in. min                                   |                                 |               |
| Manufacturing Process                                                                                                                                                | Machine comp or molded. Baked at moderate temp                                                                                                          |                                                        |                                 |               |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                    |                                                        |                                 |               |
| Dimensions                                                                                                                                                           |                                                                                                                                                         |                                                        |                                 |               |
| Other Qualifications                                                                                                                                                 | Pipe covering shall be coated on the outside with heavy mastic                                                                                          |                                                        |                                 |               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      | Cork<br>Armstrong Cork Co                                                                                                                               | Foamglas<br>Pittsburgh Corning Corp                    |                                 |               |
|                                                                                                                                                                      | Cork<br>Mundet Cork Co                                                                                                                                  |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
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144

R.V. 11-11-54

DUP 0990848

090434

VWXYZA: 33

| OCTOBER 1954                                                                                                                                                         |                                                                                       | MATERIAL SPECIFICATION - SERIES 100 |  | SM 100 M    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|--|-------------|
| Rev. C - 1958                                                                                                                                                        |                                                                                       |                                     |  | Page 5      |
| Code                                                                                                                                                                 | 112.01                                                                                | 112.02                              |  |             |
| Material                                                                                                                                                             | Glass fiber                                                                           | See Code 112.01                     |  |             |
| Material Description                                                                                                                                                 | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                     |  |             |
| Filler                                                                                                                                                               |                                                                                       |                                     |  |             |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                          |                                     |  |             |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                         |                                     |  |             |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                          |                                     |  |             |
| Density                                                                                                                                                              | 3" and 6" 1b per cu ft                                                                |                                     |  |             |
| Compressive Strength                                                                                                                                                 |                                                                                       |                                     |  |             |
| Manufacturing Process                                                                                                                                                | Machine-molded                                                                        |                                     |  |             |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                             |                                     |  |             |
| Dimensions                                                                                                                                                           |                                                                                       |                                     |  |             |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                        |                                     |  |             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                       |                                     |  |             |
|                                                                                                                                                                      | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                             |                                     |  | DUP 0990849 |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                           |                                     |  |             |
|                                                                                                                                                                      | *Thermoglas<br>Philip Cory Mfg Co                                                     |                                     |  |             |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                     |                                     |  |             |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                          |                                     |  |             |
|                                                                                                                                                                      | *Aerogel<br>Johns-Manville Sales Corp                                                 |                                     |  |             |
|                                                                                                                                                                      |                                                                                       |                                     |  |             |
|                                                                                                                                                                      |                                                                                       |                                     |  |             |
|                                                                                  |                                                                                       | 411                                 |  |             |

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| SN 100 M                                                                                                                                                             |                                                                                                                                                                                | OCTOBER 1954   |  |
| Page 6                                                                                                                                                               |                                                                                                                                                                                | Rev March 1959 |  |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                                                                                |                |  |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12         |  |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11     |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |                |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                |                |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                                                                                   |                |  |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |                |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |                |  |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                                                                         |                |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |                |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |                |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |                |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |                |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |                |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |                |  |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on Gustin-Bacon Mfg Co                                                                                                                                        |                |  |
|                                                                                                                                                                      | * Mono-Kover Baldwin-Hill                                                                                                                                                      |                |  |
|                                                                                                                                                                      | * Thermoglas Philip Carey Mfg Co                                                                                                                                               |                |  |
|                                                                                                                                                                      | ** Fiberglas Owens-Corning Corp                                                                                                                                                |                |  |
|                                                                                                                                                                      | ** Armaglas PF Pipe Insu Armstrong Cork Co                                                                                                                                     |                |  |
|                                                                                                                                                                      | * Aerolag Johns-Manville Sales Corp                                                                                                                                            |                |  |
|                                                                                                                                                                      | * PPG Glass Fiber Pima Plate Glass Co                                                                                                                                          |                |  |
|                                                                                                                                                                      | * Micro-Lok LOF Glass Fibers Co                                                                                                                                                |                |  |
|                                                                                                                                                                      |                                                                                                                                                                                |                |  |



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DUP 0990850

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| OCTOBER 1954                                                                                                                                                         |                                                                                               | MATERIAL SPECIFICATION - SERIES 100                                                           |  | SM 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|----------|
| Rev May 1959                                                                                                                                                         |                                                                                               |                                                                                               |  | Page 7   |
| Code                                                                                                                                                                 | 112.16                                                                                        | 112.17                                                                                        |  |          |
| Material                                                                                                                                                             | Glass fiber                                                                                   | Glass fiber                                                                                   |  |          |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish. | Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish. |  |          |
| Filler                                                                                                                                                               |                                                                                               |                                                                                               |  |          |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                  | Phenol-formaldehyde or Di-Cy                                                                  |  |          |
| Temperature Range                                                                                                                                                    | 80°F to 300°F                                                                                 | 80°F to 300°F                                                                                 |  |          |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                  | 100°F - 0.25                                                                                  |  |          |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                        | 3" and 6" lb per cu ft                                                                        |  |          |
| Compressive Strength                                                                                                                                                 |                                                                                               |                                                                                               |  |          |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                | Machine molded                                                                                |  |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                     | Very good                                                                                     |  |          |
| Dimensions                                                                                                                                                           |                                                                                               |                                                                                               |  |          |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                                | Specify whether for iron pipe or copper tubing                                                |  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                               |                                                                                               |  |          |
|                                                                                                                                                                      | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        |  |          |
|                                                                                                                                                                      | *Mono-Kover Baldwin-Hill                                                                      | *Mono-Kover Baldwin-Hill                                                                      |  |          |
|                                                                                                                                                                      | *Thermoglas Philip Carey Mfg Co                                                               | *Thermoglas Philip Carey Mfg Co                                                               |  |          |
|                                                                                                                                                                      | **Fiberglas Owens-Corning Corp                                                                | **Fiberglas Owens-Corning Corp                                                                |  |          |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu Armstrong Cork Co                                                     | **Armoglas PF Pipe Insu Armstrong Cork Co                                                     |  |          |
|                                                                                                                                                                      | *Aerogel Johns-Manville Sales Corp                                                            | *Aerogel Johns-Manville Sales Corp                                                            |  |          |
|                                                                                                                                                                      | *PPG Glass Fiber Pitts Plate Glass Co                                                         | *PPG Glass Fiber Pitts Plate Glass Co                                                         |  |          |
|                                                                                                                                                                      | *Micro-Lok J-M Fiber Glass Inc                                                                | *Micro-Lok J-M Fiber Glass Inc                                                                |  |          |
|                                                                                                                                                                      |                                                                                               |                                                                                               |  |          |

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| SN 100 M                                                                                                                                                             |                                                                                                                         | OCTOBER 1954                                                                                                            |                                                                                                                                                     |
| Page 8                                                                                                                                                               |                                                                                                                         | Rev. May 1959                                                                                                           |                                                                                                                                                     |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Code                                                                                                                                                                 | 112.21                                                                                                                  | 112.22                                                                                                                  | 112.23                                                                                                                                              |
| Material                                                                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                                                         |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with factory-applied white bleached kraft paper, laminated to the outer face of aluminum foil. |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde                                                                                                                                 |
| Temperature Range                                                                                                                                                    | 40°F to 200°F                                                                                                           | 40°F to 200°F                                                                                                           | 100°F to 250°F                                                                                                                                      |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                                                        |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                  | 3" and 6" lb per cu ft                                                                                                  | 3 lb per cu ft min                                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                                                         | Very low                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          | Machine molded                                                                                                          | Machine molded                                                                                                                                      |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               | Very good                                                                                                               | Very good                                                                                                                                           |
| Dimensions                                                                                                                                                           |                                                                                                                         |                                                                                                                         | 1/2 and 3/4 thick<br>3 ft sections                                                                                                                  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Low cost insulation for limited services such as hot water.                                                                                         |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
|                                                                                                                                                                      | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | Universal Jacket<br>Owens-Corning Corp                                                                                                              |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                                                             | *Mono-Kover<br>Baldwin-Hill                                                                                             |                                                                                                                                                     |
|                                                                                                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      |                                                                                                                                                     |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                                                       | **Fiberglas<br>Owens-Corning Corp                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            |                                                                                                                                                     |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                                                   | *Aerolag<br>Johns-Manville Sales Corp                                                                                   |                                                                                                                                                     |
|                                                                                                                                                                      | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                |                                                                                                                                                     |
|                                                                                                                                                                      | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |

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DUP 0990852

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OCTOBER 1954

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev Dec 1958

Page 9

| Code                               | 112.61                                                                                                         |  | 112.66                                                                                                                                                            |
|------------------------------------|----------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                           | Glass fiber                                                                                                    |  | Glass fiber                                                                                                                                                       |
| Material Description               | Plain semi-rigid board, formed from fibrous glass or mineral fibers.                                           |  | Short, coarse steam-blown glass fibers preformed into semi-rigid board, sanded on one side and cut into legging sizes for ease of application to curved surfaces. |
| Filler                             |                                                                                                                |  |                                                                                                                                                                   |
| Binder                             | Phenol-formaldehyde                                                                                            |  | Phenol-formaldehyde                                                                                                                                               |
| Temperature Range                  | 40°F to 350°F                                                                                                  |  | 40°F to 350°F                                                                                                                                                     |
| K Factor                           | 100°F - 0.25 to 0.30                                                                                           |  | 100°F - 0.25                                                                                                                                                      |
| Density                            | 6 and 9 lb per cu ft                                                                                           |  | 9 lb per cu ft                                                                                                                                                    |
| Compressive Strength               |                                                                                                                |  |                                                                                                                                                                   |
| Manufacturing Process              | Machine molded                                                                                                 |  | Machine molded                                                                                                                                                    |
| Resistance to Breakage in Handling | Very good                                                                                                      |  | Very good                                                                                                                                                         |
| Dimensions                         | Std 24" x 48"<br>Thickness PF615 (6-lb density) 1/2" through 3".<br>PF617 (9-lb density), 1/2" through 2 1/4". |  | Length - 36"<br>Width - 6" or 12"<br>Thickness - 3/4", 1", 1 1/4", 1 1/2", and 2".                                                                                |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|  |                                                            |  |                                                  |
|--|------------------------------------------------------------|--|--------------------------------------------------|
|  | Fiberglas PF615 or 617<br>Insulation<br>Owens-Corning Corp |  | Fiberglas Block Insulation<br>Owens-Corning Corp |
|  | Armaglas PF615 or 617<br>Insulation<br>Armstrong Cork Co   |  | Armaglas Block Insulation<br>Armstrong Cork Co   |
|  | Spintex No. 414 or 415<br>Johns-Manville Co                |  |                                                  |
|  | Spanduct<br>Baldwin-Hill Co                                |  |                                                  |
|  |                                                            |  |                                                  |
|  |                                                            |  |                                                  |

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| SN 100 M                                                                                                                                                             |                                                                                                                         | OCTOBER 1954 |                                                                                                                   |
| Page 10                                                                                                                                                              |                                                                                                                         | Rev Dec 1953 |                                                                                                                   |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |              |                                                                                                                   |
| Code                                                                                                                                                                 | 112.71                                                                                                                  |              | 112.81                                                                                                            |
| Material                                                                                                                                                             | Glass fiber                                                                                                             |              | Glass fiber                                                                                                       |
| Material Description                                                                                                                                                 | Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish. |              | Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface. |
| Filler                                                                                                                                                               |                                                                                                                         |              |                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                                     |              | Phenol-formaldehyde                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 150°F                                                                                                           |              | 40°F to 150°F                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.26                                                                                                            |              | 100°F - 0.26                                                                                                      |
| Density                                                                                                                                                              | 6 lb. per cu ft                                                                                                         |              | 6 lb per cu ft                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |              |                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          |              | Machine molded                                                                                                    |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               |              | Very good                                                                                                         |
| Dimensions                                                                                                                                                           | 24" x 48" boards<br>3/4" to 2" thickness                                                                                |              | 24" x 48" boards<br>3/8" to 2" thickness                                                                          |
| Other Qualifications                                                                                                                                                 |                                                                                                                         |              | Neoprene coating on side of board exposed to air flow                                                             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |              |                                                                                                                   |
|                                                                                                                                                                      | Fiberglas Vapor Seal Duct Ins. Owens-Corning Corp                                                                       |              | Fiberglas Coated Duct Ins. Owens-Corning Corp                                                                     |
|                                                                                                                                                                      | Armoglas Vapor Seal Duct Ins. Armstrong Cork Co                                                                         |              | Armoglas Coated Duct Ins. Armstrong Cork Co                                                                       |
|                                                                                                                                                                      | Spintex No. 414VS Johns-Manville Co                                                                                     |              | Coated Duct Insulation Baldwin-Hill Co                                                                            |
|                                                                                                                                                                      | Spandux Baldwin-Hill Co                                                                                                 |              |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |              |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |              |                                                                                                                   |
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190

DUP 0990854

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| OCTOBER 1954                                                                                                                                                         |                 | MATERIAL SPECIFICATION - SERIES 100                                                  |                                                                       | SN 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------|
| Rev. Oct. 1954                                                                                                                                                       |                 |                                                                                      |                                                                       | Page 11  |
| Code                                                                                                                                                                 | 113             | 114                                                                                  | 115                                                                   |          |
| Material                                                                                                                                                             | See Code 112.81 | Mineral wool (Block only)                                                            | Mineral wool - asphalt impregnated                                    |          |
| Material Description                                                                                                                                                 |                 | Mineral slag wool                                                                    | Mineral wool fibers homogeneously impregnated with an asphalt binder. |          |
| Filler                                                                                                                                                               |                 |                                                                                      |                                                                       |          |
| Binder                                                                                                                                                               |                 | High temp. binder                                                                    | Asphalt                                                               |          |
| Temperature Range                                                                                                                                                    |                 | 500°F to 1700°F                                                                      | -200°F to 100°F                                                       |          |
| K Factor                                                                                                                                                             |                 | 500°F - 0.45 max.                                                                    | 100°F - 0.34 max.                                                     |          |
| Density                                                                                                                                                              |                 | 19.2 lb. per cu. ft.                                                                 |                                                                       |          |
| Compressive Strength                                                                                                                                                 |                 | 12 lb. per sq. in.                                                                   |                                                                       |          |
| Manufacturing Process                                                                                                                                                |                 | Machine molded                                                                       | Machine molded                                                        |          |
| Resistance to Breakage in Handling                                                                                                                                   |                 | Good                                                                                 | Good                                                                  |          |
| Dimensions                                                                                                                                                           |                 |                                                                                      |                                                                       |          |
| Other Qualifications                                                                                                                                                 |                 |                                                                                      |                                                                       |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                 |                                                                                      |                                                                       |          |
|                                                                                                                                                                      |                 | PV Supertemp<br>Eagle-Picher                                                         | Rock Cork<br>Johns-Manville Sales Corp.                               |          |
|                                                                                                                                                                      |                 | Mono-Block<br>Baldwin Hill Co.                                                       | Mineral Wool Board<br>Armstrong Cork Co.                              |          |
|                                                                                                                                                                      |                 | Armtemp<br>Armstrong Cork Co.                                                        | Koldboard<br>Baldwin Hill Co.                                         |          |
|                                                                                                                                                                      |                 | M F Block<br>M. H. Detrick Co.                                                       |                                                                       |          |
|                                                                                                                                                                      |                 |                                                                                      |                                                                       |          |
|                                                                                                                                                                      |                 |                                                                                      |                                                                       |          |
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| SN 100 M                                                                                                                                                             |                                                                                | OCTOBER 1954                   |                                                                                                                                          |
| Page 12                                                                                                                                                              |                                                                                | Rev March 1959                 |                                                                                                                                          |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                |                                |                                                                                                                                          |
| Code                                                                                                                                                                 | 116                                                                            | 117                            | 117.1                                                                                                                                    |
| Material                                                                                                                                                             | Flexible foamed plastic                                                        | Urethane Foam Resilient        | Urethane Foam Resilient                                                                                                                  |
| Material Description                                                                                                                                                 | Flexible aerated resin with a closed cellular structure. Pipe and tubing only. | See Codes 117.1 through 117.5. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire-retardant additive. |
| Filler                                                                                                                                                               |                                                                                |                                |                                                                                                                                          |
| Binder                                                                                                                                                               |                                                                                |                                |                                                                                                                                          |
| Temperature Range                                                                                                                                                    | 32°F to 200°F                                                                  |                                | -100°F to +250°F                                                                                                                         |
| K Factor                                                                                                                                                             | 0.28 at 75°F                                                                   |                                | 0.30 max at 75°F                                                                                                                         |
| Density                                                                                                                                                              |                                                                                |                                | 3 to 3 1/4 lb per cu ft                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                |                                |                                                                                                                                          |
| Manufacturing Process                                                                                                                                                | Medium molded                                                                  |                                | Molded "snap-on" pipe and fitting covers                                                                                                 |
| Resistance to Breakage in Handling                                                                                                                                   | Nonbreakable                                                                   |                                | Good                                                                                                                                     |
| Dimensions                                                                                                                                                           |                                                                                |                                |                                                                                                                                          |
| Other Qualifications                                                                                                                                                 | Chemically inert and nontoxic                                                  |                                | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                     |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                |                                |                                                                                                                                          |
|                                                                                                                                                                      |                                                                                |                                | Flexfoam<br>Delaware Ins Co                                                                                                              |
|                                                                                                                                                                      |                                                                                |                                | Thermas<br>Am Cellular Products, Inc                                                                                                     |
|                                                                                                                                                                      |                                                                                |                                |                                                                                                                                          |
|                                                                                                                                                                      |                                                                                |                                |                                                                                                                                          |
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418

DUP 0990856

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OCTOBER 1954

Rev March 1959

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Page 13

| Code                                                                                                                                                                 | 117.2                                                                                                                                                                           | 117.3                                                                                                                                                                                     | 117.4                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Resilient                                                                                                                                                                   | Urethane Foam Resilient                                                                                                                                                         |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 8-oz factory-applied canvas finish. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and kraft-aluminum factory-applied vapor barrier. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 30-lb factory-applied roofing felt. |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -100°F to +250°F                                                                                                                                                                          | -100°F to +250°F                                                                                                                                                                |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.3 max at 75°F                                                                                                                                                                           | 0.3 max at 75°F                                                                                                                                                                 |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 3 to 3 1/4 lb per cu ft                                                                                                                                                                   | 3 to 3 1/4 lb per cu ft                                                                                                                                                         |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded "snap-on" pipe and fitting covers                                                                                                                                                  | Molded "snap-on" pipe and fitting covers                                                                                                                                        |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                                                                      | Good                                                                                                                                                                            |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Other Qualifications                                                                                                                                                 | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
|                                                                                                                                                                      | Flexfoam Delaware Ins Co                                                                                                                                                        |                                                                                                                                                                                           | Thermas Am Cellular Products, Inc                                                                                                                                               |
|                                                                                                                                                                      | Thermas Am Cellular Products, Inc                                                                                                                                               |                                                                                                                                                                                           |                                                                                                                                                                                 |
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| SN 100 M                                                                                                                                                             |                                                                                                                                                                                 | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                      | OCTOBER 1954   |  |
| Page 14                                                                                                                                                              |                                                                                                                                                                                 |                                     |                                                                                                                                      | Rev March 1959 |  |
| Code                                                                                                                                                                 | 117.5                                                                                                                                                                           |                                     | 118                                                                                                                                  |                |  |
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         |                                     | Urethane Foam Rigid                                                                                                                  |                |  |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 45-lb factory-applied roofing felt. |                                     | Preformed rigid urethane foam block and pipe insulation manufactured with du Pont "Hylene" and containing a fire retardant additive. |                |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                |                                     | -200°F to +200°F                                                                                                                     |                |  |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 |                                     | 0.17 max at 75°F                                                                                                                     |                |  |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         |                                     | 2 to 2 1/4 lb per cu ft                                                                                                              |                |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        |                                     | Molded                                                                                                                               |                |  |
| Resistance to Breakage & Handling                                                                                                                                    | Good                                                                                                                                                                            |                                     | Good                                                                                                                                 |                |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
| Other Qualifications                                                                                                                                                 |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
|                                                                                                                                                                      | Flexfoam<br>Delaware Ins Co                                                                                                                                                     | Gemfoam<br>Texas Foam Plastics      |                                                                                                                                      |                |  |
|                                                                                                                                                                      | Thermax<br>Am Cellular Products, Inc                                                                                                                                            |                                     |                                                                                                                                      |                |  |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |
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|  <span style="float: right; font-size: 1.2em;">420</span>                         |                                                                                                                                                                                 |                                     |                                                                                                                                      |                |  |

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| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                          | THERMAL INSULATION                           |                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | STANDARD ENGINEERING SPECIFICATION           |                                                                               |
| SERIES 100                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | ISSUED OCT 1954                              | SN 100 M                                                                      |
| PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | REVISED JULY 1959                            | Page 1 of 14                                                                  |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                      | 101*                                                     | 102*                                         | 103                                                                           |
| Material                                                                                                                                                                                                                                                                                                                                                                                                                                  | 85% Magnesia                                             | Calcium silicate                             | Diatomaceous earth                                                            |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                      | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base    | Diatomaceous earth, asbestos fiber, with bonding clay and cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                    | Asbestos or glass fiber                                  |                                              |                                                                               |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                    | Clay or other cementing materials 5% by weight           |                                              |                                                                               |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                         | 100°F to 500°F                                           | 100°F to 1200°F                              | 500°F to 1800°F                                                               |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                  | 200°F - 0.4, 300°F - 0.5                                 | 500°F - 0.54 max                             | 500°F - 0.77 max                                                              |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                   | 11-14 lb per cu ft                                       | 11 lb per cu ft                              | 24-27 lb per cu ft                                                            |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          |                                              |                                                                               |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                     | Machine molded or extru. Pipe mach cut on diameter.      | Machine extruded. Pipe mach cut on diameter. | Machine molded. Pipe mach cut on diameter.                                    |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                        | Good                                                     | Good                                         | Good                                                                          |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                | ASTM **                                                  | ASTM **                                      | To Specification                                                              |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | Good mechanical strength with low shrinkage. |                                                                               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                      |                                                          |                                              |                                                                               |
| *Bonds are supplied at extra cost. Order must state "without bonds" if not required.<br>For 11" IPS and larger there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge.<br>**New Simplified Dimensional System sponsored by ASTM<br>***Fiber Board Paper Products Corp<br>† Codes 104 and 106 are acceptable alternates unless noted on the Project Specifications. | 85% Mag<br>Philip Carey Mfg Co                           | Calcisite<br>The Ruberoid Co                 | High Temp No. 19<br>Philip Carey Mfg Co                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Thermalite 85%<br>Ehret Mag Mfg Co, Inc                  | Kaylo<br>Owens-Corning Corp                  | Enduro Hi-Temp.<br>Ehret Mag Mfg Co, Inc                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 85% Mag.<br>Johns-Manville Sales Corp                    | Thermobestos<br>Johns-Manville Sales Corp    | I/M Superes<br>Johns-Manville Sales Corp                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          | Kaytherm<br>Keasby & Mattison Co             | High Temp.<br>Keasby & Mattison Co                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Featherweight<br>Keasby & Mattison Co                    | Tricalite<br>Mundet Cork Corp                |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | 85% Mag<br>Mundet Cork Corp                              | Caltemp<br>Pabco Ind Ins Div ***             |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           | Precision-molded<br>Pabco Ind Ins Div ***                |                                              |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                              |                                                                               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                              |                                                                               |
| Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this Specification.                                                                                                                                                                                                                |                                                          |                                              |                                                                               |

SUBCOMMITTEE NO. 28



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| SN 100 M                                                                                                                                                             |                                                              | OCTOBER 1954  |                                                                                                                                                                           |
| Page 2                                                                                                                                                               |                                                              | Rev July 1959 |                                                                                                                                                                           |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                              |               |                                                                                                                                                                           |
| Code                                                                                                                                                                 | 104                                                          |               | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |               | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |               | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |               | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |               | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |               | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |               | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |               | Formed and comp on mandril. Pipe mach cut on dia                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |               | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |               |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |               | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |               |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kaylo 20 is 1800°F                                                                    | Alltemp<br>Philip Carey Co                                   |               | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kaylo 20<br>Owens-Corning Corp                               |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
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| 422                                                                                                                                                                  |                                                              |               |                                                                                                                                                                           |



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T U V W X Y Z A E:

145

| OCTOBER 1954                                                                                                                                                            |                                                                                                   | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                     | SM 100 M |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------|----------|
| Rev Sept 1958                                                                                                                                                           |                                                                                                   |                                     |                                                                                                     | Page 3   |
| Code                                                                                                                                                                    | 107                                                                                               | 108                                 | 109                                                                                                 |          |
| Material                                                                                                                                                                | Asbestos sponge                                                                                   |                                     | Corrugated asbestos<br>prashrunk                                                                    |          |
| Material Description                                                                                                                                                    | Asbestos sheets separated<br>by finely ground sponged<br>material bonded with<br>adhesive strips. |                                     | Alternate layers of plain<br>and corrugated asbestos<br>sheets.<br>Outer covering asbestos<br>felt. |          |
| Filler                                                                                                                                                                  |                                                                                                   |                                     |                                                                                                     |          |
| Binder                                                                                                                                                                  |                                                                                                   |                                     |                                                                                                     |          |
| Temperature<br>Range                                                                                                                                                    | 100°F to 700°F                                                                                    |                                     | 100°F to 400°F                                                                                      |          |
| K Factor                                                                                                                                                                | 500°F - 0.60 max                                                                                  |                                     | 200°F - 0.58 max                                                                                    |          |
| Density                                                                                                                                                                 | 30 lb max                                                                                         |                                     |                                                                                                     |          |
| Compressive<br>Strength                                                                                                                                                 |                                                                                                   |                                     |                                                                                                     |          |
| Manufacturing<br>Process                                                                                                                                                | Laminated - 38 to 42<br>layers per in. of thickness                                               |                                     | 3-ply laminate                                                                                      |          |
| Resistance to Breakage<br>in Handling                                                                                                                                   | Very good                                                                                         |                                     | Good                                                                                                |          |
| Dimensions                                                                                                                                                              | To Specification                                                                                  |                                     |                                                                                                     |          |
| Other<br>Qualifications                                                                                                                                                 | Must be a flexible product                                                                        |                                     | Prashrunk                                                                                           |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that<br>their product meets the above specifications. |                                                                                                   |                                     |                                                                                                     |          |
| • <i>Aircell</i> -4-ply<br><i>Excel</i> -6-ply<br><i>Cavocel</i> -8-ply                                                                                                 | Asbestos Sponge<br>Johns-Manville Sales Corp                                                      |                                     | Prashrunk Asbestoscel<br>Johns-Manville Sales Corp                                                  |          |
|                                                                                                                                                                         | Asbestos Sponge<br>Philip Carey Mfg Co                                                            |                                     | Aircell •<br>Philip Carey Mfg Co                                                                    |          |
|                                                                                                                                                                         | Sponge Felt<br>The Rubensoid Co                                                                   |                                     | K & M - Aircell<br>Keesbey & Mattison Co                                                            |          |
|                                                                                                                                                                         | Sponge Felt<br>Ehret Mfg Mfg Co, Inc                                                              |                                     | B-H Aircell<br>Baldwin Hill Co                                                                      |          |
|                                                                                                                                                                         | Sponge Felt<br>Smith and Kanzler Corp                                                             |                                     |                                                                                                     |          |
|                                                                                                                                                                         |                                                                                                   |                                     |                                                                                                     |          |
|                                                                                                                                                                         |                                                                                                   |                                     |                                                                                                     |          |
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| 423                                                                                                                                                                     |                                                                                                   |                                     |                                                                                                     |          |
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DUP 0990861

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V V W X Y Z A B C

| OCTOBER 1954                                                                                                                                                         |                                                                                       | MATERIAL SPECIFICATION - SERIES 100 |  | SN 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|--|----------|
| Rev Dec 1950                                                                                                                                                         |                                                                                       |                                     |  | Page 5   |
| Code                                                                                                                                                                 | 112.01                                                                                | 112.02                              |  |          |
| Material                                                                                                                                                             | Glass fiber                                                                           | See Code 112.01                     |  |          |
| Material Description                                                                                                                                                 | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                     |  |          |
| Filler                                                                                                                                                               |                                                                                       |                                     |  |          |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                          |                                     |  |          |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                         |                                     |  |          |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                          |                                     |  |          |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                |                                     |  |          |
| Compressive Strength                                                                                                                                                 |                                                                                       |                                     |  |          |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                        |                                     |  |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                             |                                     |  |          |
| Dimensions                                                                                                                                                           |                                                                                       |                                     |  |          |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                        |                                     |  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                       |                                     |  |          |
|                                                                                                                                                                      | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                |                                     |  |          |
|                                                                                                                                                                      | *Mono-Kover Baldwin-Hill                                                              |                                     |  |          |
|                                                                                                                                                                      | *Thermoglas Philip Cory Mfg Co                                                        |                                     |  |          |
|                                                                                                                                                                      | **Fiberglas Owens-Corning Corp                                                        |                                     |  |          |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu Armstrong Cork Co                                             |                                     |  |          |
|                                                                                                                                                                      | *Aerogel Johns-Manville Sales Corp                                                    |                                     |  |          |
|                                                                                                                                                                      |                                                                                       |                                     |  |          |
|                                                                                                                                                                      |                                                                                       |                                     |  |          |
| 425                                                                                                                                                                  |                                                                                       |                                     |  |          |

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| SN 100 M                                                                                                                                                             |                                                                                                                                                                                | MATERIAL SPECIFICATION - SERIES 100 |  | OCTOBER 1954   |
| Page 6                                                                                                                                                               |                                                                                                                                                                                |                                     |  | Rev March 1959 |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12                              |  |                |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11                          |  |                |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |                                     |  |                |
| Filler                                                                                                                                                               |                                                                                                                                                                                |                                     |  |                |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                                                                                   |                                     |  |                |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |                                     |  |                |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |                                     |  |                |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                                                                         |                                     |  |                |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |                                     |  |                |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |                                     |  |                |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |                                     |  |                |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |                                     |  |                |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |                                     |  |                |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |                                     |  |                |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on Gustin-Bacon Mfg Co                                                                                                                                        |                                     |  |                |
|                                                                                                                                                                      | * Mono-Kover Baldwin-Hill                                                                                                                                                      |                                     |  |                |
|                                                                                                                                                                      | * Thermoglas Philip Corey Mfg Co                                                                                                                                               |                                     |  |                |
|                                                                                                                                                                      | ** Fiberglas Owens-Corning Corp                                                                                                                                                |                                     |  |                |
|                                                                                                                                                                      | ** Armaglas PF Pipe Insu Armstrong Cork Co                                                                                                                                     |                                     |  |                |
|                                                                                                                                                                      | * Aerolag Johns-Manville Sales Corp                                                                                                                                            |                                     |  |                |
|                                                                                                                                                                      | * PPG Glass Fiber Pitts Plate Glass Co                                                                                                                                         |                                     |  |                |
|                                                                                                                                                                      | * Micro-Lok LOF Glass Fibers Co                                                                                                                                                |                                     |  |                |
|                                                                                                                                                                      |                                                                                                                                                                                |                                     |  |                |
| 426                                                                               |                                                                                                                                                                                |                                     |  |                |

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DUP 0990864

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| OCTOBER 1954                                                                                                                                                         |                                                                                               |                                                                                               |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                               |                                                                                               |  |
| Rev. May 1939                                                                                                                                                        |                                                                                               |                                                                                               |  |
| Page 7                                                                                                                                                               |                                                                                               |                                                                                               |  |
| Code                                                                                                                                                                 | 112.16                                                                                        | 112.17                                                                                        |  |
| Material                                                                                                                                                             | Glass fiber                                                                                   | Glass fiber                                                                                   |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber banded pipe insulation with 4-oz factory-applied canvas finish. | Textile type fine glass fiber banded pipe insulation with 3-oz factory-applied canvas finish. |  |
| Filler                                                                                                                                                               |                                                                                               |                                                                                               |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                  | Phenol-formaldehyde or Di-Cy                                                                  |  |
| Temperature Range                                                                                                                                                    | 80°F to 300°F                                                                                 | 80°F to 300°F                                                                                 |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                  | 100°F - 0.25                                                                                  |  |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                        | 3" and 6" lb per cu ft                                                                        |  |
| Compressive Strength                                                                                                                                                 |                                                                                               |                                                                                               |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                | Machine molded                                                                                |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                     | Very good                                                                                     |  |
| Dimensions                                                                                                                                                           |                                                                                               |                                                                                               |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                                | Specify whether for iron pipe or copper tubing                                                |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                               |                                                                                               |  |
|                                                                                                                                                                      | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        |  |
|                                                                                                                                                                      | *Mono-Kover Baldwin-Hill                                                                      | *Mono-Kover Baldwin-Hill                                                                      |  |
|                                                                                                                                                                      | *Thermaglas Philip Carey Mfg Co                                                               | *Thermaglas Philip Carey Mfg Co                                                               |  |
|                                                                                                                                                                      | **Fiberglas Owens-Corning Corp                                                                | **Fiberglas Owens-Corning Corp                                                                |  |
|                                                                                                                                                                      | **Armoglas PF Pipe Ins Armstrong Cork Co                                                      | **Armoglas PF Pipe Ins Armstrong Cork Co                                                      |  |
|                                                                                                                                                                      | *Aeroglas Johns-Manville Sales Corp                                                           | *Aeroglas Johns-Manville Sales Corp                                                           |  |
|                                                                                                                                                                      | *PPG Glass Fiber Pima Plate Glass Co                                                          | *PPG Glass Fiber Pima Plate Glass Co                                                          |  |
|                                                                                                                                                                      | *Micro-Lab J-M Fiber Glass Inc                                                                | *Micro-Lab J-M Fiber Glass Inc                                                                |  |
|                                                                                                                                                                      |                                                                                               |                                                                                               |  |

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090451

XYZ 2L E3

| SN 100 M                                                                                                                                                             |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
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| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Page 1                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| OCTOBER 1954                                                                                                                                                         |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Rev May 1959                                                                                                                                                         |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Code                                                                                                                                                                 | 112.21                                                                                                                  | 112.22                                                                                                                  | 112.23                                                                                                                                              |
| Material                                                                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                                                         |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with factory-applied white bleached kraft paper, laminated to the outer face of aluminum foil. |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde                                                                                                                                 |
| Temperature Range                                                                                                                                                    | 40°F to 200°F                                                                                                           | 40°F to 200°F                                                                                                           | 100°F to 250°F                                                                                                                                      |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                                                        |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                  | 3" and 6" lb per cu ft                                                                                                  | 3 lb per cu ft min                                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                                                         | Very low                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          | Machine molded                                                                                                          | Machine molded                                                                                                                                      |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               | Very good                                                                                                               | Very good                                                                                                                                           |
| Dimensions                                                                                                                                                           |                                                                                                                         |                                                                                                                         | 1/2 and 3/4 thick<br>3 ft sections                                                                                                                  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Low cost insulation for limited services such as hot water.                                                                                         |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
|                                                                                                                                                                      | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | Universal Jacket<br>Owens-Corning Corp                                                                                                              |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                                                             | *Mono-Kover<br>Baldwin-Hill                                                                                             |                                                                                                                                                     |
|                                                                                                                                                                      | *Thermoglas<br>Phillip Carey Mfg Co                                                                                     | *Thermoglas<br>Phillip Carey Mfg Co                                                                                     |                                                                                                                                                     |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                                                       | **Fiberglas<br>Owens-Corning Corp                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            |                                                                                                                                                     |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                                                   | *Aerolag<br>Johns-Manville Sales Corp                                                                                   |                                                                                                                                                     |
|                                                                                                                                                                      | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                |                                                                                                                                                     |
|                                                                                                                                                                      | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |

428



114

DUP 0990866

090452

OCTOBER 1954

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev July 1959

Page 9

| Code                                                                                                                                                                 | 112.61                                                                                                         | 112.66                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Glass fiber                                                                                                    | Glass fiber                                                                                                                                                       |
| Material Description                                                                                                                                                 | Plain semi-rigid board, formed from fibrous glass or mineral fibers.                                           | Short, coarse steam-blown glass fibers preformed into semi-rigid board, sanded on one side and cut into lagging sizes for ease of application to curved surfaces. |
| Filler                                                                                                                                                               |                                                                                                                |                                                                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                            | Phenol-formaldehyde                                                                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 350°F                                                                                                  | 40°F to 350°F                                                                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.25 to 0.30                                                                                           | 100°F - 0.25                                                                                                                                                      |
| Density                                                                                                                                                              | 6 and 9 lb per cu ft                                                                                           | 9 lb per cu ft                                                                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                |                                                                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                 | Machine molded                                                                                                                                                    |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                      | Very good                                                                                                                                                         |
| Dimensions                                                                                                                                                           | Std 24" x 48"<br>Thickness PF615 (6-lb density) 1/2" through 3".<br>PF617 (9-lb density), 1/2" through 2 1/4". | Length - 36"<br>Width - 6" or 12"<br>Thickness - 3/4", 1", 1 1/4", 1 1/2", and 2".                                                                                |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                |                                                                                                                                                                   |
|                                                                                                                                                                      | Fiberglas PF615 or 617<br>Insulation<br>Owens-Corning Corp                                                     | Fiberglas Block Insulation<br>Owens-Corning Corp                                                                                                                  |
|                                                                                                                                                                      | Armatemp Spun Wool<br>Duct - Plain<br>Armstrong Cork Co                                                        | Armoglas Block Insulation<br>Armstrong Cork Co                                                                                                                    |
|                                                                                                                                                                      | Spintex No. 414 or 415<br>Johns-Manville Co                                                                    |                                                                                                                                                                   |
|                                                                                                                                                                      | Spanduct<br>Baldwin-Hill Co                                                                                    |                                                                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                |                                                                                                                                                                   |
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| 429                                                                                                                                                                  |                                                                                                                |                                                                                                                                                                   |



DUP 0990867

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| SM 100 M                                                                                                                                                             |                                                                                                                         | OCTOBER 1954                                                                        |                                                                                                                   |
| Page 10                                                                                                                                                              |                                                                                                                         | Rev July 1959                                                                       |                                                                                                                   |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |                                                                                     |                                                                                                                   |
| Code                                                                                                                                                                 | 112.71                                                                                                                  |                                                                                     | 112.81                                                                                                            |
| Material                                                                                                                                                             | Glass fiber                                                                                                             |                                                                                     | Glass fiber                                                                                                       |
| Material Description                                                                                                                                                 | Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish. |                                                                                     | Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface. |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                     |                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                                     |                                                                                     | Phenol-formaldehyde                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 150°F                                                                                                           |                                                                                     | 40°F to 150°F                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.26                                                                                                            |                                                                                     | 100°F - 0.26                                                                                                      |
| Density                                                                                                                                                              | 6 lb per cu ft                                                                                                          |                                                                                     | 6 lb per cu ft                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                     |                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          |                                                                                     | Machine molded                                                                                                    |
| Resistance to Breakage Handling                                                                                                                                      | Very good                                                                                                               |                                                                                     | Very good                                                                                                         |
| Dimensions                                                                                                                                                           | 24" x 48" boards<br>3/4" to 2" thickness                                                                                |                                                                                     | 24" x 48" boards<br>3/8" to 2" thickness                                                                          |
| Other Qualifications                                                                                                                                                 |                                                                                                                         |                                                                                     | Neoprene casting on side of board exposed to air flow                                                             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                     |                                                                                                                   |
|                                                                                                                                                                      | Fiberglas Vapor Seal Duct Insu Owens-Corning Corp                                                                       |                                                                                     | Fiberglas Coated Duct Insu Owens-Corning Corp                                                                     |
|                                                                                                                                                                      | Armstrong Spun Seal Duct - Faced VB Armstrong Cork Co                                                                   |                                                                                     | Armstrong Spun Seal Duct - Coated Armstrong Cork Co                                                               |
|                                                                                                                                                                      | Spinex No. 414 VS Johns-Manville Co                                                                                     |                                                                                     | Coated Duct Insulation Baldwin-Hill Co                                                                            |
|                                                                                                                                                                      | Spunduct Baldwin-Hill Co                                                                                                |                                                                                     |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |                                                                                     |                                                                                                                   |
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| 430                                                                                                                                                                  |                                                                                                                         |  |                                                                                                                   |



188

DUP 0990868

090454

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| OCTOBER 1954                                                                                                                                                         |                 | MATERIAL SPECIFICATION - SERIES 100 |                                                                       | SN 100 M    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------|-----------------------------------------------------------------------|-------------|
| Rev. Oct. 1954                                                                                                                                                       |                 |                                     |                                                                       | Page 11     |
| Code                                                                                                                                                                 | 113             | 114                                 | 115                                                                   |             |
| Material                                                                                                                                                             | See Code 112.81 | Mineral wool (Block only)           | Mineral wool - asphalt impregnated                                    |             |
| Material Description                                                                                                                                                 |                 | Mineral slag wool                   | Mineral wool fibers homogeneously impregnated with an asphalt binder. |             |
| Filler                                                                                                                                                               |                 |                                     |                                                                       |             |
| Binder                                                                                                                                                               |                 | High temp. binder                   | Asphalt                                                               |             |
| Temperature Range                                                                                                                                                    |                 | 500°F to 1700°F                     | -200°F to 100°F                                                       |             |
| K Factor                                                                                                                                                             |                 | 500°F - 0.45 max.                   | 100°F - 0.34 max.                                                     |             |
| Density                                                                                                                                                              |                 | 19.2 lb. per cu. ft.                |                                                                       |             |
| Compressive Strength                                                                                                                                                 |                 | 12 lb. per sq. in.                  |                                                                       |             |
| Manufacturing Process                                                                                                                                                |                 | Machine molded                      | Machine molded                                                        |             |
| Resistance to Breakage in Handling                                                                                                                                   |                 | Good                                | Good                                                                  |             |
| Dimensions                                                                                                                                                           |                 |                                     |                                                                       |             |
| Other Qualifications                                                                                                                                                 |                 |                                     |                                                                       |             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                 |                                     |                                                                       |             |
|                                                                                                                                                                      |                 | PV Superemp<br>Eagle-Picher         | Rock Cork<br>Johns-Manville Sales Corp.                               | DUP 0990869 |
|                                                                                                                                                                      |                 | Mono-Block<br>Baldwin Hill Co.      | Mineral Wool Board<br>Armstrong Cork Co.                              |             |
|                                                                                                                                                                      |                 | Armazemp<br>Armstrong Cork Co.      | Koldboard<br>Baldwin Hill Co.                                         |             |
|                                                                                                                                                                      |                 | M F Block<br>M. H. Detrick Co.      |                                                                       |             |
|                                                                                                                                                                      |                 |                                     |                                                                       |             |
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431



090455

SN 100 M

Page 12

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Rev March 1959

| Code                                                                                                                                                                 | 116                                                                            | 117                            | 117.1                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Flexible foamed plastic                                                        | Urethane Foam Resilient        | Urethane Foam Resilient                                                                                                                  |
| Material Description                                                                                                                                                 | Flexible aerated resin with a closed cellular structure. Pipe and tubing only. | See Codes 117.1 through 117.5. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire-retardant additive. |
| Filler                                                                                                                                                               |                                                                                |                                |                                                                                                                                          |
| Binder                                                                                                                                                               |                                                                                |                                |                                                                                                                                          |
| Temperature Range                                                                                                                                                    | 32°F to 200°F                                                                  |                                | -100°F to +250°F                                                                                                                         |
| K Factor                                                                                                                                                             | 0.28 at 75°F                                                                   |                                | 0.30 max at 75°F                                                                                                                         |
| Density                                                                                                                                                              |                                                                                |                                | 3 to 3 1/4 lb per cu ft                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                |                                |                                                                                                                                          |
| Manufacturing Process                                                                                                                                                | Medium molded                                                                  |                                | Molded "snap-on" pipe and fitting covers                                                                                                 |
| Resistance to Breakage in Handling                                                                                                                                   | Nonbreakable                                                                   |                                | Good                                                                                                                                     |
| Dimensions                                                                                                                                                           |                                                                                |                                |                                                                                                                                          |
| Other Qualifications                                                                                                                                                 | Chemically inert and nontoxic                                                  |                                | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                     |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                |                                |                                                                                                                                          |
|                                                                                                                                                                      |                                                                                |                                | Fleasfoam Delaware Ins Co                                                                                                                |
|                                                                                                                                                                      |                                                                                |                                | Thermax Am Cellular Products, Inc                                                                                                        |
|                                                                                                                                                                      |                                                                                |                                |                                                                                                                                          |
|                                                                                                                                                                      |                                                                                |                                |                                                                                                                                          |
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432

148

DUP 0990870

090456

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OCTOBER 1954

Rev March 1959

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Page 13

| Code                                                                                                                                                            | 117.2                                                                                                                                                                           | 117.3                                                                                                                                                                                     | 117.4                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                        | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Resilient                                                                                                                                                                   | Urethane Foam Resilient                                                                                                                                                         |
| Material Description                                                                                                                                            | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 8-oz factory-applied canvas finish. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and kraft-aluminum factory-applied vapor barrier. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 30-lb factory-applied roofing felt. |
| Filler                                                                                                                                                          |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Binder                                                                                                                                                          |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Temperature Range                                                                                                                                               | -100°F to +250°F                                                                                                                                                                | -100°F to +250°F                                                                                                                                                                          | -100°F to +250°F                                                                                                                                                                |
| K Factor                                                                                                                                                        | 0.3 max at 75°F                                                                                                                                                                 | 0.3 max at 75°F                                                                                                                                                                           | 0.3 max at 75°F                                                                                                                                                                 |
| Density                                                                                                                                                         | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 3 to 3 1/4 lb per cu ft                                                                                                                                                                   | 3 to 3 1/4 lb per cu ft                                                                                                                                                         |
| Compressive Strength                                                                                                                                            |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Manufacturing Process                                                                                                                                           | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded "snap-on" pipe and fitting covers                                                                                                                                                  | Molded "snap-on" pipe and fitting covers                                                                                                                                        |
| Resistance to Breakage in Handling                                                                                                                              | Good                                                                                                                                                                            | Good                                                                                                                                                                                      | Good                                                                                                                                                                            |
| Dimensions                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Other Qualifications                                                                                                                                            | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
|                                                                                                                                                                 | Flexfoam<br>Doleware Ins Co                                                                                                                                                     |                                                                                                                                                                                           | Thermas<br>Am Cellular Products, Inc                                                                                                                                            |
|                                                                                                                                                                 | Thermas<br>Am Cellular Products, Inc                                                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |
|                                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
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DUP 0990871



SN 100 M

## MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 14

Rev March 1959

170

| Code                                                                                                                                                                 | 117.5                                                                                                                                                                           | 118                                                                                                                                  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--|
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Rigid                                                                                                                  |  |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 45-lb factory-applied roofing felt. | Preformed rigid urethane foam block and pipe insulation manufactured with du Pont "Hylene" and containing a fire retardant additive. |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -200°F to +200°F                                                                                                                     |  |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.17 max at 75°F                                                                                                                     |  |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 2 to 2 1/4 lb per cu ft                                                                                                              |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded                                                                                                                               |  |
| Resistance to Breakage : Handling                                                                                                                                    | Good                                                                                                                                                                            | Good                                                                                                                                 |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                      |  |
| Other Qualifications                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                      |  |
|                                                                                                                                                                      | Flexfoam<br>Delaware Ins Co                                                                                                                                                     | Gemfoam<br>Texas Foam Plastics                                                                                                       |  |
|                                                                                                                                                                      | Thermax<br>Am Cellular Products, Inc                                                                                                                                            |                                                                                                                                      |  |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                      |  |
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434



DUP 0990872

090458

| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                           |                                                             | ISSUED OCT 1954<br>REVISED JULY 1959                     | SN 100 M<br>Page 1 of 14                                                      |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                       | 101*                                                        | 102*                                                     | 103                                                                           |
| Material                                                                                                                                                                                                                                                                                                                                                                                                                                   | 85% Magnesia                                                | Calcium silicate                                         | Diatomaceous earth                                                            |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                       | Hydrated basic magnesium carbonate<br>80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bonding clay and cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                     | Asbestos or glass fiber                                     |                                                          |                                                                               |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                     | Clay or other cementing materials 5% by weight              |                                                          |                                                                               |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                          | 100°F to 500°F                                              | 100°F to 1200°F                                          | 500°F to 1800°F                                                               |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                   | 200°F - 0.4, 500°F - 0.5                                    | 500°F - 0.54 max                                         | 500°F - 0.77 max                                                              |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11-14 lb per cu ft                                          | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                            |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |                                                          |                                                                               |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                      | Machine molded or extru. Pipe mach cut on diameter.         | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                    |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                         | Good                                                        | Good                                                     | Good                                                                          |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                 | ASTM **                                                     | ASTM **                                                  | To Specification                                                              |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             | Good mechanical strength with low shrinkage.             |                                                                               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                       |                                                             |                                                          |                                                                               |
| *Bands are supplied at extra cost. Order must state "with-out bands" if not required.<br>For 11" IPS and larger there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge.<br>**New Simplified Dimensional System sponsored by ASTM<br>***Fiber Board Paper Products Corp<br>† Codes 104 and 106 are acceptable alternates unless noted on the Project Specifications. | 85% Mag<br>Philip Carey Mfg Co                              | Calcisil<br>The Ruberoid Co                              | High Temp No. 19<br>Philip Carey Mfg Co                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            | Thermalise 85%<br>Ehret Mag Mfg Co. Inc                     | Kaylo<br>Owens-Corning Corp                              | Endura H-Temp.<br>Ehret Mag Mfg Co. Inc                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            | 85% Mag.<br>Johns-Manville Sales Corp                       | Thermobestos<br>Johns-Manville Sales Corp                | I/M Supares<br>Johns-Manville Sales Corp                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             | Kaytherm<br>Keasby & Mattison Co                         | High Temp.<br>Keasby & Mattison Co                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            | Featherweight<br>Keasby & Mattison Co                       | Tricalise<br>Munder Cork Corp                            |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            | 85% Mag<br>Munder Cork Corp                                 | Caltemp<br>Pabco Ind Ins Div ***                         |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            | Precision-molded<br>Pabco Ind Ins Div ***                   |                                                          |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |                                                          |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |                                                          |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |                                                          |                                                                               |
| Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority instituting the use of this Specification.                                                                                                                                                                                                                |                                                             |                                                          |                                                                               |

435

SUBCOMMITTEE NO. 18



DUP 0990873

090459

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YZ 11 E5

|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SN 100 M                                                                                                                                                             |                                                              | OCTOBER 1954                        |                                                                                                                                                                           |
| Page 2                                                                                                                                                               |                                                              | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              | Rev July 1959                       |                                                                                                                                                                           |
| Code                                                                                                                                                                 | 104                                                          |                                     | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |                                     | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |                                     | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |                                     | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |                                     | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |                                     | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |                                     | Formed and comp on mandril. Pipe mach cut on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |                                     | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                     |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                     |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.                                                                                                             | Alltemp<br>Philip Carey Co                                   |                                     | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kaylo 20<br>Owens-Corning Corp                               |                                     |                                                                                                                                                                           |
| ** Max temp of Kaylo 20 is 1800°F                                                                                                                                    |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |
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| 436                                                                                                                                                                  |                                                              |                                     |                                                                                                                                                                           |



186

DUP 0990874

090460

145

**DUP 0990875**

090461

T U V W X Y Z A B C

| SN 100 M                                                                                                                                                             |                                                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                    |                                 | OCTOBER 1954    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------|-----------------|
| Page 4                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 | Rev. Sept. 1952 |
| Code                                                                                                                                                                 | 110                                                                                                                                                     | 111                                                    | 112                             |                 |
| Material                                                                                                                                                             | Vegetable cork                                                                                                                                          | Cellular glass                                         | Glass fiber                     |                 |
| Material Description                                                                                                                                                 | Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation. | Cellular glass foamed and fused into unicellular form. | See codes 112.01 through 112.81 |                 |
| Filler                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 |                 |
| Binder                                                                                                                                                               | Natural resin in cork                                                                                                                                   |                                                        |                                 |                 |
| Temperature Range                                                                                                                                                    | -200°F to 100°F                                                                                                                                         | -200°F to 100°F<br>(+300°F for dual temp.)             |                                 |                 |
| K Factor                                                                                                                                                             | 100°F - 0.29 max                                                                                                                                        | 100°F - 0.43 max                                       |                                 |                 |
| Density                                                                                                                                                              | 9 - 11 lb per cu ft                                                                                                                                     | 10 - 11 lb per cu ft                                   |                                 |                 |
| Compressive Strength                                                                                                                                                 | 15 lb per sq in. min                                                                                                                                    | 35 lb per sq in. min                                   |                                 |                 |
| Manufacturing Process                                                                                                                                                | Machine comp. or molded.<br>Baked at moderate temp.                                                                                                     |                                                        |                                 |                 |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                    |                                                        |                                 |                 |
| Dimensions                                                                                                                                                           |                                                                                                                                                         |                                                        |                                 |                 |
| Other Qualifications                                                                                                                                                 | Pipe covering shall be coated on the outside with heavy mastic                                                                                          |                                                        |                                 |                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                         |                                                        |                                 |                 |
|                                                                                                                                                                      | Cork<br>Armstrong Cork Co                                                                                                                               | Foamglas<br>Pittsburgh Corning Corp                    |                                 |                 |
|                                                                                                                                                                      | Cork<br>Mundet Cork Co                                                                                                                                  |                                                        |                                 |                 |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |                 |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |                 |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |                 |
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146

REV. 10-1-54

DUP 0990876

438



090462

V V V X Y Z A I E E

| OCTOBER 1954                                                                                                                                                        |                                                                                       | MATERIAL SPECIFICATION - SERIES 100                                                 |  | SN 100 M    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|-------------|
| Rev Dec 1953                                                                                                                                                        |                                                                                       |                                                                                     |  | Page 5      |
| Code                                                                                                                                                                | 112.01                                                                                | 112.02                                                                              |  |             |
| Material                                                                                                                                                            | Glass fiber                                                                           | See Code 112.01                                                                     |  |             |
| Material Description                                                                                                                                                | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                                                                     |  |             |
| Filler                                                                                                                                                              |                                                                                       |                                                                                     |  |             |
| Binder                                                                                                                                                              | Phenol-formaldehyde or Di-Cy                                                          |                                                                                     |  |             |
| Temperature Range                                                                                                                                                   | 80°F to 350°F                                                                         |                                                                                     |  |             |
| K Factor                                                                                                                                                            | 100°F - 0.25                                                                          |                                                                                     |  |             |
| Density                                                                                                                                                             | 3" and 6" lb per cu ft                                                                |                                                                                     |  |             |
| Compressive Strength                                                                                                                                                |                                                                                       |                                                                                     |  |             |
| Manufacturing Process                                                                                                                                               | Machine molded                                                                        |                                                                                     |  |             |
| Resistance to Breakage in Handling                                                                                                                                  | Very good                                                                             |                                                                                     |  |             |
| Dimensions                                                                                                                                                          |                                                                                       |                                                                                     |  |             |
| Other Qualifications                                                                                                                                                | Specify whether for iron pipe or copper tubing                                        |                                                                                     |  |             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers met their product meets the above specifications. |                                                                                       |                                                                                     |  |             |
|                                                                                                                                                                     | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                             |                                                                                     |  | DUP 0990877 |
|                                                                                                                                                                     | *Mono-Kover<br>Baldwin-Hill                                                           |                                                                                     |  |             |
|                                                                                                                                                                     | *Thermoglas<br>Philip Cory Mfg Co                                                     |                                                                                     |  |             |
|                                                                                                                                                                     | **Fiberglas<br>Owens-Corning Corp                                                     |                                                                                     |  |             |
|                                                                                                                                                                     | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                          |                                                                                     |  |             |
|                                                                                                                                                                     | *Aerogel<br>Johns-Manville Sales Corp                                                 |                                                                                     |  |             |
|                                                                                                                                                                     |                                                                                       |                                                                                     |  |             |
|                                                                                                                                                                     |                                                                                       |                                                                                     |  |             |
| 439                                                                                                                                                                 |                                                                                       |  |  |             |

090463

Z A A B3

| M 100 M                                                                                                                                                              |                                                                                                                                                                                | OCTOBER 1954                        |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--|
| Page 6                                                                                                                                                               |                                                                                                                                                                                | MATERIAL SPECIFICATION - SERIES 100 |  |
|                                                                                                                                                                      |                                                                                                                                                                                | Rev Oct 1959                        |  |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12                              |  |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11                          |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber banded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |                                     |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                |                                     |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                                                                                   |                                     |  |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |                                     |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |                                     |  |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                                                                         |                                     |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |                                     |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |                                     |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |                                     |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |                                     |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |                                     |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |                                     |  |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                                                                                     |                                     |  |
|                                                                                                                                                                      | * Mono-Kover<br>Baldwin-Hill                                                                                                                                                   |                                     |  |
|                                                                                                                                                                      | * Thermoglas<br>Phillip Carey Mfg Co                                                                                                                                           |                                     |  |
|                                                                                                                                                                      | * Fiberglas<br>Owens-Corning Corp                                                                                                                                              |                                     |  |
|                                                                                                                                                                      | * Armaglas PF Pipe Insu<br>Armstrong Cork Co                                                                                                                                   |                                     |  |
|                                                                                                                                                                      | * Aerolag<br>Johns-Manville Sales Corp                                                                                                                                         |                                     |  |
|                                                                                                                                                                      | * PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                                                                      |                                     |  |
|                                                                                                                                                                      | * Micro-Lab<br>J-M Fiber Glass, Inc                                                                                                                                            |                                     |  |
|                                                                                                                                                                      |                                                                                                                                                                                |                                     |  |

410



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XYZ AA EE

|                                                                                                                                                                      |                                                                                               |                                                                                               |  |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|----------|
| OCTOBER 1954                                                                                                                                                         |                                                                                               | MATERIAL SPECIFICATION - SERIES 100                                                           |  | SM 100 M |
| Rev May 1959                                                                                                                                                         |                                                                                               |                                                                                               |  | Page 7   |
| Code                                                                                                                                                                 | 112.16                                                                                        | 112.17                                                                                        |  |          |
| Material                                                                                                                                                             | Glass fiber                                                                                   | Glass fiber                                                                                   |  |          |
| Material Description                                                                                                                                                 | Textile type fine glass fiber banded pipe insulation with 4-oz factory-applied canvas finish. | Textile type fine glass fiber banded pipe insulation with 8-oz factory-applied canvas finish. |  |          |
| Filler                                                                                                                                                               |                                                                                               |                                                                                               |  |          |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                  | Phenol-formaldehyde or Di-Cy                                                                  |  |          |
| Temperature Range                                                                                                                                                    | 80°F to 300°F                                                                                 | 80°F to 300°F                                                                                 |  |          |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                  | 100°F - 0.25                                                                                  |  |          |
| Density                                                                                                                                                              | 3" and 6" 1b per cu ft                                                                        | 3" and 6" 1b per cu ft                                                                        |  |          |
| Compressive Strength                                                                                                                                                 |                                                                                               |                                                                                               |  |          |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                | Machine molded                                                                                |  |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                     | Very good                                                                                     |  |          |
| Dimensions                                                                                                                                                           |                                                                                               |                                                                                               |  |          |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                                | Specify whether for iron pipe or copper tubing                                                |  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                               |                                                                                               |  |          |
|                                                                                                                                                                      | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        |  |          |
|                                                                                                                                                                      | *Yone-Kover Baldwin-Hill                                                                      | *Yone-Kover Baldwin-Hill                                                                      |  |          |
|                                                                                                                                                                      | *Thermoglas Philip Carey Mfg Co                                                               | *Thermoglas Philip Carey Mfg Co                                                               |  |          |
|                                                                                                                                                                      | **Fiberglas Owens-Corning Corp                                                                | **Fiberglas Owens-Corning Corp                                                                |  |          |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu Armstrong Cork Co                                                     | **Armoglas PF Pipe Insu Armstrong Cork Co                                                     |  |          |
|                                                                                                                                                                      | *Aerolag Johns-Manville Sales Corp                                                            | *Aerolag Johns-Manville Sales Corp                                                            |  |          |
|                                                                                                                                                                      | *PPG Glass Fiber Pima Plate Glass Co                                                          | *PPG Glass Fiber Pima Plate Glass Co                                                          |  |          |
|                                                                                                                                                                      | *Micro-Lab J-M Fiber Glass Inc                                                                | *Micro-Lab J-M Fiber Glass Inc                                                                |  |          |
|                                                                                                                                                                      |                                                                                               |                                                                                               |  |          |

DUP 0990879

XYZ AAE

SM 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

Page 8

Rev May 1959

| Code                                                                                                                                                                 | 112.21                                                                                                                  | 112.22                                                                                                                  | 112.23                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                                                         |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with factory-applied white bleached kraft paper, laminated to the outer face of aluminum foil. |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde                                                                                                                                 |
| Temperature Range                                                                                                                                                    | 40°F to 200°F                                                                                                           | 40°F to 200°F                                                                                                           | 100°F to 250°F                                                                                                                                      |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                                                        |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                  | 3" and 6" lb per cu ft                                                                                                  | 3 lb per cu ft min                                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                                                         | Very low                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          | Machine molded                                                                                                          | Machine molded                                                                                                                                      |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               | Very good                                                                                                               | Very good                                                                                                                                           |
| Dimensions                                                                                                                                                           |                                                                                                                         |                                                                                                                         | 1/2 and 3/4 thick<br>3 ft sections                                                                                                                  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Low cost insulation for limited services such as hot water.                                                                                         |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
|                                                                                                                                                                      | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | Universal Jacket<br>Owens-Corning Corp                                                                                                              |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                                                             | *Mono-Kover<br>Baldwin-Hill                                                                                             |                                                                                                                                                     |
|                                                                                                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      |                                                                                                                                                     |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                                                       | **Fiberglas<br>Owens-Corning Corp                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      | **Armoglas PF Pipe Insul<br>Armstrong Cork Co                                                                           | **Armoglas PF Pipe Insul<br>Armstrong Cork Co                                                                           |                                                                                                                                                     |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                                                   | *Aerolag<br>Johns-Manville Sales Corp                                                                                   |                                                                                                                                                     |
|                                                                                                                                                                      | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                |                                                                                                                                                     |
|                                                                                                                                                                      | *Micro-Lab<br>J-M Fiber Glass Inc                                                                                       | *Micro-Lab<br>J-M Fiber Glass Inc                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |

442



442



114

DUP 0990880

090466

OCTOBER 1954

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev July 1959

Page 9

| Code                               | 112.61                                                                                                         |  | 112.66                                                                                                                                                            |
|------------------------------------|----------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                           | Glass fiber                                                                                                    |  | Glass fiber                                                                                                                                                       |
| Material Description               | Plain semi-rigid board, formed from fibrous glass or mineral fibers.                                           |  | Short, coarse steam-blown glass fibers preformed into semi-rigid board, sanded on one side and cut into lagging sizes for ease of application to curved surfaces. |
| Filler                             |                                                                                                                |  |                                                                                                                                                                   |
| Binder                             | Phenol-formaldehyde                                                                                            |  | Phenol-formaldehyde                                                                                                                                               |
| Temperature Range                  | 40°F to 350°F                                                                                                  |  | 40°F to 350°F                                                                                                                                                     |
| K Factor                           | 100°F - 0.25 to 0.30                                                                                           |  | 100°F - 0.25                                                                                                                                                      |
| Density                            | 6 and 9 lb per cu ft                                                                                           |  | 9 lb per cu ft                                                                                                                                                    |
| Compressive Strength               |                                                                                                                |  |                                                                                                                                                                   |
| Manufacturing Process              | Machine molded                                                                                                 |  | Machine molded                                                                                                                                                    |
| Resistance to Breakage in Handling | Very good                                                                                                      |  | Very good                                                                                                                                                         |
| Dimensions                         | Std 24" x 48"<br>Thickness PF615 (6-lb density) 1/2" through 3".<br>PF617 (9-lb density), 1/2" through 2 1/4". |  | Length - 36"<br>Width - 6" or 12"<br>Thickness - 3/4", 1", 1 1/4", 1 1/2", and 2".                                                                                |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|  |                                                            |  |                                                  |
|--|------------------------------------------------------------|--|--------------------------------------------------|
|  | Fiberglas PF615 or 617<br>Insulation<br>Owens-Corning Corp |  | Fiberglas Block Insulation<br>Owens-Corning Corp |
|  | Armtemp Spun Eool<br>Duct - Plain<br>Armstrong Cork Co     |  | Armaglas Block Insulation<br>Armstrong Cork Co   |
|  | Spintex No. 414 or 415<br>Johns-Manville Co                |  |                                                  |
|  | Spunduct<br>Baldwin-Hill Co                                |  |                                                  |
|  |                                                            |  |                                                  |
|  |                                                            |  |                                                  |
|  |                                                            |  |                                                  |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|
| SN 100 M                                                                                                                                                             |                                                                                                                         | OCTOBER 1954  |                                                                                                                   |
| Page 10                                                                                                                                                              |                                                                                                                         | Rev July 1959 |                                                                                                                   |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |               |                                                                                                                   |
| Code                                                                                                                                                                 | 112.71                                                                                                                  |               | 112.81                                                                                                            |
| Material                                                                                                                                                             | Glass fiber                                                                                                             |               | Glass fiber                                                                                                       |
| Material Description                                                                                                                                                 | Banded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish. |               | Banded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface. |
| Filler                                                                                                                                                               |                                                                                                                         |               |                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                                     |               | Phenol-formaldehyde                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 150°F                                                                                                           |               | 40°F to 150°F                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.26                                                                                                            |               | 100°F - 0.26                                                                                                      |
| Density                                                                                                                                                              | 6 lb per cu ft                                                                                                          |               | 6 lb per cu ft                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |               |                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          |               | Machine molded                                                                                                    |
| Resistance to Breakage Handling                                                                                                                                      | Very good                                                                                                               |               | Very good                                                                                                         |
| Dimensions                                                                                                                                                           | 24" x 48" boards<br>3/4" to 2" thickness                                                                                |               | 24" x 48" boards<br>3/8" to 2" thickness                                                                          |
| Other Qualifications                                                                                                                                                 |                                                                                                                         |               | Neoprene coating on side of board exposed to air flow                                                             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |               |                                                                                                                   |
|                                                                                                                                                                      | Fiberglas Vapor Seal Duct Insu Owens-Corning Corp                                                                       |               | Fiberglas Coated Duct Insu Owens-Corning Corp                                                                     |
|                                                                                                                                                                      | Armtemp Spun Wool Duct - Faced V8 Armstrong Cork Co                                                                     |               | Armtemp Spun Wool Duct - Coated Armstrong Cork Co                                                                 |
|                                                                                                                                                                      | Spintex No. 414VS Johns-Manville Co                                                                                     |               | Coated Duct Insulation Baldwin-Hill Co                                                                            |
|                                                                                                                                                                      | Spunduct Baldwin-Hill Co                                                                                                |               |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |               |                                                                                                                   |
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| OCTOBER 1954                                                                                                                                                         |                 | MATERIAL SPECIFICATION - SERIES 100                                                 |                                                                       | SN 100 M |
| Rev. Oct. 1954                                                                                                                                                       |                 |                                                                                     |                                                                       | Page 11  |
| Code                                                                                                                                                                 | 113             | 114                                                                                 | 115                                                                   |          |
| Material                                                                                                                                                             | See Code 112.81 | Mineral wool (Black only)                                                           | Mineral wool - asphalt impregnated                                    |          |
| Material Description                                                                                                                                                 |                 | Mineral slag wool                                                                   | Mineral wool fibers homogeneously impregnated with an asphalt binder. |          |
| Filler                                                                                                                                                               |                 |                                                                                     |                                                                       |          |
| Binder                                                                                                                                                               |                 | High temp. binder                                                                   | Asphalt                                                               |          |
| Temperature Range                                                                                                                                                    |                 | 500°F to 1700°F                                                                     | -200°F to 100°F                                                       |          |
| K Factor                                                                                                                                                             |                 | 500°F - 0.45 max.                                                                   | 100°F - 0.34 max.                                                     |          |
| Density                                                                                                                                                              |                 | 19.2 lb. per cu. ft.                                                                |                                                                       |          |
| Compressive Strength                                                                                                                                                 |                 | 12 lb. per sq. in.                                                                  |                                                                       |          |
| Manufacturing Process                                                                                                                                                |                 | Machine molded                                                                      | Machine molded                                                        |          |
| Resistance to Breakage in Handling                                                                                                                                   |                 | Good                                                                                | Good                                                                  |          |
| Dimensions                                                                                                                                                           |                 |                                                                                     |                                                                       |          |
| Other Qualifications                                                                                                                                                 |                 |                                                                                     |                                                                       |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                 |                                                                                     |                                                                       |          |
|                                                                                                                                                                      |                 | PV Supertemp<br>Eagle-Picher                                                        | Rock Cork<br>Johns-Manville Sales Corp.                               |          |
|                                                                                                                                                                      |                 | Mono-Block<br>Baldwin Hill Co.                                                      | Mineral Wool Board<br>Armstrong Cork Co.                              |          |
|                                                                                                                                                                      |                 | Armastemp<br>Armstrong Cork Co.                                                     | Koldboa<br>Baldwin Hill Co.                                           |          |
|                                                                                                                                                                      |                 | M F Block<br>M. H. Detrick Co.                                                      |                                                                       |          |
|                                                                                                                                                                      |                 |                                                                                     |                                                                       |          |
|                                                                                                                                                                      |                 |                                                                                     |                                                                       |          |
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| 445                                                                                                                                                                  |                 |  |                                                                       |          |

DUP 0990883

SN 100 M

Page 12

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Rev March 1959

| Code                                                                                                                                                                        | 116                                                                            | 117                            | 117.1                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                                    | Flexible foamed plastic                                                        | Urethane Foam Resilient        | Urethane Foam Resilient                                                                                                                  |
| Material Description                                                                                                                                                        | Flexible aerated resin with a closed cellular structure. Pipe and tubing only. | See Codes 117.1 through 117.5. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire-retardant additive. |
| Filler                                                                                                                                                                      |                                                                                |                                |                                                                                                                                          |
| Binder                                                                                                                                                                      |                                                                                |                                |                                                                                                                                          |
| Temperature Range                                                                                                                                                           | 32°F to 200°F                                                                  |                                | -100°F to +250°F                                                                                                                         |
| K Factor                                                                                                                                                                    | 0.28 at 75°F                                                                   |                                | 0.30 max at 75°F                                                                                                                         |
| Density                                                                                                                                                                     |                                                                                |                                | 3 to 3 1/4 lb per cu ft                                                                                                                  |
| Compressive Strength                                                                                                                                                        |                                                                                |                                |                                                                                                                                          |
| Manufacturing Process                                                                                                                                                       | Medium molded                                                                  |                                | Molded "snap-on" pipe and fitting covers                                                                                                 |
| Resistance to Breakage in Handling                                                                                                                                          | Nonbreakable                                                                   |                                | Good                                                                                                                                     |
| Dimensions                                                                                                                                                                  |                                                                                |                                |                                                                                                                                          |
| Other Qualifications                                                                                                                                                        | Chemically inert and nontoxic                                                  |                                | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                     |
| <p>The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.</p> |                                                                                |                                |                                                                                                                                          |
|                                                                                                                                                                             |                                                                                |                                | Flexfoam Delaware Ins Co                                                                                                                 |
|                                                                                                                                                                             |                                                                                |                                | Thermax Am Cellular Products, Inc                                                                                                        |
|                                                                                                                                                                             |                                                                                |                                |                                                                                                                                          |
|                                                                                                                                                                             |                                                                                |                                |                                                                                                                                          |
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DUP 0990884

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OCTOBER 1954

Rev March 1959

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Page 13

| Code                                                                                                                                                                 | 117.2                                                                                                                                                                           | 117.3                                                                                                                                                                                     | 117.4                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Resilient                                                                                                                                                                   | Urethane Foam Resilient                                                                                                                                                         |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 8-oz factory-applied canvas finish. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and kraft-aluminum factory-applied vapor barrier. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 30-lb factory-applied roofing felt. |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -100°F to +250°F                                                                                                                                                                          | -100°F to +250°F                                                                                                                                                                |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.3 max at 75°F                                                                                                                                                                           | 0.3 max at 75°F                                                                                                                                                                 |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 3 to 3 1/4 lb per cu ft                                                                                                                                                                   | 3 to 3 1/4 lb per cu ft                                                                                                                                                         |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded "snap-on" pipe and fitting covers                                                                                                                                                  | Molded "snap-on" pipe and fitting covers                                                                                                                                        |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                                                                      | Good                                                                                                                                                                            |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Other Qualifications                                                                                                                                                 | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
|                                                                                                                                                                      | Flexfoam<br>Deleware Ins Co                                                                                                                                                     |                                                                                                                                                                                           | Thermas<br>Am Cellular Products, Inc                                                                                                                                            |
|                                                                                                                                                                      | Thermas<br>Am Cellular Products, Inc                                                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |
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| SN 100 M                                                                                                                                                             |                                                                                                                                                                                 | MATERIAL SPECIFICATION - SERIES 100                                                                                                  |  | OCTOBER 1954 |
| Page 14                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                      |  | Rev Oct 1959 |
| Code                                                                                                                                                                 | 117.5                                                                                                                                                                           | 118                                                                                                                                  |  |              |
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Rigid                                                                                                                  |  |              |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 45-lb factory-applied roofing felt. | Preformed rigid urethane foam block and pipe insulation manufactured with du Pont "Hylene" and containing a fire retardant additive. |  |              |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -200°F to +200°F                                                                                                                     |  |              |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.17 max at 75°F                                                                                                                     |  |              |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 2 to 2 1/4 lb per cu ft                                                                                                              |  |              |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded                                                                                                                               |  |              |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                 |  |              |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Other Qualifications                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                      |  |              |
|                                                                                                                                                                      | Flexfoam<br>Deleware Ins Co                                                                                                                                                     | K-Foam<br>Baldwin Hill Co                                                                                                            |  |              |
|                                                                                                                                                                      | Thermax<br>Am Cellular Products, Inc                                                                                                                                            |                                                                                                                                      |  |              |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                      |  |              |
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| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                            |                                                          | ISSUED<br>OCT 1954                                       | SN 100 M<br>Page 1 of 14                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | REVISED<br>JULY 1959                                     |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                          |                                                                               |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                        | 101*                                                     | 102*                                                     | 103                                                                           |
| Material                                                                                                                                                                                                                                                                                                                                                                                                                                    | 85% Magnesia                                             | Calcium silicate                                         | Diatomaceous earth                                                            |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                        | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bonding clay and cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                      | Asbestos or glass fiber                                  |                                                          |                                                                               |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                      | Clay or other cementing materials 5% by weight           |                                                          |                                                                               |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                           | 100°F to 500°F                                           | 100°F to 1200°F                                          | 500°F to 1800°F                                                               |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                    | 200°F - 0.4, 500°F - 0.5                                 | 500°F - 0.54 max                                         | 500°F - 0.77 max                                                              |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11-14 lb per cu ft                                       | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                            |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          |                                                          |                                                                               |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                       | Machine molded or extru. Pipe mach cut on diameter.      | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                    |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                          | Good                                                     | Good                                                     | Good                                                                          |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                  | ASTM **                                                  | ASTM **                                                  | To Specification                                                              |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          | Good mechanical strength with low shrinkage.             |                                                                               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                        |                                                          |                                                          |                                                                               |
| *Bands are supplied at extra cost. Order must state "without bands" if not required.<br>For 11" IPS and larger there is an additional charge for 2-oz canvas cover. Material should be specified "without 2-oz canvas" to avoid extra charge.<br>**New Simplified Dimensional System sponsored by ASTM<br>***Fiber Board Paper Products Corp<br>† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. | 85% Mag<br>Philip Carey Mfg Co                           | Calcisil<br>The Ruberoid Co                              | High Temp No. 19<br>Philip Carey Mfg Co                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             | Thermalise 85%<br>Ehret Mag Mfg Co, Inc                  | Kaylo<br>Owens-Corning Corp                              | Enduro Hi-Temp.<br>Ehret Mag Mfg Co, Inc                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             | 85% Mag.<br>Johns-Manville Sales Corp                    | Thermobestos<br>Johns-Manville Sales Corp                | J/M Superes<br>Johns-Manville Sales Corp                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Kaytherm<br>Kasby & Mattison Co                          | High Temp.<br>Kasby & Mattison Co                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             | Featherweight<br>Kasby & Mattison Co                     | Tricelise<br>Mundet Cork Corp                            |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             | 85% Mag<br>Mundet Cork Corp                              | Caltemp<br>Pabco Ind Ins Div ***                         |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             | Precision-molded<br>Pabco Ind Ins Div ***                |                                                          |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                          |                                                                               |
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140

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this Specification.



SUBCOMMITTEE -3. 25

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| SM 100 M                                                                                                                                                             |                                                              | OCTOBER 1954  |                                                                                                                                                                           |
| Page 2                                                                                                                                                               |                                                              | Rev July 1959 |                                                                                                                                                                           |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                              |               |                                                                                                                                                                           |
| Code                                                                                                                                                                 | 104                                                          |               | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |               | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |               | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |               | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |               | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |               | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |               | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |               | Formed and comp on mandril. Pipe mach cut on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |               | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |               |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |               | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |               |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kevlar 20 is 1300°F                                                                   | Alltemp<br>Philip Carey Co                                   |               | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kevlar 20<br>Owens-Corning Corp                              |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
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| OCTOBER 1954                                                                                                                                                         |                                                                                          | MATERIAL SPECIFICATION - SERIES 100 |                                                                                            | SN 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------|----------|
| Rev Sept 1958                                                                                                                                                        |                                                                                          |                                     |                                                                                            | Page 3   |
| Code                                                                                                                                                                 | 107                                                                                      | 108                                 | 109                                                                                        |          |
| Material                                                                                                                                                             | Asbestos sponge                                                                          |                                     | Corrugated asbestos preshrunk                                                              |          |
| Material Description                                                                                                                                                 | Asbestos sheets separated by finely ground sponged material bonded with adhesive strips. |                                     | Alternate layers of plain and corrugated asbestos sheets.<br>Outer covering asbestos felt. |          |
| Filler                                                                                                                                                               |                                                                                          |                                     |                                                                                            |          |
| Binder                                                                                                                                                               |                                                                                          |                                     |                                                                                            |          |
| Temperature Range                                                                                                                                                    | 100°F to 700°F                                                                           |                                     | 100°F to 400°F                                                                             |          |
| K Factor                                                                                                                                                             | 500°F - 0.60 max                                                                         |                                     | 200°F - 0.58 max                                                                           |          |
| Density                                                                                                                                                              | 30 lb max                                                                                |                                     |                                                                                            |          |
| Compressive Strength                                                                                                                                                 |                                                                                          |                                     |                                                                                            |          |
| Manufacturing Process                                                                                                                                                | Laminated - 38 to 42 layers per in. of thickness                                         |                                     | 3-ply laminate                                                                             |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                |                                     | Good                                                                                       |          |
| Dimensions                                                                                                                                                           | To Specification                                                                         |                                     |                                                                                            |          |
| Other Qualifications                                                                                                                                                 | Must be a flexible product                                                               |                                     | Preshrunk                                                                                  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                          |                                     |                                                                                            |          |
| * Aircell -4-ply<br>Excel -4-ply<br>Cavocel-8-ply                                                                                                                    | Asbestos Sponge<br>Johns-Manville Sales Corp                                             |                                     | Preshrunk Asbestoscel<br>Johns-Manville Sales Corp                                         |          |
|                                                                                                                                                                      | Asbestos Sponge<br>Philip Carey Mfg Co                                                   |                                     | Aircell<br>Philip Carey Mfg Co                                                             |          |
|                                                                                                                                                                      | Sponge Felt<br>The Rubensoid Co                                                          |                                     | K & M - Aircell<br>Kearney & Mettison Co                                                   |          |
|                                                                                                                                                                      | Sponge Felt<br>Ehrst Mfg Mfg Co, Inc                                                     |                                     | B-H Aircell<br>Baldwin Hill Co                                                             |          |
|                                                                                                                                                                      | Sponge Felt<br>Smith and Kensler Corp                                                    |                                     |                                                                                            |          |
|                                                                                                                                                                      |                                                                                          |                                     |                                                                                            |          |
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T U V W X Y Z A A E E

| SN 100 M                                                                                                                                                             |                                                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                    |                                 | OCTOBER 1954  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------|---------------|
| Page 4                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 | Rev Sept 1952 |
| Code                                                                                                                                                                 | 110                                                                                                                                                     | 111                                                    | 112                             |               |
| Material                                                                                                                                                             | Vegetable cork                                                                                                                                          | Cellular glass                                         | Glass fiber                     |               |
| Material Description                                                                                                                                                 | Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation. | Cellular glass foamed and fused into unicellular form. | See codes 112.01 through 112.81 |               |
| Filler                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 |               |
| Binder                                                                                                                                                               | Natural resin in cork                                                                                                                                   |                                                        |                                 |               |
| Temperature Range                                                                                                                                                    | -200°F to 100°F                                                                                                                                         | -200°F to 100°F<br>(+300°F for dual temp)              |                                 |               |
| K Factor                                                                                                                                                             | 100°F - 0.29 max                                                                                                                                        | 100°F - 0.43 max                                       |                                 |               |
| Density                                                                                                                                                              | 9 - 11 lb per cu ft                                                                                                                                     | 10 - 11 lb per cu ft                                   |                                 |               |
| Compressive Strength                                                                                                                                                 | 15 lb per sq in. min                                                                                                                                    | 35 lb per sq in. min                                   |                                 |               |
| Manufacturing Process                                                                                                                                                | Machine comp or molded. Baked at moderate temp                                                                                                          |                                                        |                                 |               |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                    |                                                        |                                 |               |
| Dimensions                                                                                                                                                           |                                                                                                                                                         |                                                        |                                 |               |
| Other Qualifications                                                                                                                                                 | Pipe covering shall be coated on the outside with heavy mastic                                                                                          |                                                        |                                 |               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      | Cork<br>Armstrong Cork Co                                                                                                                               | Foamglas<br>Pittsburgh Corning Corp                    |                                 |               |
|                                                                                                                                                                      | Cork<br>Mundt Cork Co                                                                                                                                   |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
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452



146

REV. 10-54

DUP 0990890

090476

V W X Y Z A! B

| OCTOBER 1954                                                                                                                                                         |                                                                                       | MATERIAL SPECIFICATION - SERIES 100 |  | SN 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|--|----------|
| Rev Dec 1958                                                                                                                                                         |                                                                                       |                                     |  | Page 5   |
| Code                                                                                                                                                                 | 112.01                                                                                | 112.02                              |  |          |
| Material                                                                                                                                                             | Glass fiber                                                                           | See Code 112.01                     |  |          |
| Material Description                                                                                                                                                 | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                     |  |          |
| Filler                                                                                                                                                               |                                                                                       |                                     |  |          |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                          |                                     |  |          |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                         |                                     |  |          |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                          |                                     |  |          |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                |                                     |  |          |
| Compressive Strength                                                                                                                                                 |                                                                                       |                                     |  |          |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                        |                                     |  |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                             |                                     |  |          |
| Dimensions                                                                                                                                                           |                                                                                       |                                     |  |          |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                        |                                     |  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                       |                                     |  |          |
|                                                                                                                                                                      | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                             |                                     |  |          |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                           |                                     |  |          |
|                                                                                                                                                                      | *Thermoglas<br>Philip Cary Mfg Co                                                     |                                     |  |          |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                     |                                     |  |          |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                          |                                     |  |          |
|                                                                                                                                                                      | *Aerogel<br>Johns-Manville Sales Corp                                                 |                                     |  |          |
|                                                                                                                                                                      |                                                                                       |                                     |  |          |
| 453                                                                                                                                                                  |                                                                                       | DUP 0990891                         |  |          |



090477

Z AA BB

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--|--------------|--|
| SN 100 M                                                                                                                                                             |                                                                                                                                                                                | MATERIAL SPECIFICATION - SERIES 100 |  | OCTOBER 1954 |  |
| Page 6                                                                                                                                                               |                                                                                                                                                                                | Rev Oct 1959                        |  |              |  |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12                              |  |              |  |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11                          |  |              |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber banded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |                                     |  |              |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                |                                     |  |              |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                                                                                   |                                     |  |              |  |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |                                     |  |              |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |                                     |  |              |  |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                                                                         |                                     |  |              |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |                                     |  |              |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |                                     |  |              |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |                                     |  |              |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |                                     |  |              |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |                                     |  |              |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |                                     |  |              |  |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on Gustin-Bacon Mfg Co                                                                                                                                        |                                     |  |              |  |
|                                                                                                                                                                      | * Mono-Kover Baldwin-Hill                                                                                                                                                      |                                     |  |              |  |
|                                                                                                                                                                      | * Thermoglas Philip Carey Mfg Co                                                                                                                                               |                                     |  |              |  |
|                                                                                                                                                                      | * Fiberglas Owens-Corning Corp                                                                                                                                                 |                                     |  |              |  |
|                                                                                                                                                                      | * Armaglas PF Pipe Insu Armstrong Cork Co                                                                                                                                      |                                     |  |              |  |
|                                                                                                                                                                      | * Aerolag Johns-Manville Sales Corp                                                                                                                                            |                                     |  |              |  |
|                                                                                                                                                                      | * PPG Glass Fiber Pima Plate Glass Co                                                                                                                                          |                                     |  |              |  |
|                                                                                                                                                                      | * Micro-Lab J-M Fiber Glass, Inc                                                                                                                                               |                                     |  |              |  |
|                                                                                                                                                                      |                                                                                                                                                                                |                                     |  |              |  |

454

98

DUP 0990892

XYZ AA-EE

113

| OCTOBER 1954                                                                                                                                                         |                                                                                               |                                                                                               |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                               |                                                                                               |  |
| Rev May 1959                                                                                                                                                         |                                                                                               |                                                                                               |  |
| Page 7                                                                                                                                                               |                                                                                               |                                                                                               |  |
| Code                                                                                                                                                                 | 112.16                                                                                        | 112.17                                                                                        |  |
| Material                                                                                                                                                             | Glass fiber                                                                                   | Glass fiber                                                                                   |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish. | Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish. |  |
| Filler                                                                                                                                                               |                                                                                               |                                                                                               |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                  | Phenol-formaldehyde or Di-Cy                                                                  |  |
| Temperature Range                                                                                                                                                    | 80°F to 300°F                                                                                 | 80°F to 300°F                                                                                 |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                  | 100°F - 0.25                                                                                  |  |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                        | 3" and 6" lb per cu ft                                                                        |  |
| Compressive Strength                                                                                                                                                 |                                                                                               |                                                                                               |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                | Machine molded                                                                                |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                     | Very good                                                                                     |  |
| Dimensions                                                                                                                                                           |                                                                                               |                                                                                               |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                                | Specify whether for iron pipe or copper tubing                                                |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                               |                                                                                               |  |
|                                                                                                                                                                      | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        |  |
|                                                                                                                                                                      | *Yone-Kover Baldwin-Hill                                                                      | *Yone-Kover Baldwin-Hill                                                                      |  |
|                                                                                                                                                                      | *Thermoglas Philip Carey Mfg Co                                                               | *Thermoglas Philip Carey Mfg Co                                                               |  |
|                                                                                                                                                                      | **Fiberglas Owens-Corning Corp                                                                | **Fiberglas Owens-Corning Corp                                                                |  |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu Armstrong Cork Co                                                     | **Armoglas PF Pipe Insu Armstrong Cork Co                                                     |  |
|                                                                                                                                                                      | *Aerolag Johns-Manville Sales Corp                                                            | *Aerolag Johns-Manville Sales Corp                                                            |  |
|                                                                                                                                                                      | *PPG Glass Fiber Potts Plate Glass Co                                                         | *PPG Glass Fiber Potts Plate Glass Co                                                         |  |
|                                                                                                                                                                      | *Micro-Lab J-M Fiber Glass Inc                                                                | *Micro-Lab J-M Fiber Glass Inc                                                                |  |
|                                                                                                                                                                      |                                                                                               |                                                                                               |  |

455



DUP 0990893

090479

XYZ AA EE

SN 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

Page 8

Rev May 1959

| Code                                                                                                                                                                 | 112.21                                                                                                                  | 112.22                                                                                                                  | 112.23                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                                                         |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with factory-applied white bleached kraft paper, laminated to the outer face of aluminum foil. |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde                                                                                                                                 |
| Temperature Range                                                                                                                                                    | 40°F to 200°F                                                                                                           | 40°F to 200°F                                                                                                           | 100°F to 250°F                                                                                                                                      |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                                                        |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                  | 3" and 6" lb per cu ft                                                                                                  | 3 lb per cu ft min                                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                                                         | Very low                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          | Machine molded                                                                                                          | Machine molded                                                                                                                                      |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               | Very good                                                                                                               | Very good                                                                                                                                           |
| Dimensions                                                                                                                                                           |                                                                                                                         |                                                                                                                         | 1/2 and 3/4 thick<br>3 ft sections                                                                                                                  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Low cost insulation for limited services such as hot water.                                                                                         |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |
|                                                                                                                                                                      | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | Universal Jacket<br>Owens-Corning Corp                                                                                                              |
|                                                                                                                                                                      | *Vono-Kover<br>Baldwin-Hill                                                                                             | *Vono-Kover<br>Baldwin-Hill                                                                                             |                                                                                                                                                     |
|                                                                                                                                                                      | *Thermaglas<br>Philip Carey Mfg Co                                                                                      | *Thermaglas<br>Philip Carey Mfg Co                                                                                      |                                                                                                                                                     |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                                                       | **Fiberglas<br>Owens-Corning Corp                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            |                                                                                                                                                     |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                                                   | *Aerolag<br>Johns-Manville Sales Corp                                                                                   |                                                                                                                                                     |
|                                                                                                                                                                      | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                |                                                                                                                                                     |
|                                                                                                                                                                      | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       |                                                                                                                                                     |
|                                                                                                                                                                      |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |

456

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DUP 0990894

090480

Y Z A B

187

| OCTOBER 1954                                                                                                                                                         |                                                                                                                | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                                                   | SM 100 M |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--|
| Rev July 1959                                                                                                                                                        |                                                                                                                |                                     |                                                                                                                                                                   | Page 9   |  |
| Code                                                                                                                                                                 | 112.61                                                                                                         |                                     | 112.66                                                                                                                                                            |          |  |
| Material                                                                                                                                                             | Glass fiber                                                                                                    |                                     | Glass fiber                                                                                                                                                       |          |  |
| Material Description                                                                                                                                                 | Plain semi-rigid board, formed from fibrous glass or mineral fibers.                                           |                                     | Short, coarse steam-blown glass fibers preformed into semi-rigid board, sanded on one side and cut into lagging sizes for ease of application to curved surfaces. |          |  |
| Filler                                                                                                                                                               |                                                                                                                |                                     |                                                                                                                                                                   |          |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                            |                                     | Phenol-formaldehyde                                                                                                                                               |          |  |
| Temperature Range                                                                                                                                                    | 40°F to 350°F                                                                                                  |                                     | 40°F to 350°F                                                                                                                                                     |          |  |
| K Factor                                                                                                                                                             | 100°F - 0.25 to 0.30                                                                                           |                                     | 100°F - 0.25                                                                                                                                                      |          |  |
| Density                                                                                                                                                              | 6 and 9 lb per cu ft                                                                                           |                                     | 9 lb per cu ft                                                                                                                                                    |          |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                |                                     |                                                                                                                                                                   |          |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                 |                                     | Machine molded                                                                                                                                                    |          |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                      |                                     | Very good                                                                                                                                                         |          |  |
| Dimensions                                                                                                                                                           | Std 24" x 48"<br>Thickness PF615 (6-lb density) 1/2" through 3".<br>PF617 (9-lb density), 1/2" through 2 1/4". |                                     | Length - 36"<br>Width - 6" or 12"<br>Thickness - 3/4", 1", 1 1/4", 1 1/2", and 2".                                                                                |          |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                |                                     |                                                                                                                                                                   |          |  |
|                                                                                                                                                                      | Fiberglas PF615 or 617 Insulation                                                                              |                                     | Fiberglas Block Insulation                                                                                                                                        |          |  |
|                                                                                                                                                                      | Owens-Corning Corp                                                                                             |                                     | Owens-Corning Corp                                                                                                                                                |          |  |
|                                                                                                                                                                      | Armtemp Spun Wool Duct - Plain                                                                                 |                                     | Armtemp Spun Wool Duct - Plain                                                                                                                                    |          |  |
|                                                                                                                                                                      | Armstrong Cork Co                                                                                              |                                     | Armstrong Cork Co                                                                                                                                                 |          |  |
|                                                                                                                                                                      | Spintex No. 414 or 415                                                                                         |                                     |                                                                                                                                                                   |          |  |
|                                                                                                                                                                      | Johns-Manville Co                                                                                              |                                     |                                                                                                                                                                   |          |  |
|                                                                                                                                                                      | Spun-duct                                                                                                      |                                     |                                                                                                                                                                   |          |  |
|                                                                                                                                                                      | Baldwin-Hill Co                                                                                                |                                     |                                                                                                                                                                   |          |  |
| DUP 0990895                                                                                                                                                          |                                                                                                                |                                     |                                                                                                                                                                   |          |  |

457

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DUP 0990895



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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|
| SN 100 M                                                                                                                                                             |                                                                                                                         | OCTOBER 1954  |                                                                                                                   |
| Page 10                                                                                                                                                              |                                                                                                                         | Rev July 1959 |                                                                                                                   |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |               |                                                                                                                   |
| Code                                                                                                                                                                 | 112.71                                                                                                                  |               | 112.81                                                                                                            |
| Material                                                                                                                                                             | Glass fiber                                                                                                             |               | Glass fiber                                                                                                       |
| Material Description                                                                                                                                                 | Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish. |               | Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface. |
| Filler                                                                                                                                                               |                                                                                                                         |               |                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                                     |               | Phenol-formaldehyde                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 150°F                                                                                                           |               | 40°F to 150°F                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.26                                                                                                            |               | 100°F - 0.26                                                                                                      |
| Density                                                                                                                                                              | 6 lb per cu ft                                                                                                          |               | 6 lb per cu ft                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |               |                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          |               | Machine molded                                                                                                    |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               |               | Very good                                                                                                         |
| Dimensions                                                                                                                                                           | 24" x 48" boards<br>3/4" to 2" thickness                                                                                |               | 24" x 48" boards<br>5/8" to 2" thickness                                                                          |
| Other Qualifications                                                                                                                                                 |                                                                                                                         |               | Neoprene coating on side of board exposed to air flow                                                             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |               |                                                                                                                   |
|                                                                                                                                                                      | Fiberglas Vapor Seal Duct Insu Owens-Corning Corp                                                                       |               | Fiberglas Coated Duct Insu Owens-Corning Corp                                                                     |
|                                                                                                                                                                      | Armasep Spun Wool Duct - Faced VB Armstrong Cork Co                                                                     |               | Armasep Spun Wool Duct - Coated Armstrong Cork Co                                                                 |
|                                                                                                                                                                      | Spintex No. 414 VS Johns-Manville Co                                                                                    |               | Coated Duct Insulation Baldwin-Hill Co                                                                            |
|                                                                                                                                                                      | Spunduct Baldwin-Hill Co                                                                                                |               |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |               |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |               |                                                                                                                   |
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458

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458



DUP 0990896

090482

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| OCTOBER 1954                                                                                                                                                         |                 | MATERIAL SPECIFICATION - SERIES 100 |                                                                       | SN 100 M |
| Rev. Oct. 1956                                                                                                                                                       |                 |                                     |                                                                       | Page 11  |
| Code                                                                                                                                                                 | 113             | 114                                 | 115                                                                   |          |
| Material                                                                                                                                                             | See Code 112.81 | Mineral wool (Black only)           | Mineral wool - asphalt impregnated                                    |          |
| Material Description                                                                                                                                                 |                 | Mineral slag wool                   | Mineral wool fibers homogeneously impregnated with an asphalt binder. |          |
| Filler                                                                                                                                                               |                 |                                     |                                                                       |          |
| Binder                                                                                                                                                               |                 | High temp. binder                   | Asphalt                                                               |          |
| Temperature Range                                                                                                                                                    |                 | 500°F to 1700°F                     | -200°F to 100°F                                                       |          |
| K Factor                                                                                                                                                             |                 | 500°F - 0.45 max.                   | 100°F - 0.34 max.                                                     |          |
| Density                                                                                                                                                              |                 | 19.2 lb. per cu. ft.                |                                                                       |          |
| Compressive Strength                                                                                                                                                 |                 | 12 lb. per sq. in.                  |                                                                       |          |
| Manufacturing Process                                                                                                                                                |                 | Machine matted                      | Machine matted                                                        |          |
| Resistance to Breakage in Handling                                                                                                                                   |                 | Good                                | Good                                                                  |          |
| Dimensions                                                                                                                                                           |                 |                                     |                                                                       |          |
| Other Qualifications                                                                                                                                                 |                 |                                     |                                                                       |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                 |                                     |                                                                       |          |
|                                                                                                                                                                      |                 | PV Supertemp<br>Eagle-Picher        | Rock Cork<br>Johns-Manville Sales Corp.                               |          |
|                                                                                                                                                                      |                 | Mono-Block<br>Baldwin Hill Co.      | Mineral Wool Board<br>Armstrong Cork Co.                              |          |
|                                                                                                                                                                      |                 | Armatemp<br>Armstrong Cork Co.      | Koldboard<br>Baldwin Hill Co.                                         |          |
|                                                                                                                                                                      |                 | M W Block<br>M. H. Detrick Co.      |                                                                       |          |
|                                                                                                                                                                      |                 |                                     |                                                                       |          |
|                                                                                                                                                                      |                 |                                     |                                                                       |          |
|                                                                                                                                                                      |                 |                                     |                                                                       |          |
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DUP 0990897

459

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| SN 100 M                                                                                                                                                             |                                                                                   | OCTOBER 1954                   |                                                                                                                                          |
| Page 12                                                                                                                                                              |                                                                                   | Rev Nov 1959                   |                                                                                                                                          |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                   |                                |                                                                                                                                          |
| Code                                                                                                                                                                 | 116                                                                               | 117                            | 117.1                                                                                                                                    |
| Material                                                                                                                                                             | Flexible foamed plastic                                                           | Urethane Foam Resilient        | Urethane Foam Resilient                                                                                                                  |
| Material Description                                                                                                                                                 | Flexible aerated neoprene with a closed cellular structure. Pipe and tubing only. | See Codes 117.1 through 117.5. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire-retardant additive. |
| Filler                                                                                                                                                               |                                                                                   |                                |                                                                                                                                          |
| Binder                                                                                                                                                               |                                                                                   |                                |                                                                                                                                          |
| Temperature Range                                                                                                                                                    | 32°F to 200°F                                                                     |                                | -100°F to +250°F                                                                                                                         |
| K Factor                                                                                                                                                             | 0.28 at 75°F                                                                      |                                | 0.30 max at 75°F                                                                                                                         |
| Density                                                                                                                                                              | 8 lb per cu ft                                                                    |                                | 3 to 3 1/4 lb per cu ft                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                   |                                |                                                                                                                                          |
| Manufacturing Process                                                                                                                                                | Medium molded                                                                     |                                | Molded "snap-on" pipe and fitting covers                                                                                                 |
| Resistance to Breakage in Handling                                                                                                                                   | Nonbreakable                                                                      |                                | Good                                                                                                                                     |
| Dimensions                                                                                                                                                           |                                                                                   |                                |                                                                                                                                          |
| Other Qualifications                                                                                                                                                 | Chemically inert and nontoxic<br>Self-extinguishing                               |                                | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                     |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                   |                                |                                                                                                                                          |
| 460                                                                                                                                                                  | Press-O-Cal<br>Pressite Div<br>American Mariette Corp                             |                                | Flexfoam<br>Delaware Ins Co                                                                                                              |
|                                                                                                                                                                      |                                                                                   |                                | Thermas<br>Am Cellular Products, Inc.                                                                                                    |
|                                                                                                                                                                      |                                                                                   |                                |                                                                                                                                          |
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| OCTOBER 1954                                                                                                                                                         |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
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| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Rev March 1959                                                                                                                                                       |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| SN 100 M                                                                                                                                                             |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Page 13                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Code                                                                                                                                                                 | 117.2                                                                                                                                                                           | 117.3                                                                                                                                                                                     | 117.4                                                                                                                                                                           |
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Resilient                                                                                                                                                                   | Urethane Foam Resilient                                                                                                                                                         |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 8-oz factory-applied canvas finish. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and kraft-aluminum factory-applied vapor barrier. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 30-lb factory-applied roofing felt. |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -100°F to +250°F                                                                                                                                                                          | -100°F to +250°F                                                                                                                                                                |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.3 max at 75°F                                                                                                                                                                           | 0.3 max at 75°F                                                                                                                                                                 |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 3 to 3 1/4 lb per cu ft                                                                                                                                                                   | 3 to 3 1/4 lb per cu ft                                                                                                                                                         |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded "snap-on" pipe and fitting covers                                                                                                                                                  | Molded "snap-on" pipe and fitting covers                                                                                                                                        |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                                                                      | Good                                                                                                                                                                            |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
| Other Qualifications                                                                                                                                                 | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                                                            |                                                                                                                                                                                           |                                                                                                                                                                                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
|                                                                                                                                                                      | Flexfoam Delaware Ins Co                                                                                                                                                        |                                                                                                                                                                                           | Thermas Am Cellular Products, Inc                                                                                                                                               |
|                                                                                                                                                                      | Thermas Am Cellular Products, Inc                                                                                                                                               |                                                                                                                                                                                           |                                                                                                                                                                                 |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                                                                           |                                                                                                                                                                                 |
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DUP 090899



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SN 100 M

Page 14

OCTOBER 1954

Rev Oct 1959

MATERIAL SPECIFICATION - SERIES 100

| Code                                                                                                                                                                 | 117.5                                                                                                                                                                           | 118                                                                                                                                  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--|
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Rigid                                                                                                                  |  |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 45-lb factory-applied roofing felt. | Preformed rigid urethane foam block and pipe insulation manufactured with du Pont "Hylene" and containing a fire retardant additive. |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -200°F to +200°F                                                                                                                     |  |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.17 max at 75°F                                                                                                                     |  |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 2 to 2 1/4 lb per cu ft                                                                                                              |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded                                                                                                                               |  |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                 |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                      |  |
| Other Qualifications                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                      |  |
| 462                                                                                                                                                                  | Flexfoam<br>Deleware Ins Co                                                                                                                                                     | K-Foam<br>Baldwin Hill Co                                                                                                            |  |
|                                                                                                                                                                      | Thermax<br>Am Cellular Products, Inc                                                                                                                                            |                                                                                                                                      |  |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                      |  |
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**DUP 0990907**

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| SM 100 M                                                                                                                                                             |                                                              | OCTOBER 1954  |                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                              |               |                                                                                                                                                                           |
| Page 2                                                                                                                                                               |                                                              | Rev July 1959 |                                                                                                                                                                           |
| Code                                                                                                                                                                 | 104                                                          |               | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |               | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |               | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |               |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |               | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.54 max<br>Block - 500°F - 0.58 max |               | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |               | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |               | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |               | Formed and comp on mandril. Pipe mach cut on dia                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |               | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |               |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |               | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |               |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kaylo 20 is 1800°F<br><br>464                                                         | Alltemp Philip Carey Co                                      |               | Unibestos Union Asbestos & Rubber Co                                                                                                                                      |
|                                                                                                                                                                      | Kaylo 20 Owens-Corning Corp                                  |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |               |                                                                                                                                                                           |
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DUP 0990902

090488

T U V V X Y Z A E

145

| OCTOBER 1954                                                                                                                                                            |                                                                                                   |     |                                                                                                     | SN 100 M |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------|----------|
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                     |                                                                                                   |     |                                                                                                     | Page 3   |
| Code                                                                                                                                                                    | 107                                                                                               | 108 | 109                                                                                                 |          |
| Material                                                                                                                                                                | Asbestos sponge                                                                                   |     | Corrugated asbestos<br>preshrunk                                                                    |          |
| Material Description                                                                                                                                                    | Asbestos sheets separated<br>by finely ground sponged<br>material bonded with<br>adhesive strips. |     | Alternate layers of plain<br>and corrugated asbestos<br>sheets.<br>Outer covering asbestos<br>felt. |          |
| Filler                                                                                                                                                                  |                                                                                                   |     |                                                                                                     |          |
| Binder                                                                                                                                                                  |                                                                                                   |     |                                                                                                     |          |
| Temperature<br>Range                                                                                                                                                    | 100°F to 700°F                                                                                    |     | 100°F to 400°F                                                                                      |          |
| K Factor                                                                                                                                                                | 500°F - 0.60 max                                                                                  |     | 200°F - 0.58 max                                                                                    |          |
| Density                                                                                                                                                                 | 30 lb max                                                                                         |     |                                                                                                     |          |
| Compressive<br>Strength                                                                                                                                                 |                                                                                                   |     |                                                                                                     |          |
| Manufacturing<br>Process                                                                                                                                                | Laminated - 38 to 42<br>layers per in. of thickness                                               |     | 3-ply laminate                                                                                      |          |
| Resistance to Breakage<br>in Handling                                                                                                                                   | Very good                                                                                         |     | Good                                                                                                |          |
| Dimensions                                                                                                                                                              | To Specification                                                                                  |     |                                                                                                     |          |
| Other<br>Qualifications                                                                                                                                                 | Must be a flexible product                                                                        |     | Preshrunk                                                                                           |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that<br>their product meets the above specifications. |                                                                                                   |     |                                                                                                     |          |
| * Aircell -4-ply<br>Excel -6-ply<br>Caucel-8-ply                                                                                                                        | Asbestos Sponge<br>Johns-Manville Sales Corp                                                      |     | Preshrunk Asbestocel<br>Johns-Manville Sales Corp                                                   |          |
|                                                                                                                                                                         | Asbestos Sponge<br>Philip Carey Mfg Co                                                            |     | Aircell<br>Philip Carey Mfg Co                                                                      |          |
|                                                                                                                                                                         | Sponge Felt<br>The Ruberoid Co                                                                    |     | K & M - Aircell<br>Keesbey & Mattison Co                                                            |          |
|                                                                                                                                                                         | Sponge Felt<br>Ehret Mfg Mfg Co, Inc                                                              |     | B-H Aircell<br>Baldwin-Hill Co                                                                      |          |
|                                                                                                                                                                         | Sponge Felt<br>Smith and Kensler Corp                                                             |     |                                                                                                     |          |
|                                                                                                                                                                         |                                                                                                   |     |                                                                                                     |          |
|                                                                                                                                                                         |                                                                                                   |     |                                                                                                     |          |
| 465                                                                                                                                                                     |                                                                                                   |     |                                                                                                     |          |

DUP 0990903

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T U V W X Y Z A A E E

| SN 100 M                                                                                                                                                             |                                                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                    |                                 | OCTOBER 1954  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------|---------------|
| Page 4                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 | Rev Sept 1958 |
| Code                                                                                                                                                                 | 110                                                                                                                                                     | 111                                                    | 112                             |               |
| Material                                                                                                                                                             | Vegetable cork                                                                                                                                          | Cellular glass                                         | Glass fiber                     |               |
| Material Description                                                                                                                                                 | Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation. | Cellular glass foamed and fused into unicellular form. | See codes 112.01 through 112.81 |               |
| Filler                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 |               |
| Binder                                                                                                                                                               | Natural resin in cork                                                                                                                                   |                                                        |                                 |               |
| Temperature Range                                                                                                                                                    | -200°F to 100°F                                                                                                                                         | -200°F to 100°F<br>(+300°F for dual temp.)             |                                 |               |
| K Factor                                                                                                                                                             | 100°F - 0.29 max                                                                                                                                        | 100°F - 0.43 max                                       |                                 |               |
| Density                                                                                                                                                              | 9 - 11 lb per cu ft                                                                                                                                     | 10 - 11 lb per cu ft                                   |                                 |               |
| Compressive Strength                                                                                                                                                 | 15 lb per sq in. min                                                                                                                                    | 35 lb per sq in. min                                   |                                 |               |
| Manufacturing Process                                                                                                                                                | Machine comp. or molded.<br>Baked at moderate temp.                                                                                                     |                                                        |                                 |               |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                    |                                                        |                                 |               |
| Dimensions                                                                                                                                                           |                                                                                                                                                         |                                                        |                                 |               |
| Other Qualifications                                                                                                                                                 | Pipe covering shall be coated on the outside with heavy mastic                                                                                          |                                                        |                                 |               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                         |                                                        |                                 |               |
| 466                                                                                                                                                                  | Cork<br>Armstrong Cork Co                                                                                                                               | Foamglas<br>Pittsburgh Corning Corp                    |                                 |               |
|                                                                                                                                                                      | Cork<br>Mundet Cork Co                                                                                                                                  |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
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DUP 0990904

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V W X Y Z A 1 2 3

| OCTOBER 1954                                                                                                                                                         |                                                                                       | MATERIAL SPECIFICATION - SERIES 100 |  | SM 100 M    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|--|-------------|
| Rev Dec 1953                                                                                                                                                         |                                                                                       |                                     |  | Page 5      |
| Code                                                                                                                                                                 | 112.01                                                                                | 112.02                              |  |             |
| Material                                                                                                                                                             | Glass fiber                                                                           | See Code 112.01                     |  |             |
| Material Description                                                                                                                                                 | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                     |  |             |
| Filler                                                                                                                                                               |                                                                                       |                                     |  |             |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                          |                                     |  |             |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                         |                                     |  |             |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                          |                                     |  |             |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                |                                     |  |             |
| Compressive Strength                                                                                                                                                 |                                                                                       |                                     |  |             |
| Manufacturing Process                                                                                                                                                | Machine made                                                                          |                                     |  |             |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                             |                                     |  |             |
| Dimensions                                                                                                                                                           |                                                                                       |                                     |  |             |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                        |                                     |  |             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                       |                                     |  |             |
| 467                                                                                                                                                                  | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                             |                                     |  | DUP 0990905 |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                           |                                     |  |             |
|                                                                                                                                                                      | *Thermoglas<br>Philip Cory Mfg Co                                                     |                                     |  |             |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                     |                                     |  |             |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                          |                                     |  |             |
|                                                                                                                                                                      | *Aeroglas<br>Johns-Manville Sales Corp                                                |                                     |  |             |
|                                                                                                                                                                      |                                                                                       |                                     |  |             |
|                                                                                                                                                                      |                                                                                       |                                     |  |             |



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| SN 100 M                                                                                                                                                             |                                                                                                                                                                                | OCTOBER 1954                        |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--|
| Page 6                                                                                                                                                               |                                                                                                                                                                                | MATERIAL SPECIFICATION - SERIES 100 |  |
|                                                                                                                                                                      |                                                                                                                                                                                | Rev Oct 1959                        |  |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12                              |  |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11                          |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |                                     |  |
| Filler                                                                                                                                                               |                                                                                                                                                                                |                                     |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                                                                                   |                                     |  |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |                                     |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |                                     |  |
| Density                                                                                                                                                              | 3" and 6" 1b per cu ft                                                                                                                                                         |                                     |  |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |                                     |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |                                     |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |                                     |  |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |                                     |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |                                     |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |                                     |  |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on Gustin-Bacon Mfg Co                                                                                                                                        |                                     |  |
|                                                                                                                                                                      | * Mono-Kover Baldwin-Hill                                                                                                                                                      |                                     |  |
|                                                                                                                                                                      | * Thermoglas Philip Carey Mfg Co                                                                                                                                               |                                     |  |
|                                                                                                                                                                      | * Fiberglas Owens-Corning Corp                                                                                                                                                 |                                     |  |
|                                                                                                                                                                      | * Armaglas PF Pipe Insu Armstrong Cork Co                                                                                                                                      |                                     |  |
|                                                                                                                                                                      | * Aerolag Johns-Manville Sales Corp                                                                                                                                            |                                     |  |
|                                                                                                                                                                      | * PPG Glass Fiber Pitts Plate Glass Co                                                                                                                                         |                                     |  |
|                                                                                                                                                                      | * Micro-Lok J-M Fiber Glass, Inc                                                                                                                                               |                                     |  |
|                                                                                                                                                                      |                                                                                                                                                                                |                                     |  |

98

DUP 0990906

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XYZ AAE

113

| OCTOBER 1954                                                                                                                                                         |                                                                                               | MATERIAL SPECIFICATION - SERIES 100                                                           |  | SM 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--|----------|
| Rev May 1959                                                                                                                                                         |                                                                                               |                                                                                               |  | Page 7   |
| Code                                                                                                                                                                 | 112.16                                                                                        | 112.17                                                                                        |  |          |
| Material                                                                                                                                                             | Glass fiber                                                                                   | Glass fiber                                                                                   |  |          |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 4-oz factory-applied canvas finish. | Textile type fine glass fiber bonded pipe insulation with 8-oz factory-applied canvas finish. |  |          |
| Filler                                                                                                                                                               |                                                                                               |                                                                                               |  |          |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                  | Phenol-formaldehyde or Di-Cy                                                                  |  |          |
| Temperature Range                                                                                                                                                    | 80°F to 300°F                                                                                 | 80°F to 300°F                                                                                 |  |          |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                  | 100°F - 0.25                                                                                  |  |          |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                        | 3" and 6" lb per cu ft                                                                        |  |          |
| Compressive Strength                                                                                                                                                 |                                                                                               |                                                                                               |  |          |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                | Machine molded                                                                                |  |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                     | Very good                                                                                     |  |          |
| Dimensions                                                                                                                                                           |                                                                                               |                                                                                               |  |          |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                                | Specify whether for iron pipe or copper tubing                                                |  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                               |                                                                                               |  |          |
| 469                                                                                                                                                                  | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        | *Ultrafine Snap-on Gustin-Bacon Mfg Co                                                        |  |          |
|                                                                                                                                                                      | *Mono-Kover Baldwin-Hill                                                                      | *Mono-Kover Baldwin-Hill                                                                      |  |          |
|                                                                                                                                                                      | *Thermoglas Philip Carey Mfg Co                                                               | *Thermoglas Philip Carey Mfg Co                                                               |  |          |
|                                                                                                                                                                      | **Fiberglas Owens-Corning Corp                                                                | **Fiberglas Owens-Corning Corp                                                                |  |          |
|                                                                                                                                                                      | **Armoglas PF Pipe Ins Armstrong Cork Co                                                      | **Armoglas PF Pipe Ins Armstrong Cork Co                                                      |  |          |
|                                                                                                                                                                      | *Aerolag Johns-Manville Sales Corp                                                            | *Aerolag Johns-Manville Sales Corp                                                            |  |          |
|                                                                                                                                                                      | *PPG Glass Fiber Pitts Plate Glass Co                                                         | *PPG Glass Fiber Pitts Plate Glass Co                                                         |  |          |
|                                                                                                                                                                      | *Micro-Lok J-M Fiber Glass Inc                                                                | *Micro-Lok J-M Fiber Glass Inc                                                                |  |          |
|                                                                                                                                                                      |                                                                                               |                                                                                               |  |          |

DUP 0990907



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| SM 100 M                                                                                                                                                             |                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                                                                                     |                                                                                                                                                     | OCTOBER 1954 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Page 2                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     | Rev May 1959 |
| Code                                                                                                                                                                 | 112.21                                                                                                                  | 112.22                                                                                                                  | 112.23                                                                                                                                              |              |
| Material                                                                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                             | Glass fiber                                                                                                                                         |              |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish. | Textile type fine glass fiber bonded pipe insulation with factory-applied white bleached kraft paper, laminated to the outer face of aluminum foil. |              |
| Filler                                                                                                                                                               |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |              |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde or Di-Cy                                                                                            | Phenol-formaldehyde                                                                                                                                 |              |
| Temperature Range                                                                                                                                                    | 40°F to 200°F                                                                                                           | 40°F to 200°F                                                                                                           | 100°F to 250°F                                                                                                                                      |              |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                            | 100°F - 0.25                                                                                                                                        |              |
| Density                                                                                                                                                              | 3" and 6" 1b per cu ft                                                                                                  | 3" and 6" 1b per cu ft                                                                                                  | 3 lb per cu ft min                                                                                                                                  |              |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |                                                                                                                         | Very low                                                                                                                                            |              |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          | Machine molded                                                                                                          | Machine molded                                                                                                                                      |              |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               | Very good                                                                                                               | Very good                                                                                                                                           |              |
| Dimensions                                                                                                                                                           |                                                                                                                         |                                                                                                                         | 1/2 and 3/4 thick<br>3 ft sections                                                                                                                  |              |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Specify whether for iron pipe or copper tubing. Weather protection is required for outside service.                     | Low cost insulation for limited services such as hot water.                                                                                         |              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |              |
| 470                                                                                                                                                                  | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                                                               | Universal Jacket<br>Owens-Corning Corp                                                                                                              |              |
|                                                                                                                                                                      | *Mons-Kover<br>Baldwin-Hill                                                                                             | *Mons-Kover<br>Baldwin-Hill                                                                                             |                                                                                                                                                     |              |
|                                                                                                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      | *Thermoglas<br>Philip Carey Mfg Co                                                                                      |                                                                                                                                                     |              |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                                                       | **Fiberglas<br>Owens-Corning Corp                                                                                       |                                                                                                                                                     |              |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                                                            |                                                                                                                                                     |              |
|                                                                                                                                                                      | *Aerolag<br>Johns-Manville Sales Corp                                                                                   | *Aerolag<br>Johns-Manville Sales Corp                                                                                   |                                                                                                                                                     |              |
|                                                                                                                                                                      | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                | *PPG Glass Fiber<br>Pitts Plate Glass Co                                                                                |                                                                                                                                                     |              |
|                                                                                                                                                                      | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       | *Micro-Lok<br>J-M Fiber Glass Inc                                                                                       |                                                                                                                                                     |              |
|                                                                                                                                                                      |                                                                                                                         |                                                                                                                         |                                                                                                                                                     |              |



DUP 090908

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| OCTOBER 1954                                                                                                                                                         |                                                                                                                |  |                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                |  |                                                                                                                                                                   |
| Rev July 1959                                                                                                                                                        |                                                                                                                |  |                                                                                                                                                                   |
| Page 9                                                                                                                                                               |                                                                                                                |  |                                                                                                                                                                   |
| Code                                                                                                                                                                 | 112.61                                                                                                         |  | 112.66                                                                                                                                                            |
| Material                                                                                                                                                             | Glass fiber                                                                                                    |  | Glass fiber                                                                                                                                                       |
| Material Description                                                                                                                                                 | Plain semi-rigid board, formed from fibrous glass or mineral fibers.                                           |  | Short, coarse steam-blown glass fibers preformed into semi-rigid board, sanded on one side and cut into lagging sizes for ease of application to curved surfaces. |
| Filler                                                                                                                                                               |                                                                                                                |  |                                                                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                            |  | Phenol-formaldehyde                                                                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 350°F                                                                                                  |  | 40°F to 350°F                                                                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.25 to 0.30                                                                                           |  | 100°F - 0.25                                                                                                                                                      |
| Density                                                                                                                                                              | 6 and 9 lb per cu ft                                                                                           |  | 9 lb per cu ft                                                                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                |  |                                                                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                 |  | Machine molded                                                                                                                                                    |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                      |  | Very good                                                                                                                                                         |
| Dimensions                                                                                                                                                           | Std 24" x 48"<br>Thickness PF615 (6-lb density) 1/2" through 3".<br>PF617 (9-lb density), 1/2" through 2 1/4". |  | Length - 36"<br>Width - 6" or 12"<br>Thickness - 3/4", 1", 1 1/4", 1 1/2", and 2".                                                                                |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                |  |                                                                                                                                                                   |
| 471                                                                                                                                                                  | Fiberglas PF615 or 617 Insulation<br>Owens-Corning Corp                                                        |  | Fiberglas Block Insulation<br>Owens-Corning Corp                                                                                                                  |
|                                                                                                                                                                      | Armazemp Spun Wool Duct - Plain<br>Armstrong Cork Co                                                           |  | Armoglas Block Insulation<br>Armstrong Cork Co                                                                                                                    |
|                                                                                                                                                                      | Spintex No. 414 or 415<br>Johns-Manville Co                                                                    |  |                                                                                                                                                                   |
|                                                                                                                                                                      | Spunduct<br>Baldwin-Hill Co                                                                                    |  |                                                                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                |  |                                                                                                                                                                   |
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DUP 0990909



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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|
| SN 100 M                                                                                                                                                             |                                                                                                                         | OCTOBER 1954  |                                                                                                                   |
| Page 10                                                                                                                                                              |                                                                                                                         | Rev July 1959 |                                                                                                                   |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                                                         |               |                                                                                                                   |
| Code                                                                                                                                                                 | 112.71                                                                                                                  |               | 112.81                                                                                                            |
| Material                                                                                                                                                             | Glass fiber                                                                                                             |               | Glass fiber                                                                                                       |
| Material Description                                                                                                                                                 | Bonded board insulation formed from fibrous glass or mineral fibers, with asphalt and kraft paper vapor-barrier finish. |               | Bonded acoustical board formed from fibrous glass or mineral fibers with a thin neoprene compound on one surface. |
| Filler                                                                                                                                                               |                                                                                                                         |               |                                                                                                                   |
| Binder                                                                                                                                                               | Phenol-formaldehyde                                                                                                     |               | Phenol-formaldehyde                                                                                               |
| Temperature Range                                                                                                                                                    | 40°F to 150°F                                                                                                           |               | 40°F to 150°F                                                                                                     |
| K Factor                                                                                                                                                             | 100°F - 0.26                                                                                                            |               | 100°F - 0.26                                                                                                      |
| Density                                                                                                                                                              | 6 lb per cu ft                                                                                                          |               | 6 lb per cu ft                                                                                                    |
| Compressive Strength                                                                                                                                                 |                                                                                                                         |               |                                                                                                                   |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                          |               | Machine molded                                                                                                    |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                               |               | Very good                                                                                                         |
| Dimensions                                                                                                                                                           | 24" x 48" boards<br>3/4" to 2" thickness                                                                                |               | 24" x 48" boards<br>5/8" to 2" thickness                                                                          |
| Other Qualifications                                                                                                                                                 |                                                                                                                         |               | Neoprene coating on side of board exposed to air flow                                                             |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                         |               |                                                                                                                   |
| 472                                                                                                                                                                  | Fiberglas Vapor Seal Duct Insu Owens-Corning Corp                                                                       |               | Fiberglas Coated Duct Insu Owens-Corning Corp                                                                     |
|                                                                                                                                                                      | Armastemp Spun Boil Duct - Faced VB Armstrong Cork Co                                                                   |               | Armastemp Spun Boil Duct - Coated Armstrong Cork Co                                                               |
|                                                                                                                                                                      | Spindex No. 414 VS Johns-Manville Co                                                                                    |               | Coated Duct Insulation Baldwin-Hill Co                                                                            |
|                                                                                                                                                                      | Spindex Baldwin-Hill Co                                                                                                 |               |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |               |                                                                                                                   |
|                                                                                                                                                                      |                                                                                                                         |               |                                                                                                                   |
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188

DUP 0990910

090496

LM 1010: 0701/XYZ AA 33

OCTOBER 1954

Rev. Oct. 1956

## MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Page 11

| Code                               | 113             | 114                       | 115                                                                   |
|------------------------------------|-----------------|---------------------------|-----------------------------------------------------------------------|
| Material                           | See Code 112.81 | Mineral wool (Black only) | Mineral wool - asphalt impregnated                                    |
| Material Description               |                 | Mineral slag wool         | Mineral wool fibers homogeneously impregnated with an asphalt binder. |
| Filler                             |                 |                           |                                                                       |
| Binder                             |                 | High temp. binder         | Asphalt                                                               |
| Temperature Range                  |                 | 500°F to 1700°F           | -200°F to 100°F                                                       |
| K Factor                           |                 | 500°F - 0.45 max.         | 100°F - 0.34 max.                                                     |
| Density                            |                 | 19.2 lb. per cu. ft.      |                                                                       |
| Compressive Strength               |                 | 12 lb. per sq. in.        |                                                                       |
| Manufacturing Process              |                 | Machine molded            | Machine molded                                                        |
| Resistance to Breakage in Handling |                 | Good                      | Good                                                                  |
| Dimensions                         |                 |                           |                                                                       |
| Other Qualifications               |                 |                           |                                                                       |

The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.

|  |  |                                |                                          |
|--|--|--------------------------------|------------------------------------------|
|  |  | PV Supersemp<br>Eagle-Picher   | Rock Cork<br>Johns-Manville Sales Corp.  |
|  |  | Mono-Block<br>Baldwin Hill Co. | Mineral Foot Board<br>Armstrong Cork Co. |
|  |  | Armasep<br>Armstrong Cork Co.  | Koldboard<br>Baldwin Hill Co.            |
|  |  | M F Block<br>M. H. Detrick Co. |                                          |
|  |  |                                |                                          |
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473

DUP 0990911

**DUP 0990917**



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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| SN 100 M                                                                                                                                                             |                                                                                   | OCTOBER 1954                   |                                                                                                                                          |
| Page 12                                                                                                                                                              |                                                                                   | Rev. Nov 1959                  |                                                                                                                                          |
| MATERIAL SPECIFICATION - SERIES 100                                                                                                                                  |                                                                                   |                                |                                                                                                                                          |
| Code                                                                                                                                                                 | 116                                                                               | 117                            | 117.1                                                                                                                                    |
| Material                                                                                                                                                             | Flexible foamed plastic                                                           | Urethane Foam Resilient        | Urethane Foam Resilient                                                                                                                  |
| Material Description                                                                                                                                                 | Flexible aerated neoprene with a closed cellular structure. Pipe and tubing only. | See Codes 117.1 through 117.5. | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire-retardant additive. |
| Filler                                                                                                                                                               |                                                                                   |                                |                                                                                                                                          |
| Binder                                                                                                                                                               |                                                                                   |                                |                                                                                                                                          |
| Temperature Range                                                                                                                                                    | 32°F to 200°F                                                                     |                                | -100°F to +250°F                                                                                                                         |
| K Factor                                                                                                                                                             | 0.28 at 75°F                                                                      |                                | 0.30 max at 75°F                                                                                                                         |
| Density                                                                                                                                                              | 8 lb per cu ft                                                                    |                                | 3 to 3 1/4 lb per cu ft                                                                                                                  |
| Compressive Strength                                                                                                                                                 |                                                                                   |                                |                                                                                                                                          |
| Manufacturing Process                                                                                                                                                | Medium molded                                                                     |                                | Molded "snap-on" pipe and fitting covers                                                                                                 |
| Resistance to Breakage in Handling                                                                                                                                   | Nonbreakable                                                                      |                                | Good                                                                                                                                     |
| Dimensions                                                                                                                                                           |                                                                                   |                                |                                                                                                                                          |
| Other Qualifications                                                                                                                                                 | Chemically inert and nontoxic<br>Self-extinguishing                               |                                | Cell structure not less than 40 per inch, not more than 60 per inch.                                                                     |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                   |                                |                                                                                                                                          |
| 474                                                                                                                                                                  | Press-O-Cal<br>Pressite Div<br>American Marietta Corp                             |                                | Flexfoam<br>Delaware Ins Co                                                                                                              |
|                                                                                                                                                                      |                                                                                   |                                | Therma<br>Am Cellular Products, Inc                                                                                                      |
|                                                                                                                                                                      |                                                                                   |                                |                                                                                                                                          |
|                                                                                                                                                                      |                                                                                   |                                |                                                                                                                                          |
|                                                                                                                                                                      |                                                                                   |                                |                                                                                                                                          |
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182

DUP 090912

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101

OCTOBER 1954

Rev Feb 1960

## MATERIAL SPECIFICATION - SERIES 100

SM 100 M

Page 13

|                                                                                                                                                                      |  |                                                                                                                                                                                           |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Code                                                                                                                                                                 |  | 117.3                                                                                                                                                                                     |  |
| Material                                                                                                                                                             |  | Urethane Foam Resilient                                                                                                                                                                   |  |
| Material Description                                                                                                                                                 |  | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and kraft-aluminum factory-applied vapor barrier. |  |
| Filler                                                                                                                                                               |  |                                                                                                                                                                                           |  |
| Binder                                                                                                                                                               |  |                                                                                                                                                                                           |  |
| Temperature Range                                                                                                                                                    |  | 50°F to + 250°F                                                                                                                                                                           |  |
| K Factor                                                                                                                                                             |  | 0.3 max at 75°F                                                                                                                                                                           |  |
| Density                                                                                                                                                              |  | 2 to 5 lb per cu ft                                                                                                                                                                       |  |
| Compressive Strength                                                                                                                                                 |  |                                                                                                                                                                                           |  |
| Manufacturing Process                                                                                                                                                |  | Molded "snap-on" pipe and fitting covers                                                                                                                                                  |  |
| Resistance to Breakage in Handling                                                                                                                                   |  | Good                                                                                                                                                                                      |  |
| Dimensions                                                                                                                                                           |  |                                                                                                                                                                                           |  |
| Other Qualifications                                                                                                                                                 |  |                                                                                                                                                                                           |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |  |                                                                                                                                                                                           |  |
| 475                                                                                                                                                                  |  |                                                                                                                                                                                           |  |
|                                                                                                                                                                      |  |                                                                                                                                                                                           |  |
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| SM 100 M                                                                                                                                                             |                                                                                                                                                                                 | MATERIAL SPECIFICATION - SERIES 100                                                                                                  |  | OCTOBER 1954 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--|--------------|
| Page 14                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                      |  | Rev Oct 1959 |
| Code                                                                                                                                                                 | 117.5                                                                                                                                                                           | 118                                                                                                                                  |  |              |
| Material                                                                                                                                                             | Urethane Foam Resilient                                                                                                                                                         | Urethane Foam Rigid                                                                                                                  |  |              |
| Material Description                                                                                                                                                 | Preformed resilient urethane foam pipe insulation manufactured from polyether resin and du Pont "Hylene" with a fire retardant additive and 45-lb factory-applied roofing felt. | Preformed rigid urethane foam block and pipe insulation manufactured with du Pont "Hylene" and containing a fire retardant additive. |  |              |
| Filler                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Binder                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Temperature Range                                                                                                                                                    | -100°F to +250°F                                                                                                                                                                | -200°F to +200°F                                                                                                                     |  |              |
| K Factor                                                                                                                                                             | 0.3 max at 75°F                                                                                                                                                                 | 0.17 max at 75°F                                                                                                                     |  |              |
| Density                                                                                                                                                              | 3 to 3 1/4 lb per cu ft                                                                                                                                                         | 2 to 2 1/4 lb per cu ft                                                                                                              |  |              |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Manufacturing Process                                                                                                                                                | Molded "snap-on" pipe and fitting covers                                                                                                                                        | Molded                                                                                                                               |  |              |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                                            | Good                                                                                                                                 |  |              |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| Other Qualifications                                                                                                                                                 |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                 |                                                                                                                                      |  |              |
| 476                                                                                                                                                                  | Flexfoam Delaware Ins Co                                                                                                                                                        | K-Foam Baldwin Hill Co                                                                                                               |  |              |
|                                                                                                                                                                      | Therman Am Cellular Products, Inc                                                                                                                                               |                                                                                                                                      |  |              |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                      |  |              |
|                                                                                                                                                                      |                                                                                                                                                                                 |                                                                                                                                      |  |              |
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DUP 0990914

090500

**MATERIAL SPECIFICATION  
SERIES 100  
PREFORMED BLOCK AND PIPE**

# THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION

|         |           |
|---------|-----------|
| ISSUED  | OCT 1954  |
| REVISED | JULY 1959 |

SN 100 M  
Page 1 of 14

| Code                                                                                                                                                                                                                                           | 101*                                                        | 102*                                         | 103                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------|
| Material                                                                                                                                                                                                                                       | 85% Magnesia                                                | Calcium silicate                             | Diatomaceous earth                                                         |
| Material Description                                                                                                                                                                                                                           | Hydrated basic magnesium carbonate<br>80% by weight minimum | Stable, cellular, calcined fire clay base    | Diatomaceous earth, asbestos fiber, with sand clay and cementing materials |
| Filler                                                                                                                                                                                                                                         | Asbestos or glass fiber                                     |                                              |                                                                            |
| Binder                                                                                                                                                                                                                                         | Clay or other cementing materials 5% by weight              |                                              |                                                                            |
| Temperature Range                                                                                                                                                                                                                              | 100°F to 500°F                                              | 100°F to 1200°F                              | 500°F to 1800°F                                                            |
| K Factor                                                                                                                                                                                                                                       | 200°F - 0.4, 500°F - 0.5                                    | 500°F - 0.54 max                             | 500°F - 0.77 max                                                           |
| Density                                                                                                                                                                                                                                        | 11-14 lb per cu ft                                          | 11 lb per cu ft                              | 24-27 lb per cu ft                                                         |
| Compressive Strength                                                                                                                                                                                                                           |                                                             |                                              |                                                                            |
| Manufacturing Process                                                                                                                                                                                                                          | Machine molded or extru. Pipe mach cut on diameter.         | Machine extruded. Pipe mach cut on diameter. | Machine molded. Pipe mach cut on diameter.                                 |
| Resistance to Breakage in Handling                                                                                                                                                                                                             | Good                                                        | Good                                         | Good                                                                       |
| Dimensions                                                                                                                                                                                                                                     | ASTM **                                                     | ASTM **                                      | To Specification                                                           |
| Other Qualifications                                                                                                                                                                                                                           |                                                             | Good mechanical strength with low shrinkage. |                                                                            |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                           |                                                             |                                              |                                                                            |
| *Bands are supplied at extra cost. Order must state "with our bands" if not required.<br>For 11" IPS and larger there is an additional charge for 2-ws curves cover. Material should be specified "without 2-ws curves" to avoid extra charge. | 85% Mag<br>Phillip Carey Mfg. Co                            | Calcisil<br>The Ruberoid Co                  | High Temp No. 19<br>Phillip Carey Mfg. Co                                  |
|                                                                                                                                                                                                                                                | Thermalite 832<br>Ehrst Mag Mfg Co. Inc                     | Kerite<br>Owens-Corning Corp                 | Enduro Hi-Temp.<br>Ehrst Mag Mfg Co. Inc                                   |
|                                                                                                                                                                                                                                                | 85% Mag.<br>Johns-Manville Sales Corp                       | Thermobestos<br>Johns-Manville Sales Corp    | J/M Superes<br>Johns-Manville Sales Corp                                   |
|                                                                                                                                                                                                                                                |                                                             | Keratherm<br>Kearby & Harrison Co            | High Temp.<br>Kearby & Harrison Co                                         |
| **New Simplified Dimensional System sponsored by ASTM                                                                                                                                                                                          | Featherweight<br>Kearby & Harrison Co                       | Tricelise<br>Mundt Clark Corp                |                                                                            |
| ***Fiber Board Paper Products Corp                                                                                                                                                                                                             | 85% Mag<br>Mundt Clark Corp                                 | Celsamp<br>Pabco Ind Ins Div ***             |                                                                            |
| † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.                                                                                                                                                    | Process-molded<br>Pabco Ind Ins Div ***                     |                                              |                                                                            |

DUP 09905

Vendors and merchandise designations are given to describe material and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this Specification.

**SECRET**

**DUP 0990535**



12-211.

**040562**

| Code                                                                                                                                                                 | 104                                                          | 106                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                                                                                                                                                             | Inorganic silicates                                          | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.54 max<br>Block - 500°F - 0.58 max | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 13 lb per cu ft<br>Block - 14 lb per cu ft   | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      | Formed and comp on mandril. Pipe mach cut on die                                                                                                                          |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kevlar 20 is 1800°F                                                                   | Alltemp<br>Phillip Carey Co                                  | Unibestos<br>Union Asbestos & Rubber Co                                                                                                                                   |
|                                                                                                                                                                      | Kevlar 20<br>Owens-Corning Corp                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |
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|                                                                                                                                                                      |                                                              |                                                                                                                                                                           |



DUP 0990536

040563

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| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                               |                                                          | ISSUED<br>OCT 1954<br>REVISED<br>MARCH 1959              | SN 100 M<br>Page 1 of 14                                                        |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                           | 101*                                                     | 102*                                                     | 103                                                                             |
| Material                                                                                                                                                                                                                                                                                                                                                                                                                                       | 85% Magnesite                                            | Calcium silicate                                         | Diatomaceous earth                                                              |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                           | Hydrated basic magnesium carbonate 80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bentonite clay and cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                         | Asbestos or glass fiber                                  |                                                          |                                                                                 |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                         | Clay or other cementing materials 5% by weight           |                                                          |                                                                                 |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                              | 100°F to 500°F                                           | 100°F to 1200°F                                          | 500°F to 1800°F                                                                 |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                       | 200°F - 0.4, 300°F - 0.3                                 | 500°F - 0.54 max                                         | 500°F - 0.77 max                                                                |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11-14 lb per cu ft                                       | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                              |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                                          |                                                                                 |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                          | Machine molded or extruded. Pipe mach cut on diameter.   | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                      |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                             | Good                                                     | Good                                                     | Good                                                                            |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                     | ASTM **                                                  | ASTM **                                                  | To Specification                                                                |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          | Good mechanical strength with low shrinkage.             |                                                                                 |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                           |                                                          |                                                          |                                                                                 |
| *Bands are supplied or extra cost. Order must state "with our bands" if not required.<br>For 11" IPS and larger there is an additional charge for 2-in. convex cover. Material should be specified "without 2-in. convex" to avoid extra charge.<br>**New Simplified Dimensional System sponsored by ASTM<br>***Fiber Board Paper Products Corp<br>† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. | 85% Mag<br>Phillip Carey Mfg Co                          | Calcilite<br>The Ruberoid Co                             | High Temp. No. 19<br>Phillip Carey Mfg Co                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                | Thermalite 85%<br>Ehrer Mag Mfg Co, Inc                  | Kaylo<br>Owens-Illinois Glass Co                         | Enduro Hi-Temp.<br>Ehrer Mag Mfg Co, Inc                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                | 85% Mag.<br>Johns-Manville Sales Corp                    | Thermobestos<br>Johns-Manville Sales Corp                | J/M Superon<br>Johns-Manville Sales Corp                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Keytherm<br>Kossby & Morrison Co                         | High Temp.<br>Kossby & Morrison Co                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                | Featherweight<br>Kossby & Morrison Co                    | Incalite<br>Mundt Clark Corp                             |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                | 85% Mag<br>Mundt Clark Corp                              | Calcemp<br>Pabco Ind Ins Div ***                         |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                | Precision-molded<br>Pabco Ind Ins Div ***                |                                                          |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                          |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                          |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                          |                                                                                 |
| Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority retaining the use of this Specification.                                                                                                                                                                                                                      |                                                          |                                                          |                                                                                 |

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REV. JUL 1959 SUP. BY

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|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Page 2                                                                                                                                                               |                                                              | MATERIAL SPECIFICATION - SERIES 100 |                                                                                                                                                                           | OCTOBER 1954  |
| Code                                                                                                                                                                 |                                                              | 104                                 | 106                                                                                                                                                                       | Rev Sept 1953 |
| Material                                                                                                                                                             | Inorganic silicates                                          |                                     | Asbestos and diatomaceous earth mixed                                                                                                                                     |               |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |                                     | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |               |
| Filler                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |               |
| Binder                                                                                                                                                               |                                                              |                                     |                                                                                                                                                                           |               |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |                                     | 200°F to 1200°F                                                                                                                                                           |               |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |                                     | 500°F - 0.54 max                                                                                                                                                          |               |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     | 18 lbs per cu ft                                                                                                                                                          |               |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |                                     | 11 PSI at 5% deformation - Dry                                                                                                                                            |               |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |                                     | Formed and cased on mandril. Pipe mach cut on die                                                                                                                         |               |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |                                     | Good                                                                                                                                                                      |               |
| Dimensions                                                                                                                                                           |                                                              |                                     |                                                                                                                                                                           |               |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                     |                                                                                                                                                                           |               |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kaylo 20 is 1800°F                                                                    | Alltemp                                                      |                                     | Unibestos                                                                                                                                                                 |               |
|                                                                                                                                                                      | Phillips Carey Co                                            |                                     | Union Asbestos & Rubber Co                                                                                                                                                |               |
|                                                                                                                                                                      | Kaylo 20                                                     |                                     |                                                                                                                                                                           |               |
|                                                                                                                                                                      | Owens-Illinois Glass Co                                      |                                     |                                                                                                                                                                           |               |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |               |
|                                                                                                                                                                      |                                                              |                                     |                                                                                                                                                                           |               |
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| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                             | THERMAL INSULATION<br>STANDARD ENGINEERING SPECIFICATION |                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------|
| MATERIAL SPECIFICATION<br>SERIES 100<br>PREFORMED BLOCK AND PIPE                                                                                                                                                                                                                                                                                                                                                                                          |                                                             | ISSUED<br>OCT 1954                                       | SN 100 M<br>Page 1 of 14                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             | REVISED<br>JULY 1959                                     |                                                                               |
| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 101*                                                        | 102*                                                     | 103                                                                           |
| Material                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 85% Magnesia                                                | Calcium silicate                                         | Diatomaceous earth                                                            |
| Material Description                                                                                                                                                                                                                                                                                                                                                                                                                                      | Hydrated basic magnesium carbonate<br>80% by weight minimum | Staple, cellular, calcined fire clay base                | Diatomaceous earth, asbestos fiber, with bonding clay and cementing materials |
| Filler                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Asbestos or glass fiber                                     |                                                          |                                                                               |
| Binder                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Clay or other cementing materials 5% by weight              |                                                          |                                                                               |
| Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                                         | 100°F to 500°F                                              | 100°F to 1200°F                                          | 500°F to 1800°F                                                               |
| K Factor                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 200°F - 0.4, 500°F - 0.5                                    | 500°F - 0.54 max                                         | 500°F - 0.77 max                                                              |
| Density                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 11-14 lb per cu ft                                          | 11 lb per cu ft                                          | 24-27 lb per cu ft                                                            |
| Compressive Strength                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                          |                                                                               |
| Manufacturing Process                                                                                                                                                                                                                                                                                                                                                                                                                                     | Machine molded or extru. Pipe mach cut on diameter.         | Machine extruded. Pipe mach cut on diameter.             | Machine molded. Pipe mach cut on diameter.                                    |
| Resistance to Breakage in Handling                                                                                                                                                                                                                                                                                                                                                                                                                        | Good                                                        | Good                                                     | Good                                                                          |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                                                                                                | ASTM **                                                     | ASTM **                                                  | To Specification                                                              |
| Other Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             | Good mechanical strength with low shrinkage.             |                                                                               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.                                                                                                                                                                                                                                                                                      |                                                             |                                                          |                                                                               |
| *Bands are supplied at extra cost. Order must state "without bands" if not required.<br><br>For 11" IPS and larger there is an additional charge for 2-x canvas cover. Material should be specified "without 2-x canvas" to avoid extra charge.<br><br>**New Simplified Dimensional System sponsored by ASTM<br><br>***Fiber Board Paper Products Corp<br><br>† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications. | 85% Mag<br>Philip Carey Mfg Co                              | Calcisite<br>The Ruberoid Co                             | High Temp No. 19<br>Philip Carey Mfg Co                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Thermalite 85%<br>Ehrst Mag Mfg Co, Inc                     | Kaylo<br>Owens-Corning Corp                              | Enduro Hi-Temp.<br>Ehrst Mag Mfg Co, Inc                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 85% Mag.<br>Johns-Manville Sales Corp                       | Thermobestos<br>Johns-Manville Sales Corp                | J/M Supers<br>Johns-Manville Sales Corp                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             | Kaytherm<br>Keesby & Mattison Co                         | High Temp.<br>Keesby & Mattison Co                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Featherweight<br>Keesby & Mattison Co                       | Tricalite<br>Mundt Cork Corp                             |                                                                               |
| 85% Mag<br>Mundt Cork Corp                                                                                                                                                                                                                                                                                                                                                                                                                                | Caltemp<br>Pabco Ind Ins Div ***                            |                                                          |                                                                               |
| Precision-molded<br>Pabco Ind Ins Div ***                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                             |                                                          |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |                                                          |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |                                                          |                                                                               |

DUP 0960860

Vendors and merchandise designations are given to describe materials and may not include all acceptable products. Substitutions are to be made only on approval of the authority initiating the use of this Specification.

SUBCOMMITTEE NO. 28



# TWINJULIES

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|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SN 100 M                                                                                                                                                             |                                                              | MATERIAL SPECIFICATION - SERIES 100 |  | OCTOBER 1954                                                                                                                                                              |
| Page 2                                                                                                                                                               |                                                              |                                     |  | Rev July 1959                                                                                                                                                             |
| Code                                                                                                                                                                 | 104                                                          |                                     |  | 106                                                                                                                                                                       |
| Material                                                                                                                                                             | Inorganic silicates                                          |                                     |  | Asbestos and diatomaceous earth molded                                                                                                                                    |
| Material Description                                                                                                                                                 | Inorganic silicas and asbestos fibers                        |                                     |  | Compressed fluffy asbestos sprayed with sodium silicate and diatomaceous earth sprinkled on the asbestos mat. External finish consists of an integral refractory coating* |
| Filler                                                                                                                                                               |                                                              |                                     |  |                                                                                                                                                                           |
| Binder                                                                                                                                                               |                                                              |                                     |  |                                                                                                                                                                           |
| Temperature Range                                                                                                                                                    | 100°F to 1600°F**                                            |                                     |  | 200°F to 1200°F                                                                                                                                                           |
| K Factor                                                                                                                                                             | Pipe covering - 500°F - 0.64 max<br>Block - 500°F - 0.58 max |                                     |  | 500°F - 0.54 max                                                                                                                                                          |
| Density                                                                                                                                                              | Pipe covering - 15 lb per cu ft<br>Block - 14 lb per cu ft   |                                     |  | 18 lbs per cu ft                                                                                                                                                          |
| Compressive Strength                                                                                                                                                 | 65 lbs per sq in. min at 5% deformation                      |                                     |  | 11 PSI at 5% deformation - Dry                                                                                                                                            |
| Manufacturing Process                                                                                                                                                | Filter moulding process                                      |                                     |  | Formed and comp. on mandril. Pipe mach cut on die                                                                                                                         |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                         |                                     |  | Good                                                                                                                                                                      |
| Dimensions                                                                                                                                                           |                                                              |                                     |  |                                                                                                                                                                           |
| Other Qualifications                                                                                                                                                 | Good mechanical strength. Shrinkage less than 2% at 1600°F   |                                     |  | Formed on a mandril to a predetermined wt. Pressed to obtain the desired density, and baked.                                                                              |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                              |                                     |  |                                                                                                                                                                           |
| * Available for field mixing to repair joints and seams.<br><br>** Max temp of Kayla 20 is 1800°F                                                                    | Alltemp Philip Carey Co                                      |                                     |  | Unibestos Union Asbestos & Rubber Co                                                                                                                                      |
|                                                                                                                                                                      | Kayla 20 Owens-Corning Corp                                  |                                     |  |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
|                                                                                                                                                                      |                                                              |                                     |  |                                                                                                                                                                           |
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DUP 0960861

145

| OCTOBER 1954                                                                                                                                                         |                                                                                          | MATERIAL SPECIFICATION - SERIES 100 |                                                                                            | SN 100 M |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------|----------|
| Rev Sept 1950                                                                                                                                                        |                                                                                          |                                     |                                                                                            | Page 3   |
| Code                                                                                                                                                                 | 107                                                                                      | 108                                 | 109                                                                                        |          |
| Material                                                                                                                                                             | Asbestos sponge                                                                          |                                     | Corrugated asbestos preshrunk                                                              |          |
| Material Description                                                                                                                                                 | Asbestos sheets separated by finely ground sponged material bonded with adhesive strips. |                                     | Alternate layers of plain and corrugated asbestos sheets.<br>Outer covering asbestos felt. |          |
| Filler                                                                                                                                                               |                                                                                          |                                     |                                                                                            |          |
| Binder                                                                                                                                                               |                                                                                          |                                     |                                                                                            |          |
| Temperature Range                                                                                                                                                    | 100°F to 700°F                                                                           |                                     | 100°F to 400°F                                                                             |          |
| K Factor                                                                                                                                                             | 500°F - 0.60 max                                                                         |                                     | 200°F - 0.58 max                                                                           |          |
| Density                                                                                                                                                              | 30 lb max                                                                                |                                     |                                                                                            |          |
| Compressive Strength                                                                                                                                                 |                                                                                          |                                     |                                                                                            |          |
| Manufacturing Process                                                                                                                                                | Laminated - 38 to 42 layers per in. of thickness                                         |                                     | 3-ply laminate                                                                             |          |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                |                                     | Good                                                                                       |          |
| Dimensions                                                                                                                                                           | To Specification                                                                         |                                     |                                                                                            |          |
| Other Qualifications                                                                                                                                                 | Must be a flexible product                                                               |                                     | Preshrunk                                                                                  |          |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                          |                                     |                                                                                            |          |
| * Aircell -4-ply<br>Excel -6-ply<br>Cavacel-8-ply                                                                                                                    | Asbestos Sponge                                                                          |                                     | Preshrunk Asbestoscel                                                                      |          |
|                                                                                                                                                                      | Johns-Manville Sales Corp                                                                |                                     | Johns-Manville Sales Corp                                                                  |          |
|                                                                                                                                                                      | Asbestos Sponge                                                                          |                                     | Aircell *                                                                                  |          |
|                                                                                                                                                                      | Philip Carey Mfg Co                                                                      |                                     | Philip Carey Mfg Co                                                                        |          |
|                                                                                                                                                                      | Sponge Felt                                                                              |                                     | K & M - Aircell                                                                            |          |
|                                                                                                                                                                      | The Ruberoid Co                                                                          |                                     | Keesbey & Mettison Co                                                                      |          |
|                                                                                                                                                                      | Sponge Felt                                                                              |                                     | B-H Aircell                                                                                |          |
|                                                                                                                                                                      | Ehrst Mfg Mfg Co, Inc                                                                    |                                     | Baldwin-Hill Co                                                                            |          |
| Sponge Felt                                                                                                                                                          |                                                                                          |                                     |                                                                                            |          |
| Smith and Kensler Corp                                                                                                                                               |                                                                                          |                                     |                                                                                            |          |
| CONFIDENTIAL                                                                                                                                                         |                                                                                          |                                     |                                                                                            |          |
|                                                                                   |                                                                                          |                                     |                                                                                            |          |
| DUP 0960862                                                                                                                                                          |                                                                                          |                                     |                                                                                            |          |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------|---------------|
| SN 100 M                                                                                                                                                             |                                                                                                                                                         | MATERIAL SPECIFICATION - SERIES 100                    |                                 | OCTOBER 1954  |
| Page 4                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 | Rev Sept 1950 |
| Code                                                                                                                                                                 | 110                                                                                                                                                     | 111                                                    | 112                             |               |
| Material                                                                                                                                                             | Vegetable cork                                                                                                                                          | Cellular glass                                         | Glass fiber                     |               |
| Material Description                                                                                                                                                 | Vegetable cork, granulated and compressed into cork-board or molded forms, from material of vegetable origin for low and medium temperature insulation. | Cellular glass foamed and fused into unicellular form. | See codes 112.01 through 112.81 |               |
| Filler                                                                                                                                                               |                                                                                                                                                         |                                                        |                                 |               |
| Binder                                                                                                                                                               | Natural resin in cork                                                                                                                                   |                                                        |                                 |               |
| Temperature Range                                                                                                                                                    | -200°F to 100°F                                                                                                                                         | -200°F to 100°F<br>(+300°F for dual temp)              |                                 |               |
| K Factor                                                                                                                                                             | 100°F - 0.29 max                                                                                                                                        | 100°F - 0.43 max                                       |                                 |               |
| Density                                                                                                                                                              | 9 - 11 lb per cu ft                                                                                                                                     | 10 - 11 lb per cu ft                                   |                                 |               |
| Compressive Strength                                                                                                                                                 | 15 lb per sq in. min                                                                                                                                    | 35 lb per sq in. min                                   |                                 |               |
| Manufacturing Process                                                                                                                                                | Machine comp or molded. Baked at moderate temp                                                                                                          |                                                        |                                 |               |
| Resistance to Breakage in Handling                                                                                                                                   | Good                                                                                                                                                    |                                                        |                                 |               |
| Dimensions                                                                                                                                                           |                                                                                                                                                         |                                                        |                                 |               |
| Other Qualifications                                                                                                                                                 | Pipe covering shall be coated on the outside with heavy mastic                                                                                          |                                                        |                                 |               |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                         |                                                        |                                 |               |
| CONFIDENTIAL                                                                                                                                                         | Cork                                                                                                                                                    | Foamglas                                               |                                 |               |
|                                                                                                                                                                      | Armstrong Cork Co                                                                                                                                       | Pittsburgh Coming Corp                                 |                                 |               |
|                                                                                                                                                                      | Cork                                                                                                                                                    |                                                        |                                 |               |
|                                                                                                                                                                      | Mundet Cork Co                                                                                                                                          |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
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|                                                                                                                                                                      |                                                                                                                                                         |                                                        |                                 |               |
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146

R.V. 11-1-54

DUP 0960863



V V X Y Z A - 52

|                                                                                                                                                                      |                                                                                       |                                     |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|--|
| OCTOBER 1954                                                                                                                                                         |                                                                                       | SN 100 M                            |  |
| Rev Dec 1958                                                                                                                                                         |                                                                                       | MATERIAL SPECIFICATION - SERIES 100 |  |
|                                                                                                                                                                      |                                                                                       | Page 5                              |  |
| Code                                                                                                                                                                 | 112.01                                                                                | 112.02                              |  |
| Material                                                                                                                                                             | Glass fiber                                                                           | See Code 112.01                     |  |
| Material Description                                                                                                                                                 | Textile type fine glass fiber pipe insulation, plain, with medium-temperature binder. |                                     |  |
| Filler                                                                                                                                                               |                                                                                       |                                     |  |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                          |                                     |  |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                         |                                     |  |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                          |                                     |  |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                |                                     |  |
| Compressive Strength                                                                                                                                                 |                                                                                       |                                     |  |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                        |                                     |  |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                             |                                     |  |
| Dimensions                                                                                                                                                           |                                                                                       |                                     |  |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing                                        |                                     |  |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                       |                                     |  |
| CONFIDENTIAL                                                                                                                                                         | *Ultrafine Snap-on<br>Gustin-Bacon Mfg Co                                             |                                     |  |
|                                                                                                                                                                      | *Mono-Kover<br>Baldwin-Hill                                                           |                                     |  |
|                                                                                                                                                                      | *Thermoglas<br>Philip Cary Mfg Co                                                     |                                     |  |
|                                                                                                                                                                      | **Fiberglas<br>Owens-Corning Corp                                                     |                                     |  |
|                                                                                                                                                                      | **Armoglas PF Pipe Insu<br>Armstrong Cork Co                                          |                                     |  |
|                                                                                                                                                                      | *Aerogel<br>Johns-Manville Sales Corp                                                 |                                     |  |
|                                                                                                                                                                      |                                                                                       |                                     |  |
|                                                                                                                                                                      |                                                                                       |                                     |  |
|                                                                                                                                                                      |                                                                                       | DUP 0960864                         |  |



Z A 53

| SN 100 M                                                                                                                                                             |                                                                                                                                                                                | MATERIAL SPECIFICATION - SERIES 100 |  | OCTOBER 1954   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--|----------------|
| Page 6                                                                                                                                                               |                                                                                                                                                                                |                                     |  | Rev. Oct. 1959 |
| Code                                                                                                                                                                 | 112.11                                                                                                                                                                         | 112.12                              |  |                |
| Material                                                                                                                                                             | Glass fiber                                                                                                                                                                    | See 112.11                          |  |                |
| Material Description                                                                                                                                                 | Textile type fine glass fiber bonded pipe insulation with 30-lb factory-applied roofing felt finish on sizes 6" and smaller and 45-lb felt on sizes above 6" outside diameter. |                                     |  |                |
| Filler                                                                                                                                                               |                                                                                                                                                                                |                                     |  |                |
| Binder                                                                                                                                                               | Phenol-formaldehyde or Di-Cy                                                                                                                                                   |                                     |  |                |
| Temperature Range                                                                                                                                                    | 80°F to 350°F                                                                                                                                                                  |                                     |  |                |
| K Factor                                                                                                                                                             | 100°F - 0.25                                                                                                                                                                   |                                     |  |                |
| Density                                                                                                                                                              | 3" and 6" lb per cu ft                                                                                                                                                         |                                     |  |                |
| Compressive Strength                                                                                                                                                 |                                                                                                                                                                                |                                     |  |                |
| Manufacturing Process                                                                                                                                                | Machine molded                                                                                                                                                                 |                                     |  |                |
| Resistance to Breakage in Handling                                                                                                                                   | Very good                                                                                                                                                                      |                                     |  |                |
| Dimensions                                                                                                                                                           |                                                                                                                                                                                |                                     |  |                |
| Other Qualifications                                                                                                                                                 | Specify whether for iron pipe or copper tubing, 30-lb felt used up to 6" OD of insulation                                                                                      |                                     |  |                |
| The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications. |                                                                                                                                                                                |                                     |  |                |
| * Order must specify finish noted under Material Description.                                                                                                        | * Ultrafine Snap-on Gustin-Bacon Mfg Co                                                                                                                                        |                                     |  | CONFIDENTIAL   |
|                                                                                                                                                                      | * Mono-Kover Baldwin-Hill                                                                                                                                                      |                                     |  |                |
|                                                                                                                                                                      | * Thermoglas Philip Carey Mfg Co                                                                                                                                               |                                     |  |                |
|                                                                                                                                                                      | * Fiberglas Owens-Corning Corp                                                                                                                                                 |                                     |  |                |
|                                                                                                                                                                      | * Armaglas PF Pipe Insu Armstrong Cork Co                                                                                                                                      |                                     |  |                |
|                                                                                                                                                                      | * Aerolag Johns-Manville Sales Corp                                                                                                                                            |                                     |  |                |
|                                                                                                                                                                      | * PPG Glass Fiber Pitts Plate Glass Co                                                                                                                                         |                                     |  |                |
|                                                                                                                                                                      | * Micro-Lok J-M Fiber Glass, Inc                                                                                                                                               |                                     |  |                |
|                                                                                   |                                                                                                                                                                                |                                     |  | DUP 0960865    |