

87

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED APRIL 1960	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	Stable, cellular, calcined fire clay base	Diatomaceous earth, asbestos fiber, with portland cement 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 - 0.54 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 at extra cost. Order must state "with or without bands" if not required. 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. **New Simplified Dimensional System sponsored by ASTM ***Fiber Board Paper Products Corp † Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.	85% Mag Phillips Carey Mfg Co	Calcilite The Ruberoid Co	High Temp No. 19 Phillips Carey Mfg Co
	Thermalite 85% Baldwin-Ehren-Hill, Inc	Keylo Owens-Corning Corp	Enduro Hi-Temp. Baldwin-Ehren-Hill, Inc
	85% Mag. Johns-Manville Sales Corp	Thermobestos Johns-Manville Sales Corp	J/M Superes Johns-Manville Sales Corp
		Keytherm Keesby & Morrison Co	High Temp. Keesby & Morrison Co
	Femhermights Keesby & Morrison Co	Tricelise Mundt Clark Corp	
	85% Mag Mundt Clark Corp	Caltemp Pebes Ind Ins Div ***	
	Precision-molded Pebes Ind Ins Div ***	Carystone Phillips Carey Mfg Co	

DUP 0990049

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.

048074

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 Block - 500°F - 0.58 max	500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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. ** Max temp of Kevlar 20 is 1800°F		Unibestos Union Asbestos & Rubber Co
	Kevlar 20	
	Owens-Corning Corp	

DUP 0990050



048875

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED APRIL 1960	Page 1 of 14
Code	101*	102*	103
Material	85% Magnesite	Calcium silicate	Diatomaceous earth
Material Description	Hydrated basic magnesium carbonate 90% 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, 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	12-27 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.			
*Bones are supplied at extra cost. Order must state "without bones" if not required.	85% Mag Phillip Carey Mfg Co	Calcisite The Ruberoid Co	High Temp No. 19 Phillip Carey Mfg Co
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.	Thermalite 85% Baldwin-Ehrst-Hill, Inc	Keylo Owens-Corning Corp	Enduro H-Temp. Baldwin-Ehrst-Hill, Inc
**New Simplified Dimensional System sponsored by ASTM	85% Mag. Johns-Manville Sales Corp	Thermobestos Johns-Manville Sales Corp	J/V Supers Johns-Manville Sales Corp
***Fiber Board Paper Producers Corp		Keytherm Keesby & Mattison Co	High Temp. Keesby & Mattison Co
† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.	Featherweight Keesby & Mattison Co	Incaluse Munder Cork Corp	
	85% Mag Munder Cork Corp	Callomp Pabco Ind Ins Div ***	
	Precision-molded Pabco Ind Ins Div ***	Cerexems Phillip Carey Mfg Co	

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.

SM 100 M		OCTOBER 1954	
Page 2		Rev April 1960	
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 - 0.54 max Block - 500°F - 0.58 max		500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 mandrel 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. ** Max temp of Kaylo 20 is 1800°F			Unabestos Union Asbestos & Rubber Co
	Kaylo 20		
	Owens-Corning Corp		



MATERIALS

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

**THERMAL INSULATION
STANDARD ENGINEERING SPECIFICATION**

ISSUED OCT 1954

REVISED APRIL 1960

SN 100 M

Page 1 of 14

Code	101*	102**	103
Material -	85% Magnesite	Calcium silicate	Diatomaceous earth
Material Description	Hydrated basic magnesium carbonate 50% by weight minimum	Staple, cellular, calcined fire clay base	Diatomaceous earth, asbestos fiber, with or 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 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 at extra cost. Order must state "with-out bands" if not required.	85% Mag Phillip Carey Mfg Co	Calcisite The Ruberoid Co	High Temp No. 19 Phillip 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% Baldwin-Ehren-Hill, Inc	Keylo Quens-Corning Corp	Enduro Hi-Temp. Baldwin-Ehren-Hill, Inc
**New Simplified Dimensional System sponsored by ASTM	85% Mag. Johns-Manville Sales Corp	Thermobestos Johns-Manville Sales Corp	J/M Supers Johns-Manville Sales Corp
***Pillar Board Paper Products Corp		Keytherm Keesby & Morrison Co	High Temp. Keesby & Morrison Co
† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.	Featherweight Keesby & Morrison Co	Tricalite Mundt Clark Corp	
	85% Mag Mundt Clark Corp	Calcisite Pebes Ind Ins Div ***	
	Precision-molded Pebes Ind Ins Div ***	Carystone Phillip Carey Mfg Co	

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.

SUGGESTED MS. 28



R-170

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DUP 0990277

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Code	104	106
Material	Inorganic silicates	Asbestos and diatomaceous earth matted
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	Block - 500°F - 0.58 max	500°F - 0.54 max
Density	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 mandrel 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. ** Max temp of Kayle 20 is 1800°F		Unibestos Union Asbestos & Rubber Co
	Kayle 20 Block	
	Quens-Corning Cars	



111

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DUP 0990278

048383

Code	101*	102*	103
Material	85% Magnesite	Calcium silicate	Diatomaceous earth
Material Description	Hydrated basic magnesium carbonate 85% by weight minimum	Stable, cellular, calcined fire clay base	Diatomaceous earth, asbestos fiber, with 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 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 supplied on extra cover. Order must state "with out bands" 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 Phillip Carey Mfg Co	Calcilite The Ruberoid Co	High Temp No. 19 Phillip Carey Mfg Co
**New Simplified Dimensional System sponsored by ASTM	Thermalite 85% Baldwin-Ehren-Hill, Inc	Kaylo Owens-Corning Corp	Enduro Hi-Temp. Baldwin-Ehren-Hill, Inc
***Pilot Board Paper Products Corp	85% Mag. Johns-Manville Sales Corp	Thermabestos Johns-Manville Sales Corp	J/M Supers Johns-Manville Sales Corp
		Kayschem Kaysby & Morrison Co	High Temp. Kaysby & Morrison Co
	Featherweight Kaysby & Morrison Co	Truallite Munder Clark Corp	
	85% Mag Munder Clark Corp	Calcamp Pebax Ind Inc Div ***	
	Pressure-molded Pebax Ind Inc Div ***	Coroxene Phillip Carey Mfg Co	

† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.

Vendors and merchandise descriptions are given to describe material and may not include all conceivable products. Submissions are to be made only on approval of the authority increasing the use of this specification.

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DUP 0990364

048389

B-219

Code	104	106
Material	Inorganic silicates	Asbestos and diatomaceous earth matted
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 - 0.54 max Block - 500°F - 0.58 max	500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 cased 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. ** Max temp of Kevlar 20 is 1800°F		Unabestos Union Asbestos & Rubber Co
	Kevlar 20	
	Owens-Corning Corp	

DUP 0990365

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

THERMAL INSULATION
 STANDARD ENGINEERING SPECIFICATION

ISSUED OCT 1954
REVISED APRIL 1955

SN 100 M
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	Stable, 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 = 0.5	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 mech cut on diameter.	Machine extruded. Pipe mech cut on diameter.	Machine molded. Pipe mech 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 Reid 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 out bonds" if not required.	85% Vag Philip Carey Mfg Co	Calcelite The Ruberoid Co	High Temp No. 19 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% Baldwin-Ehren-Hill, Inc	Kaylo Owens-Corning Corp	Enduro Hi Temp. Baldwin-Ehren-Hill, Inc
	85% Vag. Johns-Manville Sales Corp	Thermobestos Johns-Manville Sales Corp	1/4 Superz Johns-Manville Sales Corp
		Keytherm Keesby & Morrison Co	High Temp. Keesby & Morrison Co
**New Simplified Dimensional System sponsored by ASTM	Featherlight Keesby & Morrison Co	Tricelase Mundt Clark Corp	
***Fiber Board Paper Products Corp	85% Vag Mundt Clark Corp	Caltemp Pabco Ind Ins Div ***	
† Codes 104 and 106 are acceptable alternatives unless noted on the Product Specifications.	Precision-molded Pabco Ind Ins Div ***	Careytens Philip Carey Mfg Co	

DUP 099044

Vendors and merchandise descriptions are given to describe material and may not include all conceivable products. Substitutions are to be made only on orders of the authority initiating the use of this specification.

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R-267

DUP 0990448

048473

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	Block - 500°F - 0.58 max	500°F - 0.54 max
Density	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 mandrel 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. ** Max. temp. of Kaylo 20 is 1800°F		Unabestos Union Asbestos & Rubber Co
	Kaylo 20 Block Quens-Corning Corp	

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87

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954 REVISED APRIL 1960	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 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 "with out bonds" if not required. For 11" IPS and larger there is an additional charge for 2-as canvas cover. Material should be specified "without 2-as canvas" to avoid extra charge.	85% Mag Philip Carey Mfg Co Thermalite 85% Baldwin-Ehrer-Hill, Inc	Calcilite The Ruberoid Co Kaylo Owens-Corning Corp	High Temp No. 19 Philip Carey Mfg Co Enduro Hi-Temp. Baldwin-Ehrer-Hill, Inc
**New Simplified Dimensional System sponsored by ASTM	85% Mag. Johns-Manville Sales Corp	Thermobestos Johns-Manville Sales Corp	I/M Superes Johns-Manville Sales Corp
***Fiber Board Paper Products Corp	Featherweight Keesby & Mattison Co	Keytherm Keesby & Mattison Co	High Temp. Keesby & Mattison Co
† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.	85% Mag Mundet Cork Corp	Incalite Mundet Cork Corp	
	Precision-molded Pabco Ind Ins Div ***	Caltemp Pabco Ind Ins Div ***	
		Careysens Philip Carey Mfg Co	

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477

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MIDLAND

DUP 0990915

090501

SN 100 M		OCTOBER 1954	
Page 2		MATERIAL SPECIFICATION - SERIES 100	
		Rev April 1960	
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 Block - 500°F - 0.58 max		500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 comp on mandrel. 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. ** Max temp of Kaylo 20 is 1800°F			Unibestos Union Asbestos & Rubber Co
	Kaylo 20 Owens-Corning Corp		
478			

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev April 1960				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. 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 Excel -6-ply Caucel-8-ply	Asbestos Sponge Johns-Manville Sales Corp		Preshrunk Asbestoscel Johns-Manville Sales Corp	
	Asbestos Sponge Philip Carey Mfg Co		Aircell Philip Carey Mfg Co	
	Sponge Felt The Ruberoid Co		K & M - Aircell Keasbey & Mattison Co	
	Sponge Felt Baldwin-Ehret-Hill, Inc		B-H Aircell Baldwin-Ehret-Hill, Inc	
	Sponge Felt Smith and Kensler Corp			

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 4				Rev April 1960
Code	110	111	111.1	
Material	Vegetable cork	Cellular glass	Cellular glass	
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.	Cellular glass foamed and fused into unicellular form. Factory-applied jacket having white kraft paper outer jacket (60 lb per 3000 sq ft) backed by 0.00035" aluminum foil	
Filler				
Binder	Natural resin in cork			
Temperature Range	-200°F to 100°F	-200°F to 100°F (+300°F for dual temp)	+35°F to +300°F	
K Factor	100°F - 0.29 max	100°F - 0.43 max	100°F - 0.43 max	
Density	9 - 11 lb per cu ft	10 - 11 lb per cu ft	9 lb per cu ft	
Compressive Strength	15 lb per sq in. min	100 lb per sq in. min	100 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 Armstrong Cork Co	Foamglas Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp	
	Cork Mundt Cork Co			

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91

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev April 1960				Page 41
Code	111.2	111.3	112	
Material	Cellular glass	Cellular glass	Glass fiber	
Material Description	Cellular glass foamed and fused into unicellular form. Factory applied jacket having 0.00035" aluminum foil outer jacket backed by kraft paper (60 lb per 3000 sq ft)	Cellular glass foamed and fused into unicellular form. Plain - without jacket.	See Codes 112.01 through 112.81.	
Filler				
Binder				
Temperature Range	+35°F to +300°F	+35°F to +300°F		
K Factor				
Density	9 lb per cu ft	9 lb per cu ft		
Compressive Strength	100 lb per sq in. min	100 lb per sq in. min		
Manufacturing Process				
Resistance to Breakage in Handling				
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.				
481	Foamglas Stay-Dry Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp		

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93

OCTOBER 1954		SN 100 M	
Rev April 1960		Page 5	
MATERIAL SPECIFICATION - SERIES 100			
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.			
452	* Ultrafine Snap-on Gustin-Bacon Mfg Co		
	* Mono-Kover Baldwin-Ehret-Mill, Inc		
	* Thermoglas Philip Cary Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armoglas PF Pipe Insu Armstrong Cork Co		
	* Micro-Lok Johns-Manville Sales Corp		

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DUP 0990920

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SM 100 M		OCTOBER 1954	
Page 6		MATERIAL SPECIFICATION - SERIES 100	
		Rev April 1960	
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-Ehret-Hill, Inc		
	* Thermoglas Philip Carey Mfg Co		
	* Fiberglas Owens-Corning Corp		
	* Armaglas PF Pipe Insu Armstrong Cork Co		
	* Micro-Lok Johns-Manville Sales Corp		
	* PPG Glass Fiber Pitts Plate Glass Co		
483			

28:

REV. 10/54

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OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev. April 1960			
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" 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.			
484	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Vono-Kover Baldwin-Ehret-Mill, Inc	*Vono-Kover Baldwin-Ehret-Mill, Inc	
	*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	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	

DUP 0990922



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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 2		Rev April 1960		
Code	112.21	112.22	112.23	
Material	Glass fiber	Glass fiber	Glass fiber	
Material Description	Textile type fine glass fiber banded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish.	Textile type fine glass fiber banded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish.	Textile type fine glass fiber banded 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 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.				
485	*Ultrafine Snap-on Gustin-Bocan Mfg Co	*Ultrafine Snap-on Gustin-Bocan Mfg Co	Universal Jacket Owens-Corning Corp	
	*Meno-Kover Baldwin-Ehrer-Hill, Inc	*Meno-Kover Baldwin-Ehrer-Hill, Inc		
	*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		
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp		
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co		

96

DUP 0990923

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97

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev April 1960

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" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		Length - 36" Width - 6" or 12" 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.			
486	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		Fiberglas Block Insulation Owens-Corning Corp
	Armatemp Spun Wool Duct - Plain Armstrong Cork Co		Armoglas Block Insulation Armstrong Cork Co
	Spintex No. 414 or 415 Johns-Manville Sales Corp		
	Spunduct Baldwin-Ehret-Hill, Inc		

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SN 100 M		OCTOBER 1954	
Page 10		Rev April 1960	
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 3/4" to 2" thickness		24" x 48" boards 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.			
487	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armstrong Spun Seal Duct - Faced V/B Armstrong Cork Co		Armstrong Spun Seal Duct - Coated Armstrong Cork Co
	Spinsax No. 414 VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	Spunduct Baldwin-Ehret-Hill, Inc		

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OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev April 1960

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.

488		PV Superemp Eagle-Picher	Rock Cork Johns-Manville Sales Corp
		Mono-Block Baldwin-Ehrst-Hill, Inc	Mineral Wool Board Armstrong Cork Co
		Armatemp Armstrong Cork Co	Koldboard Baldwin-Ehrst-Hill, Inc
		M F Block M. H. Detrick Co	

DUP 0990926

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SN 100 M

Page 12

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Rev April 1960

Code

116

117

117.1

Material	Flexible foamed plastic	Urethane Foam Resilient	Urethane Foam Resilient
Material Description	Flexible coated 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 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.			
489	Press-O-Cal		Flexfoam
	Prestitite Div		Delaware Ins Co
	American Mariette Corp		Thermax
	Vesco-Cal		Am Cellular Products, Inc
	Virginia Smelting Co		

DUP 0990927

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev Feb 1960				Page 12
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.				
490				

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 14				Rev April 1960
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	2 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.				
491	Flexfoam Delaware Ins Co			
	Thermax Am Cellular Products, Inc			

102

DUP 0990929

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87

MATERIALS		THERMAL INSULATION	
MATERIAL SPECIFICATION		STANDARD ENGINEERING SPECIFICATION	
SERIES 100		ISSUED OCT 1954	SN 100 M
PREFORMED BLOCK AND PIPE		REVISED APRIL 1960	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 - 0.3	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 at extra cost. Order must state "without bands" 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 Philip Carey Mfg Co Thermalite 85% Baldwin-Ehrst-Hill, Inc 85% Mag. Johns-Manville Sales Corp	Calcilite The Ruberoid Co Kaylo Owens-Corning Corp Thermobestos Johns-Manville Sales Corp Kayschem Keesby & Mattison Co	High Temp. No. 19 Philip Carey Mfg Co Enduro H-Temp. Baldwin-Ehrst-Hill, Inc J/M Superex Johns-Manville Sales Corp High Temp. Keesby & Mattison Co
**New Simplified Dimensional System sponsored by ASTM	Featherweights Keesby & Mattison Co	Tricalite Mundt Clark Corp	
***Fiber Board Paper Products Corp	85% Mag Mundt Clark Corp	Calcemp Pabco Ind Ins Div ***	
† Codes 104 and 106 are acceptable alternates unless noted on the Project Specifications.	Precision-molded Pabco Ind Ins Div ***	Careysens Philip Carey Mfg Co	

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492

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 090930

090516

SM 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

Page 2

Rev April 1960

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 Block - 500°F - 0.58 max		500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 camed 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. ** Max temp of Kaylo 20 is 1800°F			Unibestos Union Asbestos & Rubber Co
	Kaylo 20		
	Owens-Corning Corp		

493

493

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev April 1960				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. 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 Excel -6-ply Cawcel-8-ply	Asbestos Sponge Johns-Manville Sales Corp		Preshrunk Asbestocel Johns-Manville Sales Corp	
	Asbestos Sponge Philip Carey Mfg Co		Aircell Philip Carey Mfg Co	
	Sponge Felt The Ruberoid Co		K & M - Aircell Keasbey & Mattison Co	
	Sponge Felt Baldwin-Ehret-Hill, Inc		B-H Aircell Baldwin-Ehret-Hill, Inc	
	Sponge Felt Smith and Kanzler Corp			

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SN 100 M		OCTOBER 1954	
Page 4		Rev April 1960	
MATERIAL SPECIFICATION - SERIES 100			
Code	110	111	111.1
Material	Vegetable cork	Cellular glass	Cellular glass
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.	Cellular glass foamed and fused into unicellular form. Factory-applied jacket having white kraft paper outer jacket (60 lb per 3000 sq ft) backed by 0.00035" aluminum foil
Filler			
Binder	Natural resin in cork		
Temperature Range	-200°F to 100°F	-200°F to 100°F (+300°F for dual temp)	+35°F to +300°F
K Factor	100°F - 0.29 max	100°F - 0.43 max	100°F - 0.43 max
Density	9 - 11 lb per cu ft	10 - 11 lb per cu ft	9 lb per cu ft
Compressive Strength	15 lb per sq in. min	100 lb per sq in. min	100 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 Armstrong Cork Co	Foamglas Pittsburgh Coming Corp	Foamglas Stay-Dry Pittsburgh Coming Corp
	Cork Mundet Cork Co		

495

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91

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev April 1960				Page 4.1
Code	111.2	111.3	112	
Material	Cellular glass	Cellular glass	Glass fiber	
Material Description	Cellular glass foamed and fused into unicellular form. Factory applied jacket having 0.00035" aluminum foil outer jacket backed by kraft paper (60 lb per 3000 sq ft)	Cellular glass foamed and fused into unicellular form. Plain - without jacket.	See Codes 112.01 through 112.81.	
Filler				
Binder				
Temperature Range	+35°F to +300°F	+35°F to +300°F		
K Factor				
Density	9 lb per cu ft	9 lb per cu ft		
Compressive Strength	100 lb per sq in. min	100 lb per sq in. min		
Manufacturing Process				
Resistance to Breakage in Handling				
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.				
496	Foanglas Stay-Dry Pittsburgh Corning Corp	Foanglas Stay-Dry Pittsburgh Corning Corp		

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93

OCTOBER 1954		SM 100 M	
Rev April 1960		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.			
497	*Ultrafine Snap-on Gustin-Bacon Mfg Co		
	*Mono-Kover Baldwin-Ehret-Hill Inc		
	*Thermoglas Philip Cory Mfg Co		
	**Fiberglas Owens-Corning Corp		
	**Armoglas PF Pipe Insu Armstrong Cork Co		
	*Micro-Lok Johns-Manville Sales Corp		

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 6				Rev April 1960
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 matted			
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. 498	* Ultrafine Snap-on Gustin-Bacon Mfg Co			
	* Mono-Kover Baldwin-Ehrst-Mill, Inc			
	* Thermaglas Philip Carey Mfg Co			
	** Fiberglas Owens-Corning Corp			
	** Armaglas PF Pipe Insu Armstrong Cork Co			
	* Micro-Lot* Johns-Manville Sales Corp			
	* PPG Glass Fiber Pitts Plate Glass Co			


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OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev April 1960			
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.			
499	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Vono-Kover Baldwin-Ehret-Hill, Inc	*Vono-Kover Baldwin-Ehret-Hill, Inc	
	*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	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	

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SN 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

Page 8

Rev April 1960

Code	112.21	112.22	112.23
Material	Glass fiber	Glass fiber	Glass fiber
Material Description	Textile type fine glass fiber banded pipe insulation with black factory-applied aluminum laminate vapor-barrier finish.	Textile type fine glass fiber banded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish.	Textile type fine glass fiber banded 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 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.			
500	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	Universal Jacket Owens-Corning Corp
	*Vona-Kover Baldwin-Ehren-Hill, Inc	*Vona-Kover Baldwin-Ehren-Hill, Inc	
	*Thermaglas Philip Carey Mfg Co	*Thermaglas 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	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pima Plate Glass Co	*PPG Glass Fiber Pima Plate Glass Co	

96

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97

OCTOBER 1954

Rev April 1960

MATERIAL SPECIFICATION - SERIES 100

SM 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 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" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		Length - 36" Width - 6" or 12" 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.			
501	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		Fiberglas Block Insulation Owens-Corning Corp
	Armstrong Spun Wool Duct - Plain Armstrong Cork Co		Armstrong Block Insulation Armstrong Cork Co
	Spintex No. 614 or 615 Johns-Manville Sales Corp		
	Spunduct Baldwin-Ehret-Hill, Inc		

DUP 0990939

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SN 100 M		OCTOBER 1954	
Page 10		Rev April 1960	
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 3/4" to 2" thickness		24" x 48" boards 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.			
502	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armstrong Spun Bond Duct - Faced VB Armstrong Cork Co		Armstrong Spun Bond Duct - Coated Armstrong Cork Co
	Spintex No. 414 VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	Spunduct Baldwin-Ehret-Hill, Inc		

98

DUP 0990940

090526

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SM 100 M

Rev April 1960

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.

503		PV Superemp Eagle-Picher	Rock Cork Johns-Manville Sales Corp
		Mono-Block Baldwin-Ehret-Hill, Inc	Mineral Wool Board Armstrong Cork Co
		Armtemp Armstrong Cork Co	Koldboard Baldwin-Ehret-Hill, Inc
		M F Block M. H. Derrick Co	

DUP 0990941



090527

SN 100 M

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 12

Rev April 1960

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 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.			
504	Press-O-Cel Presstite Div American Marietta Corp		Flexfoam Delaware Ins Co
			Thermax Am Cellular Products, Inc
	Vesco-Cel Virginia Smelting Co		

DUP 0990942

090528

OCTOBER 1954

Rev Oct 1960

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Page 13

117	Code	117.1	117.3	
	Material	Urethane Foam Resilient	Urethane Foam Resilient	
	Material Description	Preformed resilient urethane snap-on foam pipe insulation manufactured with Du Pont "Hylone" and polyester or polyether resins	Preformed resilient urethane snap-on foam pipe insulation manufactured with Du Pont "Hylone" and polyester or polyether resins and kraft aluminum factory-applied vapor-barrier jacket incorporating a fire-snuff adhesive	
	Filler			
	Binder			
	Recommended Service Temperature Range	45°F to 150°F	45°F to 150°F	
	K Factor	0.27 max at 75°F	0.27 max at 75°F	
	Density	2 to 4 lb per cu ft	2 to 4 lb per cu ft	
	Compressive Strength	Min 0.25 psi at 25% deformation measured parallel to the direction in which the foam rose during manufacture		
	Manufacturing Process	Molded and stabilized dimensionally	Molded and stabilized dimensionally	
	Resistance to Breakage in Handling	Excellent	Excellent	
	Dimensions	± 1/16" - 0" on insulation ID, all others to be accurate to ± 1/16"		
	Other Qualifications	Uniform cell structure. No voids with any dimension exceeding 3/8"	Uniform cell structure. No voids with any dimension exceeding 3/8"	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
505	Flexfoam Delaware Ins Co	Flexfoam Delaware Ins Co		
	Thermal Am. Cellular Products, Inc			

DUP 0990943

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SM 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 14		Rev Oct 1960			
Code		117.6		118	
Material		Urethane Foam Resilient		Urethane Foam Rigid	
Material Description		Preformed resilient urethane foam pipe and fitting insulation manufactured from polyether resin and Du Pont "Hylone" and factory-applied jacket consisting of glass scrim bonded between 1 mil aluminum foil and 1 mil "Toslar"		Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with Du Pont "Hylone" and polyester or polyether resins	
Filler					
Binder					
Recommended Service Temperature Range		45°F to 150°F		-100°F to +150°F	
K Factor		0.27 max at 75°F		0.17 max at 75°F	
Density		2 to 4 lb per cu ft		1 1/2 to 4 lb per cu ft	
Compressive Strength		Min 20 lb per sq in. or 10% deformation, measured parallel to the direction in which the foam rose during manufacture			
Manufacturing Process		Molded and stabilized dimensionally		Molded or cut from molded billet	
Resistance to Breakage in Handling		Excellent		Excellent	
Dimensions		±1/16" - 0" on insulation ID, all others to be accurate to ±1/16"		±1/16" - 0" on insulation ID, all other dimensions to be ±1/16" including straightness and squareness	
Other Qualifications		Uniform cell structure. No voids with any dimension exceeding 1/8"		Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". Heat aging tests max 3.5% volume change; humid aging test max 5% volume change and max 20% compressive strength change in accordance with MIL-P-21929 (SHIPS). Nonburning in accordance with ASTM D 1692. Water absorption max 2% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.					
506		Flexifoam Delaware Ins Co		U-200 Union Asbestos & Rubber Co	
				Gem Foam Baldwin-Ehren-Mill Co	
					



DUP 0990944

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87

MATERIALS		THERMAL INSULATION	
MATERIAL SPECIFICATION		STANDARD ENGINEERING SPECIFICATION	
SERIES 100		ISSUED OCT 1954	SN 100 M
PREFORMED BLOCK AND PIPE		REVISED APRIL 1960	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 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.			
*Bands are supplied at extra cost. Order must state "without bands" if not required.	85% Mag Philip Carey Mfg Co	Calcisite The Ruberoid Co	High Temp No. 19 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% Baldwin-Ehret-Hill, Inc	Kaylo Owens-Corning Corp	Enduro Hi-Temp. Baldwin-Ehret-Hill, Inc
**New Simplified Dimensional System sponsored by ASTM	85% Mag. Johns-Manville Sales Corp	Thermobestos Johns-Manville Sales Corp	J/M Superes Johns-Manville Sales Corp
***Fiber Board Paper Products Corp		Kaytherm Keasby & Mattison Co	High Temp. Keasby & Mattison Co
† Codes 104 and 106 are acceptable alternates unless noted on the Project Specifications.	Featherweight Keasby & Mattison Co	Tricalite Mundt Cork Corp	
	85% Mag Mundt Cork Corp	Caltemp Pabco Ind Ins Div ***	
	Precision-molded Pabco Ind Ins Div ***	Careysma Philip Carey Mfg Co	

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507

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.

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DUP 0990945

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SM 100 M		OCTOBER 1954	
Page 2		Rev April 1960	
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 Block - 500°F - 0.58 max		500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 comp on mandrel. 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. ** Max temp of Kaylo 20 is 1800°F			Unibestos Union Asbestos & Rubber Co
	Kaylo 20		
	Owens-Corning Corp		

88

DUP 0990946

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev April 1960				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. 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 Excel -6-ply Cavocel-8-ply	Asbestos Sponge Johns-Manville Sales Corp		Preshrunk Asbestocel Johns-Manville Sales Corp	
	Asbestos Sponge Philip Carey Mfg Co		Aircell Philip Carey Mfg Co	
	Sponge Felt The Ruberoid Co		K & M - Aircell Keasbey & Mattison Co	
	Sponge Felt Baldwin-Ehret-Hill, Inc		B-H Aircell Baldwin-Ehret-Hill, Inc	
	Sponge Felt Smith and Kanzler Corp			

509

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DUP 0990947

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 4		Rev April 1960		
Code	110	111	111.1	
Material	Vegetable cork	Cellular glass	Cellular glass	
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.	Cellular glass foamed and fused into unicellular form. Factory-applied jacket having white kraft paper outer jacket (60 lb per 3000 sq ft) backed by 0.00035" aluminum foil	
Filler				
Binder	Natural resin in cork			
Temperature Range	-200°F to 100°F	-200°F to 100°F (+300°F for dual temp.)	+35°F to +300°F	
K Factor	100°F - 0.29 max	100°F - 0.43 max	100°F - 0.43 max	
Density	9 - 11 lb per cu ft	10 - 11 lb per cu ft	9 lb per cu ft	
Compressive Strength	15 lb per sq in. min	100 lb per sq in. min	100 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 Armstrong Cork Co	Foamglas Pittsburgh Coming Corp	Foamglas Stay-Dry Pittsburgh Coming Corp	
	Cork Mundet Cork Co			

90

DUP 0990948

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91

OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev April 1960			
SN 100 M			
Page 4.1			
Code	111.2	111.3	112
Material	Cellular glass	Cellular glass	Glass fiber
Material Description	Cellular glass foamed and fused into unicellular form. Factory applied jacket having 0.00035" aluminum foil outer jacket backed by kraft paper (60 lb per 3000 sq ft)	Cellular glass foamed and fused into unicellular form. Plain - without jacket.	See Codes 112.01 through 112.81.
Filler			
Binder			
Temperature Range	+35°F to +300°F	+35°F to +300°F	
K Factor			
Density	9 lb per cu ft	9 lb per cu ft	
Compressive Strength	100 lb per sq in. min	100 lb per sq in. min	
Manufacturing Process			
Resistance to Breakage in Handling			
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.			
	Foamglas Stay-Dry Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp	

511

DUP 0990949

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93

OCTOBER 1954		SN 100 M	
Rev April 1960		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.			
	*Ultrafine Snap-on Gustin-Bacon Mfg Co		
	*Mono-Kover Baldwin-Ehrst-Hill, Inc		
	*Thermoglas Philip Cory Mfg Co		
	**Fiberglas Owens-Corning Corp		
	**Armoglas PF Pipe Insu Armstrong Cork Co		
	*Micro-Lok Johns-Manville Sales Corp		

DUP 0990950

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SN 100 M		OCTOBER 1954	
Page 6		Rev April 1960	
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-Bocan Mfg Co		
	* Vona-Kover Baldwin-Ehrer-Hill, Inc		
	* Thermoglas Philip Carey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armaglas PF Pipe Insu Armstrong Cork Co		
	* Micro-Lot® Johns-Manville Sales Corp		
	* PPG Glass Fiber Pitts Plate Glass Co		

513



513

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OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev April 1960			
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-Ehrer-Hill, Inc	*Mono-Kover Baldwin-Ehrer-Hill, Inc	
	*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	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	

DUP 0990952



514

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70 20 E 5

SN 100 M		OCTOBER 1954	
Page 8		Rev April 1960	
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" 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 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.			
515	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	Universal Jacket Owens-Corning Corp
	*Vene-Kover Baldwin-Ehrst-Hill, Inc	*Vene-Kover Baldwin-Ehrst-Hill, Inc	
	*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	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	

96

DUP 0990953

090539

97

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

SN 100 M

Rev April 1960

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" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		Length - 36" Width - 6" or 12" 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.			
516	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		Fiberglas Block Insulation Owens-Corning Corp
	Armatemp Spun Wool Duct - Plain Armstrong Cork Co		Armaglas Block Insulation Armstrong Cork Co
	Spintex No. 414 or 415 Johns-Manville Sales Corp		
	Spunduct Baldwin-Ehret-Hill, Inc		

DUP 0990954

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SN 100 M

MATERIAL SPECIFICATION - SERIES 100

OCTOBER 1954

Page 10

Rev April 1960

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 3/4" to 2" thickness		24" x 48" boards 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.			
517	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
	Spinsax No. 414VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehrst-Hill, Inc
	Spunduct Baldwin-Ehrst-Hill, Inc		

98

DUP 0990955

090541

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SN 100 M
Rev April 1960				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.				
518		PV Supersemp Eagle-Picher	Rock Cork Johns-Manville Sales Corp	
		Mono-Block Baldwin-Ehrer-Hill, Inc	Mineral Wool Board Armstrong Cork Co	
		Armasemp Armstrong Cork Co	Koldboard Baldwin-Ehrer-Hill, Inc	
		W F Block M. H. Derrick Co		

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 12		Rev Dec 1960		
Code	116	117		
Material	Flexible foamed plastic	Urethane Foam Resilient		
Material Description	Flexible aerated neoprene with a closed cellular structure. Pipe and tubing only.	See Codes 117.1 through 117.5.		
Filler				
Blender				
Temperature Range	32°F to 200°F			
K Factor	0.28 at 75°F			
Density	8 lb per cu ft			
Compressive Strength				
Manufacturing Process	Medium molded			
Resistance to Breakage in Handling	Nonbreakable			
Dimensions				
Other Qualifications	Chemically inert and nontoxic Self-extinguishing			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
519	Press-O-Cal Presstite Div American Marietta Corp			
	Vasco-Cal Virginia Smelting Co			

DUP 0990957

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117

OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev. Oct. 1960			
SN 100 M			
Page 13			
Code	117.1	117.3	
Material	Urethane Foam Resilient	Urethane Foam Resilient	
Material Description	Preformed resilient urethane snap-on foam pipe insulation manufactured with Du Pont "Mylene" and polyester or polyether resins	Preformed resilient urethane snap-on foam pipe insulation manufactured with Du Pont "Mylene" and polyester or polyether resins and kraft aluminum factory-applied vapor-barrier jacket incorporating a fire-stuff adhesive	
Filler			
Binder			
Recommended Service Temperature Range	45°F to 150°F	45°F to 150°F	
K Factor	0.27 max at 75°F	0.27 max at 75°F	
Density	2 to 4 lb per cu ft	2 to 4 lb per cu ft	
Compressive Strength	Min 0.25 psi at 25% deformation measured parallel to the direction in which the foam rose during manufacture		
Manufacturing Process	Molded and stabilized dimensionally	Molded and stabilized dimensionally	
Resistance to Breakage in Handling	Excellent	Excellent	
Dimensions	± 1/16" - 0" on insulation ID, all others to be accurate to ± 1/16"		
Other Qualifications	Uniform cell structure. No voids with any dimension exceeding 3/8"	Uniform cell structure. No voids with any dimension exceeding 3/8"	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
520	Flexfoam Delaware Ins Co	Flexfoam Delaware Ins Co	
	Therma Am. Cellular Products, Inc		

DUP 0990958

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 14				Rev Oct 1960	
Code	117.6	118			
Material	Urethane Foam Resilient	Urethane Foam Rigid			
Material Description	Preformed resilient urethane foam pipe and fitting insulation manufactured from polyether resin and Du Pont "Hylone" and factory-applied jacket consisting of glass scrim bonded between 1 mil aluminum foil and 1 mil "Taslar"	Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with Du Pont "Hylone" and polyester or polyether resins			
Filler					
Binder					
Recommended Service Temperature Range	45°F to 150°F	-100°F to +150°F			
K Factor	0.27 max at 75°F	0.17 max at 75°F			
Density	2 to 4 lb per cu ft	1 1/2 to 4 lb per cu ft			
Compressive Strength	Min 20 lb per sq in. or 10% deformation, measured parallel to the direction in which the foam rose during manufacture				
Manufacturing Process	Molded and stabilized dimensionally	Molded or cut from molded billet			
Resistance to Breakage in Handling	Excellent	Excellent			
Dimensions	+1/16" - 0" on insulation ID, all others to be accurate to ± 1/16"	+1/16" - 0" on insulation ID, all other dimensions to be ± 1/16" including straightness and squareness			
Other Qualifications	Uniform cell structure. No voids with any dimension exceeding 1/8"	Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/8". Heat aging tests max 3.5% volume change; humid aging test max 3% volume change and max 20% compressive strength change in accordance with MIL-P-21929 (SHIPS). Nonburning in accordance with ASTM D 1692. Water absorption max 2% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.					
521	Flexifoam	U-200			
	Delaware Ins Co	Union Asbestos & Rubber Co			
		Cem Foam			
		Seldwin-Ehren-Mill Co			
					

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87

MATERIALS		THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION	
MATERIAL SPECIFICATION SERIES 100 PREFORMED BLOCK AND PIPE		ISSUED OCT 1954	SN 100 M
		REVISED APRIL 1960	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 - 0.3	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.			
*Bonds are supplied at extra cost. Order must state "with-out bonds" if not required. For 11" IPS and larger there is an additional charge for 2-as canvas cover. Material should be specified "without 2-as canvas" to avoid extra charge.	85% Mag Philip Carey Mfg Co Thermalite 85% Baldwin-Ehrst-Hill, Inc 85% Mag. Johns-Manville Sales Corp	Calcilite The Ruberoid Co Keylo Owens-Corning Corp Thermobestos Johns-Manville Sales Corp Keytherm Keesby & Mattison Co	High Temp No. 19 Philip Carey Mfg Co Enduro Hi-Temp. Baldwin-Ehrst-Hill, Inc J/M Superes Johns-Manville Sales Corp High Temp. Keesby & Mattison Co
New Simplified Dimensional System sponsored by ASTM	Featherweights Keesby & Mattison Co 85% Mag Mundet Clark Corp Precision-molded Pabco Ind Ins Div *	Tricalite Mundet Clark Corp Calcemp Pabco Ind Ins Div *** Careysens Philip Carey Mfg Co	
***Fiber Board Paper Products Corp			
† Codes 104 and 106 are acceptable alternatives unless noted on the Project Specifications.			

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522

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 0990960

090546

SN 100 M

OCTOBER 1954

MATERIAL SPECIFICATION - SERIES 100

Page 2

Rev April 1960

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 Block - 500°F - 0.58 max		500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 comp 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. ** Max temp of Kayle 20 is 1800°F			Unibestos Union Asbestos & Rubber Co
	Kayle 20		
	Owens-Corning Corp		

523

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OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev April 1960				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. 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 Excel -6-ply Cavocel-8-ply	Asbestos Sponge Johns-Manville Sales Corp		Preshrunk Asbestocel Johns-Manville Sales Corp	
	Asbestos Sponge Philip Carey Mfg Co		Aircell *	
	Sponge Felt The Rubensid Co		K & M - Aircell	
	Sponge Felt Baldwin-Ehrst-Hill, Inc		Keesbey & Mattison Co	
	Sponge Felt Smith and Kanzler Corp		B-H Aircell	
			Baldwin-Ehrst-Hill, Inc	

DUP 0990962

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 4				Rev Jan 1961
Code	110	111	111.1	
Material	Vegetable cork	Cellular glass	Cellular glass	
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.	Cellular glass foamed and fused into unicellular form. Factory-applied jacket having white kraft paper outer jacket (60 lb per 3000 sq ft) backed by 0.00035" aluminum foil with fire-resistant adhesive.	
Filler				
Binder	Natural resin in cork			
Temperature Range	-200°F to 100°F	-200°F to 100°F (+300°F for dual temp)	+35°F to +300°F	
K Factor	100°F - 0.29 max	100°F - 0.43 max	100°F - 0.43 max	
Density	9 - 11 lb per cu ft	10 - 11 lb per cu ft	9 lb per cu ft	
Compressive Strength	15 lb per sq in. min	100 lb per sq in. min	100 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.				
525	Cork Armstrong Cork Co	Foamglas Pittsburgh Corning Corp	Foamglas Stay-Dry Pittsburgh Corning Corp	
	Cork Mundet Cork Co			

100

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DUP 0990963

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93

OCTOBER 1954

Rev April 1960

MATERIAL SPECIFICATION - SERIES 100

SM 100 M

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.			
527	*Ultrafine Snap-on Gustin-Bacon Mfg Co		
	*Mono-Kover Baldwin-Ehrst-Hill, Inc		
	*Thermoglas Philip Cary Mfg Co		
	**Fiberglas Owens-Corning Corp		
	**Armoglas PF Pipe Insu Armstrong Cork Co		
	*Micro-Lok Johns-Manville Sales Corp		

DUP 0990965

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SM 100 M		OCTOBER 1954	
Page 6		MATERIAL SPECIFICATION - SERIES 100	
		Rev April 1960	
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-Ehrer-Mill, Inc		
	* Thermaglas Philip Carey Mfg Co		
	** Fiberglas Owens-Corning Corp		
	** Armaglas PF Pipe Insu Armstrong Cork Co		
	* Micro-Lot* Johns-Manville Sales Corp		
	* PPG Glass Fiber Pitts Plate Glass Co		
528			

23

REV. 10-54
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OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev. April 1960			
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" 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.			
529	*Ultrafine Snap-on Gustin-Bacon Mfg Co	*Ultrafine Snap-on Gustin-Bacon Mfg Co	
	*Vero-Kover Baldwin-Ehret-Mill, Inc	*Vero-Kover Baldwin-Ehret-Mill, Inc	
	*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	
	*Micro-Lok Johns-Manville Sales Corp	*Micro-Lok Johns-Manville Sales Corp	
	*PPG Glass Fiber Pitts Plate Glass Co	*PPG Glass Fiber Pitts Plate Glass Co	

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SM 100 M MATERIAL SPECIFICATION - SERIES 100			
Page 8		OCTOBER 1954	
Code		112.21	112.22
Material		112.21	112.22
Material Description		Textile type fine glass fiber bonded pipe insulation with white factory-applied aluminum laminate vapor-barrier finish per Code 723.1.	Textile type fine glass fiber bonded pipe insulation with factory-applied 60 lb per 3000 sq ft white bleached kraft paper, laminated to 0.0007" aluminum foil with fire-retardant adhesive (moisture-vapor transmission rate shall not exceed 0.015 perms - wet cup test) and reinforced with glass fiber mesh 4" X 8".
Filler			
Binder		Phenol-formaldehyde or Di-Cy	Phenol-formaldehyde
Temperature Range		40°F to 200°F	100°F to 250°F
K Factor		100°F - 0.25	100°F - 0.25
Density		3" and 6" lb per cu ft	3 lb per cu ft min
Compressive Strength			Very low
Manufacturing Process		Machine molded	Machine molded
Resistance to Breakage in Handling		Very good	Very good
Dimensions			1/2 and 3/4 thick 3 ft sections
Other Qualifications		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.			
530		* Ultrafine Snap-on Gustin-Bacon Mfg Co	Flame-Retardant Jacket (FRI) Owens-Corning Corp
		* Mono-Kover Baldwin-Ehren-Mill, Inc	
		* Thermaglas Philip Carey Mfg Co	
		** Fiberglass Owens-Corning Corp	
		** Armaglas PF Pipe Insu Armstrong Cork Co	
		* Micro-Lok Johns-Manville Sales Corp	
		* PPG Glass Fiber Pittsburgh Plate Glass Co	

102

REV. SUP. 1967

SUP. BY

DUP 090968

CONTINUED

090554

97

OCTOBER 1954

Rev April 1960

MATERIAL SPECIFICATION - SERIES 100

SN 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 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" Thickness PF615 (6-lb density) 1/2" through 3". PF617 (9-lb density), 1/2" through 2 1/4".		Length - 36" Width - 6" or 12" 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.			
531	Fiberglas PF615 or 617 Insulation Owens-Corning Corp		Fiberglas Block Insulation Owens-Corning Corp
	Armasemp Spun Wool Duct - Plain Armstrong Cork Co		Armoglas Block Insulation Armstrong Cork Co
	Spintex No. 414 or 415 Johns-Manville Sales Corp		
	Spunduct Baldwin-Ehrst-Hill, Inc		

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SN 100 M

OCTOBER 1954

98

MATERIAL SPECIFICATION - SERIES 100

Page 10

Rev April 1960

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 3/4" to 2" thickness		24" x 48" boards 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.			
532	Fiberglas Vapor Seal Duct Insu Owens-Corning Corp		Fiberglas Coated Duct Insu Owens-Corning Corp
	Armstrong Spun Wool Duct - Faced VB Armstrong Cork Co		Armstrong Spun Wool Duct - Coated Armstrong Cork Co
	Spintex No. 414 VS Johns-Manville Sales Corp		Coated Duct Insulation Baldwin-Ehret-Hill, Inc
	Spanduct Baldwin-Ehret-Hill, Inc		

DUP 0990970

090556

OCTOBER 1954		MATERIAL SPECIFICATION - SERIES 100		SM 100 M
Rev April 1960				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.				
533		PV Supersemp Eagle-Picher	Rock Cork Johns-Manville Sales Corp	
		Mono-Block Baldwin-Ehret-Hill, Inc	Mineral Wool Board Armstrong Cork Co	
		Armasemp Armstrong Cork Co	Koldboard Baldwin-Ehret-Hill, Inc	
		M W Block M. H. Detrick Co		

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954
Page 12				Rev Dec 1960
Code	116	117		
Material	Flexible foamed plastic	Urethane Foam Resilient		
Material Description	Flexible aerated neoprene with a closed cellular structure. Pipe and tubing only.	See Codes 117.1 through 117.5.		
Filler				
Bladder				
Temperature Range	32°F to 200°F			
K Factor	0.28 at 75°F			
Density	8 lb per cu ft			
Compressive Strength				
Manufacturing Process	Medium molded			
Resistance to Breakage in Handling	Nonbreakable			
Dimensions				
Other Qualifications	Chemically inert and nontoxic Self-extinguishing			
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.				
534	Press-O-Cal Pressite Div American Marietta Corp			
	Vasco-Cal Virginia Smelting Co			

DUP 0990972

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117

OCTOBER 1954			
MATERIAL SPECIFICATION - SERIES 100			
Rev Oct 1960			
SN 100 M			
Page 13			
Code	117.1	117.3	
Material	Urethane Foam Resilient	Urethane Foam Resilient	
Material Description	Preformed resilient urethane snap-on foam pipe insulation manufactured with Du Pont "Hylene" and polyester or polyether resins	Preformed resilient urethane snap-on foam pipe insulation manufactured with Du Pont "Hylene" and polyester or polyether resins and kraft aluminum factory-applied vapor-barrier jacket incorporating a fire-shutoff adhesive	
Filler			
Binder			
Recommended Service Temperature Range	45°F to 150°F	45°F to 150°F	
K Factor	0.27 max at 75°F	0.27 max at 75°F	
Density	2 to 4 lb per cu ft	2 to 4 lb per cu ft	
Compressive Strength	Min 0.25 psi at 25% deformation measured parallel to the direction in which the foam rose during manufacture		
Manufacturing Process	Molded and stabilized dimensionally	Molded and stabilized dimensionally	
Resistance to Breakage in Handling	Excellent	Excellent	
Dimensions	± 1/16" - 0" on insulation ID, all others to be accurate to ± 1/16"		
Other Qualifications	Uniform cell structure. No voids with any dimension exceeding 3/8	Uniform cell structure. No voids with any dimension exceeding 3/8	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.			
535	Flexfoam Delaware Ins Co	Flexfoam Delaware Ins Co	
	Thermal Am. Cellular Products, Inc		

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SN 100 M		MATERIAL SPECIFICATION - SERIES 100		OCTOBER 1954	
Page 14		Rev Oct 1960			
Code		117.6		118	
Material		Urethane Foam Resilient		Urethane Foam Rigid	
Material Description		Preformed resilient urethane foam pipe and fitting insulation manufactured from polyether resin and Du Pont "Hylone" and factory-applied jacket consisting of glass scrim bonded between 1 mil aluminum foil and 1 mil "Toslar"		Preformed rigid urethane foam block, pipe, and fitting insulation manufactured with Du Pont "Hylone" and polyester or polyether resins	
Filler					
Binder					
Recommended Service Temperature Range		45°F to 150°F		-100°F to +150°F	
K Factor		0.27 max at 75°F		0.17 max at 75°F	
Density		2 to 4 lb per cu ft		1 1/2 to 4 lb per cu ft	
Compressive Strength		Min 20 lb per sq in. at 10% deformation, measured parallel to the direction in which the foam rose during manufacture			
Manufacturing Process		Molded and stabilized dimensionally		Molded or cut from molded billet	
Resistance to Breakage in Handling		Excellent		Excellent	
Dimensions		±1/16" - 0" on insulation ID, all others to be accurate to ±1/16"		±1/16" - 0" on insulation ID, all other dimensions to be ±1/16" including straightness and squareness	
Other Qualifications		Uniform cell structure. No voids with any dimension exceeding 1/8"		Uniform cell structure with max 10% open cells. No voids having any dimensions exceeding 1/4". Moist aging tests max 3.5% volume change; humid aging test max 5% volume change and max 20% compressive strength change in accordance with MIL-P-21929 (SHIPS). Nonburning in accordance with ASTM D 1692. Water absorption max 2% by volume into a 2" x 2" x 1" skin-free piece immersed in water just under the surface for 5 days	
The following materials have proven satisfactory in field tests and proof has been furnished by the manufacturers that their product meets the above specifications.					
		Flexifoam Delaware Ins Co		U-200 Union Asbestos & Rubber Co	
				Gem Foam Beldurn-Ehren-Hill Co	

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DUP 0909074

REFERENCES

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

THERMAL INSULATION STANDARD ENGINEERING SPECIFICATION

ISSUED OCT 1954
REVISED APRIL 1960

SN 100 H
Page 1 of 14

Code	101*	102*	103
Material	85% Magnesia	Calcium silicate	Diatomaceous earth
Material Description	Hydrated basic magnesium carbonate 90% by weight minimum	Stable, cellular, calcined fire clay base	Diatomaceous earth, asbestos fiber, with perlite 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 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.

*Sensors are supplied at extra cost. Order must state "without bands" if not required.	85% Mag Philip Carey Mfg Co	Calcelite The Ruberoid Co	High Temp No. 19 Philip Carey Mfg Co
For 11" IPS and larger there is an additional charge for 2-oz curves cover. Material should be specified "without 2-oz curves" to avoid extra charge.	Thermalite 85X Baldwin-Ehren-Mill, Inc	Keylo Owens-Corning Corp	Enduro Hi Temp. Baldwin-Ehren-Mill, Inc
	85% Mag. Johns-Manville Sales Corp	Thermabestos Johns-Manville Sales Corp	1/4 Supers Johns-Manville Sales Corp
		Keytherm Keesby & Morrison Co	High Temp. Keesby & Morrison Co
**New Simplified Dimensional System sponsored by ASTM	Femhermights Keesby & Morrison Co	Incelite Mundt Carb Corp	
***Fiber Board Paper Products Corp	85% Mag Mundt Carb Corp	Callamp Pebes Ind Ins Div ***	
† Codes 104 and 106 are assemblable alternatives unless noted on the Project Specifications.	Precision-molded Pebes Ind Ins Div ***	Caroytoms Philip Carey Mfg Co	

DUP 09905

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.

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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 - 0.54 max Block - 500°F - 0.58 max	500°F - 0.54 max
Density	Pipe covering - 15 lb per cu ft 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 cased 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 mandrel 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.		Unibestos Union Asbestos & Rubber Co
** Max temp of Kayla 20 is 1800°F	Kayla 20 Owens-Corning Corp	

