

PLAINTIFF'S  
EXHIBIT  
K-1471a

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A.I.A. FILE NO. 37-D

**Johns-Manville**



HIGH TEMPERATURE  
PLUMBING, HEATING & AIR CONDITIONING  
REFRIGERATION  
INSULATING FIRE BRICK  
REFRACTORY PRODUCTS  
FINISHES & WEATHERPROOFING MATERIALS  
ASBESTOS PAPER & MILLBOARD

A.I.A. FILE NO. 37-D



DEFENDANT'S  
EXHIBIT

OF-40A

P-155  
01-9

Since 1858, Johns-Manville has been adding to its knowledge of how to manufacture better insulating materials to meet the increasingly exacting demands of industry. During this hundred year period it has developed and improved methods and machines for manufacturing insulations and accessory materials for every industrial and commercial requirement. Today, Johns-Manville operates thirty-three manufacturing plants and three mines.

One of which the cost of insulating is illustrated in the lower right corner. This strategically located plant provides the best possible service in all sections of the country. Modern methods of mass production and quality control assure product uniformity and reliability for your insulation. All of the plants flow the Johns-Manville quality of insulating materials that is so much to the efficient and economical operation of American industry.

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# THERMOBESTOS

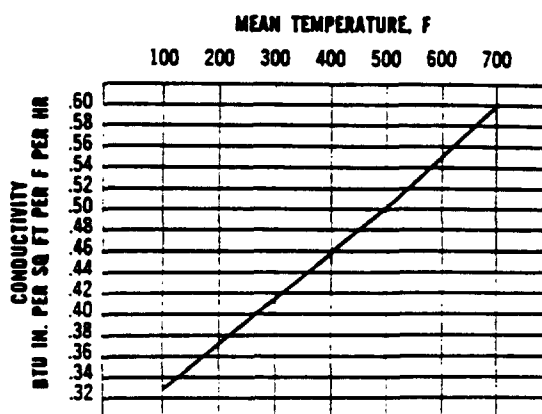
## Specification Data

TEMPERATURE

### PHYSICAL PROPERTIES

|                                                          |                                          |
|----------------------------------------------------------|------------------------------------------|
| Density (dry)                                            | 11 lbs per cu ft                         |
| Transverse Strength<br>(modulus of rupture)              | 95 psi                                   |
| Compressive Strength<br>(Based on 2" thickness of block) | 185 psi to produce 5% compression        |
| Linear Shrinkage                                         | 1.5% after 24-hr soaking period at 1200F |
| Maximum Service Temperature                              | 1200F                                    |

\*The figures given in this table are average values obtained in accordance with accepted test methods.



#### Pipe Insulation:

MIL-I-2781

Grade I, class b, to 500F

Grade II, class d, to 750F

Grade III, class e, type I and II, to 1050F

FEDERAL HH-I-523 Class 2, to 1200F

#### Block Insulation:

MIL-I-2819

Class a, to 500F

Class b, to 1000F

FEDERAL HH-I-523 Class I, to 1200F

#### Pipe Insulation:

C345-54T, to 1200F

#### Block Insulation:

C344-54T, to 1200F



+ 3000F  
**INSULATION**

type: Pipe  
temp limit: 1200F

## J-M METAL-ON® pipe insulation

■ **DESCRIPTION:** J-M Metal-On pipe insulation consists of high temperature Thermobestos pipe insulation pre-jacketed at the factory with top-quality aluminum. Furnished as an integral package (including a built-in isolation felt), a section of Metal-On snaps on the pipe and locks tightly in place to seal out weather and protect insulation indefinitely. Joints are sealed with aluminum "snap straps" fastened with conventional metal strapping bands. No sheet metal screws are used. Aluminum alloy jacket (containing magnesium) is especially selected to give superior corrosion resistance and strength.

■ **AVAILABLE FORMS:** Furnished in pipe insulation form only. Available in 36" sections in a complete range of sizes up to 24" pipe size by 3" thickness.

■ **USES:** Particularly recommended for use in the power generation, petroleum, chemical and allied industries, especially on outdoor installations, at operating temperatures to 1200F.

### ■ ADVANTAGES

#### Installation Savings

Both insulation and jacket are furnished in a single package, installed in a single operation.

#### Excellent Weather Protection

Keeps insulation dry during installation, thus avoiding electrolytic corrosion of aluminum through direct contact with wet insulation common where jacket is installed as a separate operation.

#### Proper Jacket Thickness

Jacket thickness designed to provide, at lowest cost, outstanding appearance, stiffness, workability, and resistance to abuse.

#### Integral Isolation Felt

A built-in, properly designed barrier between jacketing and insulation.

#### Easy to Remove

Rapid, easy removability for repairs and maintenance.

For Specification Data, including physical and thermal properties, recommended thicknesses, compliance with specifications, etc., see Thermobestos pipe insulation.

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# SUPEREX

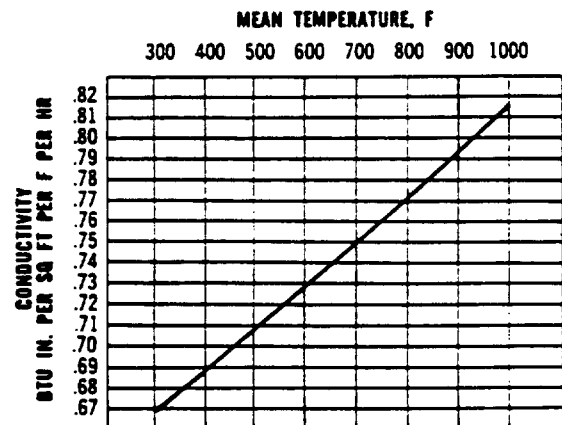
## Specification Data

### PHYSICAL PROPERTIES

|                                                                            |                                    |
|----------------------------------------------------------------------------|------------------------------------|
| Density (dry)                                                              | 24 lbs per cu ft                   |
| Transverse Strength<br>(modulus of rupture)                                | 100 psi                            |
| Compressive Strength                                                       | 85 psi to produce 1/4" compression |
| Linear Shrinkage<br>(after 24 hr soaking heat at<br>indicated temperature) | 2.7% at 1900F                      |
| Maximum Service Temperature                                                | 1900F                              |

\*The figures given in this table are average values obtained in accordance with accepted test methods.

### THERMAL CONDUCTIVITY



### COMPLIANCE WITH GOVERNMENT SPECS

MIL-I-2819, Class C

### STANDARD SIZES AND THICKNESSES

| Length, inches | Width, inches                            | Thickness, inches              |
|----------------|------------------------------------------|--------------------------------|
| 18 and 36      | 3 & 6 flat or curved<br>9 & 12 flat only | 1 through 4<br>1 1/2 through 4 |

NOTE: For special sizes and curved blocks consult your nearest Johns-Manville office.

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# SUPEREX-M

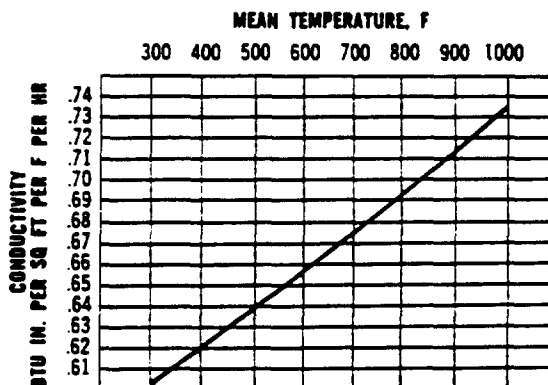
## Specification Data

### PHYSICAL PROPERTIES

|                                                                            |                                    |
|----------------------------------------------------------------------------|------------------------------------|
| Density (dry)                                                              | 21 lbs per cu ft                   |
| Transverse Strength<br>(modulus of rupture)                                | 90 psi                             |
| Compressive Strength                                                       | 70 psi to produce 1/8" compression |
| Linear Shrinkage<br>(after 24 hr soaking heat<br>at indicated temperature) | 2.7% at 1900F                      |
| Maximum Service Temperature                                                | 1600F                              |

\*The figures given in this table are average values obtained in accordance with accepted test methods.

### THERMAL CONDUCTIVITY



### COMPLIANCE WITH GOVERNMENT SPECS

Pipe Insulation:  
MIL-I-2781B  
Grade III, Class E, Type 2

Block Insulation:  
MIL-I-2819  
Class B and C

### STANDARD SIZES AND THICKNESSES

| Pipe Insulation:              |                                          | Thickness, inches<br>(to fit standard pipe sizes)               |
|-------------------------------|------------------------------------------|-----------------------------------------------------------------|
| Length                        |                                          |                                                                 |
| 3-ft sections<br>and segments |                                          | Nominal 1 (through 6" pipe<br>size only), 1 1/2, 2, 2 1/2 and 3 |
| Block Insulation:             |                                          |                                                                 |
| Length, inches                | Width, inches                            | Thickness, inches                                               |
| 18 and 36                     | 3 & 6 flat or curved<br>9 & 12 flat only | 1 through 4<br>1 1/2 through 4                                  |

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## ■ ADVANTAGES

### Easily Handled

Higher strength and body improves "handleability"  
... fibers will not dislodge around edges.

### Uniform Thickness

More uniform fiber orientation results in uniform thickness and eliminates thin spots.

### Light Weight

.67 lbs per sq ft per 1 inch thickness.

### Square Edges

Makes possible firmer and squarer blanket edges, both as furnished and as cut on the job.

### Factory Fabricated

Each blanket made to conform to rigid product specs.

## BANROC BLANKETS Specification Data

### COMPLIANCE WITH GOVERNMENT SPECS

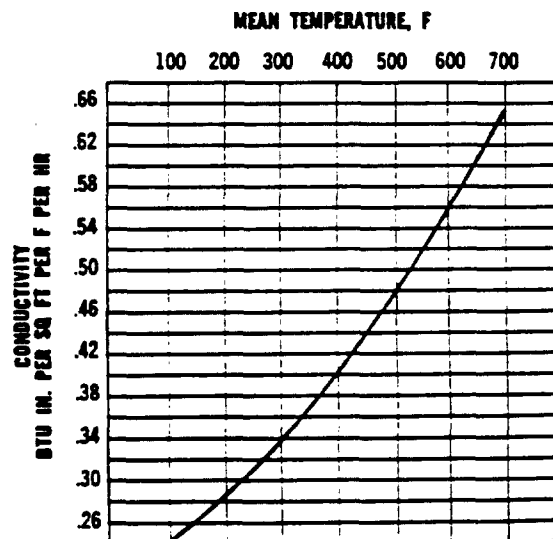
HH-1-563, Amendment 1—Type I, Class A & B

### STANDARD SIZES\* AND THICKNESSES

| Blanket Size, inches | Thickness, inches    |
|----------------------|----------------------|
| 24 x 48              | 1, 1¼, 1½, 1¾, 2,    |
| 24 x 96              | 2½, 3, 3½, 4, 4½, 5, |
|                      | 5½, 6                |

\*All thicknesses up to and including 3" consist of single layer of felt.  
Greater thicknesses consist of two layers of felt.

### THERMAL CONDUCTIVITY



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# MARINITE

## Specification Data

### PHYSICAL PROPERTIES\*

|                                                                                                                                         | Marinite-23                                                                           | Marinite-38                                                   | Marinite-85                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| Density (Dry), lbs/cu ft                                                                                                                | 23                                                                                    | 36                                                            | 65                                                            |
| Transverse Strength (Dry), psi (Modulus of Rupture)                                                                                     | 550                                                                                   | 900                                                           | 1500                                                          |
| After 24-hr soaking heat at indicated temperature                                                                                       | 450 (900F)                                                                            | 900 (900F)                                                    | 1500 (800F)                                                   |
| Modulus of Elasticity (Dry), psi (From Transverse Test)                                                                                 | $0.20 \times 10^4$                                                                    | $0.36 \times 10^4$                                            | $0.65 \times 10^4$                                            |
| Consolidation (Normal), in./in.                                                                                                         | Load, psi $\left\{ \begin{array}{l} 500 \\ 4000 \\ 8000 \\ 12000 \end{array} \right.$ | 0.02                                                          | 0.01                                                          |
|                                                                                                                                         |                                                                                       | 0.62                                                          | 0.18                                                          |
|                                                                                                                                         |                                                                                       | 0.68                                                          | 0.31                                                          |
|                                                                                                                                         |                                                                                       | 0.74                                                          | 0.39                                                          |
| Compressive Strength (Normal), psi                                                                                                      | 14000                                                                                 | 7000**                                                        | 16000                                                         |
| Screw Holding Strength (Normal), lb/screw<br>(Withdrawal load for Type A, No. 6-12 Sheet-Metal Screws)                                  |                                                                                       |                                                               |                                                               |
| 1/2" penetration                                                                                                                        | 35                                                                                    | 80                                                            | 180                                                           |
| 3/8" penetration                                                                                                                        | 130                                                                                   | 240                                                           | 460                                                           |
| Dimensional Change Due to Moisture, in./in.                                                                                             |                                                                                       |                                                               |                                                               |
| Shrinkage—Normal to dry                                                                                                                 | 0.0008                                                                                | 0.0011                                                        | 0.0007                                                        |
| Expansion—Normal to 90% RH                                                                                                              | 0.0001                                                                                | 0.0001                                                        | 0.0001                                                        |
| Expansion—Dry to saturated                                                                                                              | 0.0010                                                                                | 0.0013                                                        | 0.0009                                                        |
| Thermal Expansion, in./in./F<br>(Avg over temperature range indicated.<br>Detailed information for special cases furnished on request.) | $2.3 \times 10^{-4}$<br>(up to 200F;<br>shrinkage thereafter)                         | $1.3 \times 10^{-4}$<br>(up to 250F;<br>shrinkage thereafter) | $2.9 \times 10^{-4}$<br>(up to 250F;<br>shrinkage thereafter) |
| Maximum Service Temperature, F<br>(For Continuous Service)                                                                              | 900                                                                                   | 900                                                           | 800                                                           |
| Fire Hazard Classification<br>(Listed under Underwriters' Laboratories,<br>Inc. Label Service Guide, No. 40 U8.13)                      | Flame Spread 0, Smoke Developed 0,<br>and Fuel Contributed Negligible                 |                                                               |                                                               |

\*The figures given in the above table are average values (unless otherwise specified) obtained in accordance with accepted test methods. Strength figures must be modified by applying adequate factors of safety to arrive at working values. "Dry" refers to oven-dried samples; "Normal," to normal conditions of 75F and 50% R.H. \*\*For 3 layers of 1" thick material. One inch thickness alone shows no clearly defined failure up to 13,500 psi.

### DIMENSIONAL TOLERANCES

| Material    | Length & Width,<br>inches | Thickness,<br>inches | Squareness, max.<br>dev. per linear<br>yd, inches |
|-------------|---------------------------|----------------------|---------------------------------------------------|
| Marinite-23 | $\pm 1/2$                 | $\pm 1/2$            | $\pm 1/2$                                         |
| Marinite-38 | $\pm 1/2$                 | $\pm 1/2$            | $\pm 1/2$                                         |
| Marinite-85 | $\pm 1/2$                 | $\pm 1/2$            | $\pm 1/2$                                         |

### THERMAL CONDUCTIVITY

|             | MEAN TEMPERATURE, F |      |      |      |      |      |
|-------------|---------------------|------|------|------|------|------|
|             | 100                 | 200  | 300  | 400  | 500  | 600  |
| Marinite-23 | 0.55                | 0.57 | 0.58 | 0.60 | 0.61 | 0.63 |
| Marinite-38 | 0.76                | 0.77 | 0.78 | 0.79 | 0.80 | 0.81 |
| Marinite-85 | 1.50                | 1.56 | 1.62 | 1.68 | 1.74 | 1.80 |

### STANDARD SIZES AND THICKNESSES

| Material    | Thicknesses,<br>inches | Sheet Sizes, feet |           |     |      |
|-------------|------------------------|-------------------|-----------|-----|------|
|             |                        | 3x8               | 3 1/2 x 8 | 4x8 | 4x10 |
| Marinite-23 | 1                      | ✓                 | ✓         | ✓   | ✓    |
|             | 1 1/2                  | ✓                 | ✓         | ✓   | ✓    |
|             | 2                      | ✓                 | ✓         | ✓   | ✓    |
| Marinite-38 | 1/2, 3/4, 1            | ✓                 | ✓         | ✓   | ✓    |
|             | 1 1/2, 2               | ✓                 | ✓         | ✓   | ✓    |
| Marinite-85 | 3/4, 1                 | ✓                 | ✓         | ✓   | ✓    |
|             | 1 1/2, 2               | ✓                 | ✓         | ✓   | ✓    |

\*Subject to 8 to 10 weeks delivery.

CONDUCTIVITY: BTU IN. PER SQ FT PER F PER HR

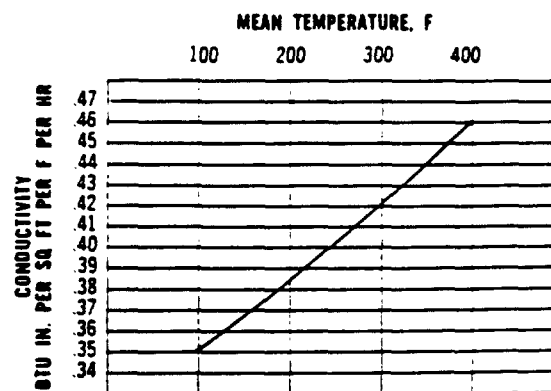
# 85% MAGNESIA

## Specification Data

### PHYSICAL PROPERTIES

|                                             |                                                                             |
|---------------------------------------------|-----------------------------------------------------------------------------|
| Density (dry)                               | 11 lbs per cu ft                                                            |
| Transverse Strength<br>(modulus of rupture) | 50 psi                                                                      |
| Compressive Strength                        | 70 psi to produce 5%<br>compression<br>85 psi to produce 10%<br>compression |
| Linear Shrinkage                            | 0.4% after 24-hr soaking<br>period at 600F                                  |
| Maximum Service Temperature                 | 600F                                                                        |

\*The figures given in this table are average values obtained in accordance with accepted test methods.



### COMPLIANCE WITH GOVERNMENT SPEC

Pipe Insulation:  
MIL-I-2781  
Grade I, class b, to 500F

Block Insulation:  
MIL-I-2819  
Class a, to 500F

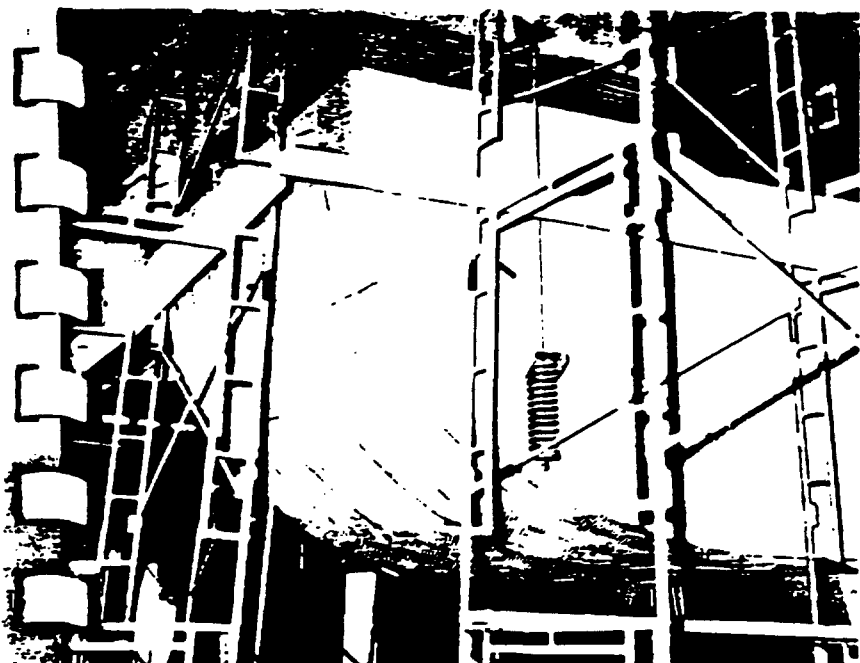
### COMPLIANCE WITH ASTM STANDARDS

Pipe Insulation:  
C320-55, to 600F

Block Insulation:  
C319-55, to 600F

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+ 3000F  
**INSULATION**

type: Block  
temp limit: 1700F

## J-M H. T. BANROC® block insulation

■ **DESCRIPTION:** H.T. Banroc block insulation is a structurally strong and thermally effective insulating material made from felted inorganic fibers bonded with a special heat-resistant binder.

■ **AVAILABLE FORMS:** Furnished in block form only in thicknesses from 1" to 4"; lengths up to 36"; widths to 18".

■ **USES:** For insulating furnaces, boilers, heated vessels and tanks.

### ■ ADVANTAGES

#### Easy Application

Mineral wool composition makes possible impaling of insulation directly on studs or clips.

#### Large Sheet Size

Large size sheets, 18" x 36", cut installation costs.

#### Fireproof

Made from mineral fibers which will not burn.

#### Low Conductivity

H.T. Banroc has a *k* factor of .70 at 800F.

### PHYSICAL PROPERTIES\*

|                                                   |                          |
|---------------------------------------------------|--------------------------|
| Density (dry)                                     | 18 lbs per cu ft         |
| Transverse Strength<br>(modulus of rupture)       | 50 psi                   |
| Linear Shrinkage<br>(average of all 3 dimensions) | 1200F 1700F<br>0.5% 3.0% |

\*The figures given in this table are average values obtained in accordance with accepted test methods.

### STANDARD SIZES AND THICKNESSES

| Length, inches | Width, inches | Thickness, inches          |
|----------------|---------------|----------------------------|
| 18 and 36      | 6, 12 and 18  | 1 to 4 (½ inch increments) |

### THERMAL CONDUCTIVITY

| CONDUCTIVITY<br>BTU IN. PER SQ FT PER F PER HR | MEAN TEMPERATURE, F |     |     |     |
|------------------------------------------------|---------------------|-----|-----|-----|
|                                                | 200                 | 400 | 600 | 800 |
|                                                | .35                 | .45 | .56 | .70 |

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# MICRO-LOK

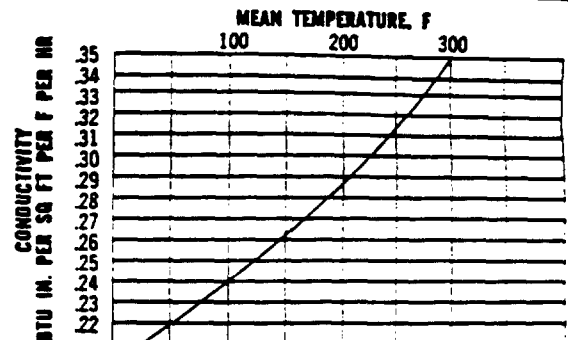
## Specification Data

### PHYSICAL PROPERTIES

|                                                  |                                             |
|--------------------------------------------------|---------------------------------------------|
| Density, nominal                                 | 3.50 lbs per cu ft                          |
| Moisture Adsorption                              | less than 0.2% by vol                       |
| Alkalinity                                       | less than 2% expressed as Na <sub>2</sub> O |
| Corrosivity<br>(with steel, copper,<br>aluminum) | does not cause or accelerate                |
| Thermal Diffusivity<br>(at 150F mean temp)       | 0.032 sq ft per hr                          |

\*The figures given in this table are average values obtained in accordance with accepted test methods.

### THERMAL CONDUCTIVITY



### JACKETING\* INFORMATION

Canvas—4 oz., 6 oz., and 8 oz., in addition to standard canvas. All weights available on all insulation thicknesses and sizes.

General Purpose—60 lb. white bleached kraft laminated to 0.00035" thick aluminum foil. Vapor transmission rate less than .05 perms. Available for ½" and ¾" thicknesses in all pipe sizes.

#### Vapor Barriers

##### Dual Temperature:

WX: three ply with 60 lb. white bleached kraft; 0.001" aluminum foil; and 55 lb. black asphalt-impregnated kraft. Vapor transmission rate less than .02 perms.

BX: three ply with 55 lb. black asphalt-impregnated kraft; 0.001" aluminum foil; and 55 lb. black asphalt-impregnated kraft. Vapor transmission rate less than .02 perms.

##### Flame Resistant:

40 lb. flame retardant kraft paper laminated to 0.001" thick aluminum foil by a flame retardant adhesive. Vapor transmission rate less than .02 perms. Aluminum surface is exposed.

Weather Resistant—three weights of roofing felt available—35 lb., 45 lb., 55 lb. For 1" thick and over pipe insulation, for all pipe sizes.

All jackets have a minimum 1½" longitudinal lap. Canvas jackets have a 2½" circumferential lap. All other jackets are sealed at the circumferential joint by a 4" wide strip of the same material, included in the carton.

\*Factory applied.

### GUIDE TO SPECIFICATIONS FOR APPLICATION AND FINISHING

| Service & Temperature                                    | Location             | Jacket Material                                     |
|----------------------------------------------------------|----------------------|-----------------------------------------------------|
| Hot Water 200F                                           | Exposed or Concealed | Canvas or Gen. Purpose                              |
|                                                          | Outdoor              | Roofing Felt or .016 Aluminum                       |
| Cold Water 50F                                           | Exposed or Concealed | Gen. Purpose                                        |
|                                                          | Outdoor              | Roofing Felt                                        |
| Chilled Water, Brine, Refrigerants and Special Processes | Exposed or Concealed | WX (White) or BX (Black) Dual Temp.                 |
| Dual Temp 212F to sub-zero (—120F)                       | Outdoor              | Black Dual Temp. plus Roofing Felt or .016 Aluminum |
| Hot Water, Low Pressure Steam 350F                       | Exposed or Concealed | Canvas or Gen. Purpose                              |
|                                                          | Outdoor              | Roofing Felt                                        |

### COMPLIANCE WITH GOVERNMENT SPECS

HH-I-552 Type I, Class A and B  
HH-I-562 Type II, Class 1 and 2

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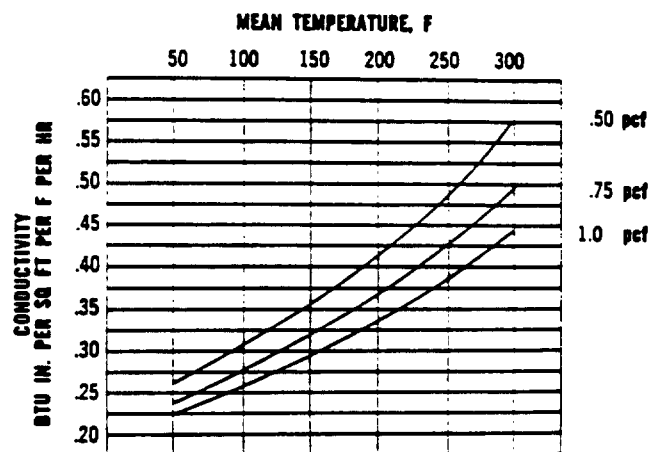
# MICROLITE

## Specification Data

| Density*,<br>lbs per cu ft | Thickness*, inches |              |              |
|----------------------------|--------------------|--------------|--------------|
|                            | 200-ft roll        | 100-ft roll  | 50-ft roll   |
| .50                        | ½                  | 1, 1½, 2, 2½ | 3, 3½, 4     |
| .75                        | ½                  | 1, 1½, 2     | 2½, 3, 3½, 4 |
| 1.0                        | ½                  | 1, 1½        | 2, 2½, 3     |
| 1.5                        | ½                  | 1            | 1½, 2        |
| 2.0                        | —                  | —            | 1, 1½        |
| 2.5                        | —                  | ½, 1**       | —            |
| 3.0                        | —                  | —            | ½, 1**       |

\*All densities and thickness are available in 24, 36, 48, and 72 inch widths. For information about factory-applied vapor barriers, reflective facings, coatings or other densities and thicknesses, call or write the nearest Johns-Manville sales office.

\*\*Cut pieces only.



### COMPLIANCE WITH GOVERNMENT SPECS

HH-I-542, Type I

MIL-I-16022B, class 1, 2, 3, 4 & 5

MIL-I-15365B (Microlite meets this spec in 1, 2 & 3 inch thicknesses and ½, 1, 2 & 3 lb densities only)

Maritime Specification 32-MA-3, class 1 & 2

### SOUND ABSORPTION COEFFICIENTS

| Density,<br>lbs per<br>cu ft | Thickness,<br>inches | Sound Absorption Coefficient<br>at Frequency (cycles per second) of |     |     |      |      |      | NRC* Mounting<br>No. |   |
|------------------------------|----------------------|---------------------------------------------------------------------|-----|-----|------|------|------|----------------------|---|
|                              |                      | 125                                                                 | 250 | 500 | 1000 | 2000 | 4000 |                      |   |
| ½                            | ½                    | .08                                                                 | .14 | .32 | .60  | .73  | .73  | .45                  | 4 |
| ½                            | 1                    | .14                                                                 | .25 | .51 | .80  | .78  | .76  | .60                  | 4 |
| ½                            | 1½                   | .18                                                                 | .44 | .77 | .92  | .81  | .77  | .75                  | 4 |
| 1                            | ½                    | .08                                                                 | .16 | .37 | .68  | .77  | .78  | .50                  | 4 |
| 1                            | 1                    | .12                                                                 | .30 | .68 | .94  | .82  | .80  | .70                  | 4 |

\*Noise Reduction Coefficient — The average of the sound absorption coefficients at frequencies of 250, 500, 1000 and 2000 cycles per second. The NRC is given to the nearest 5%.

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# MICROTEX

## Specification Data

### STANDARD DENSITY & THICKNESSES

| Density,*<br>lbs per cu ft | Thickness,* inches |             |            |            |
|----------------------------|--------------------|-------------|------------|------------|
|                            | 200-ft roll        | 100-ft roll | 75-ft roll | 50-ft roll |
| .50                        | —                  | 1,1½        | 2,2½,3     | —          |
| .75                        | —                  | 1,1½        | 2,2½,3     | —          |
| 1.0                        | —                  | 1,1½        | 2,2½       | 3          |
| 1.5                        | ½                  | 1           | —          | 1½,2       |
| 2.0                        | —                  | ½           | —          | 1,1½       |
| 2.5                        | —                  | ½           | —          | 1          |
| 3.0                        | —                  | ½           | —          | 1          |

### MEAN TEMPERATURE, 75F

| Density,<br>lbs per<br>cu ft | CONDUCTIVITY      |              |
|------------------------------|-------------------|--------------|
|                              | BTU IN. PER SQ FT | PER F PER HR |
| ¾                            |                   | .29          |
| 1                            |                   | .265         |
| 1½                           |                   | .245         |
| 2                            |                   | .23          |
| 2½                           |                   | .226         |
| 3                            |                   | .225         |

\*All densities and thicknesses available in 24, 36, and 48 inch widths. For information about factory-applied coatings, vapor barriers or reflective facings, call or write the nearest Johns-Manville sales office.

### SOUND ABSORPTION COEFFICIENTS

| Density,<br>lbs per<br>cu ft | Thickness,<br>inches | Sound Absorption Coefficient at Frequency<br>(cycles per second) of |     |     |      |      |      | NRC* | Mounting<br>No. |
|------------------------------|----------------------|---------------------------------------------------------------------|-----|-----|------|------|------|------|-----------------|
|                              |                      | 125                                                                 | 250 | 500 | 1000 | 2000 | 4000 |      |                 |
| 1½                           | ½                    | .15                                                                 | .48 | .34 | .50  | .68  | .67  | .50  | 6               |
| 1½                           | 1                    | .22                                                                 | .60 | .54 | .80  | .84  | .79  | .70  | 6               |
| 2                            | ½                    | .15                                                                 | .48 | .36 | .56  | .68  | .67  | .52  | 6               |
| 2                            | 1                    | .24                                                                 | .61 | .57 | .85  | .86  | .81  | .72  | 6               |
| 3                            | ½                    | .17                                                                 | .49 | .39 | .66  | .75  | .74  | .57  | 6               |
| 3                            | 1                    | .27                                                                 | .63 | .62 | .91  | .89  | .83  | .76  | 6               |

\*Noise Reduction Coefficient—The average of the sound absorption coefficients at frequencies of 250, 500, 1000 and 2000 cycles per second. The NRC is given to the nearest 5%.

# SPINTEX

## Specification Data

| Type               | Wt per<br>bd ft. lb | Length,<br>inches | Width,<br>inches | Thickness,<br>inches | Facings        |
|--------------------|---------------------|-------------------|------------------|----------------------|----------------|
| No. 411 (flexible) | 0.21                | 60, 120           | 30               | 1, 1½, 2             | VS, VF, AF     |
| No. 413 (flexible) | 0.35                | 48, 60            | 15, 30*          | 1, 1½, 2, 3          | VS, VF, AF     |
| No. 414 (rigid)    | 0.50                | 48, 60            | 15, 30*          | 1, 1½, 2             | VS, VF, AF, AP |
| No. 415 (rigid)    | 0.67                | 48, 60            | 15, 30*          | 1, 1½, 2             | VS, VF, AF, AP |

\*Spintex No. 413, 414, and 415, when faced, are available in 30" width only.

### SPECIAL FACING CHARACTERISTICS

| Type | Description                                 | Combustible | Water-vapor<br>barrier |
|------|---------------------------------------------|-------------|------------------------|
| VS   | Kraft paper and asphalt*                    | yes         | yes                    |
| VF   | .004" vinyl film                            | **          | yes                    |
| AF   | Laminate .001" aluminum<br>foil-scrim-kraft | **          | yes                    |
| AP   | Plain asbestos paper                        | no          | no                     |

\*No. 413, 414 and 415 only. Sisalkraft paper and asphalt furnished on No. 411.

\*\*Facing will burn but flame goes out when source of heat is removed. Flame is not transmitted along facing.

### COMPLIANCE WITH GOVERNMENT SPECS

Spintex No. 415—HH-I-562, Type I, Class 2\*\*. Spintex No. 414 & 415—HH-I-564, Type II, Class A\*\*. Spintex No. 413, 414 & 415—HH-I-542, Type II\*\*.

\*\*Standard dimensions of Spintex Duct Insulation are not identical with those mentioned in these Federal Specifications.

### • FOR SEALING DUCT • INSULATION JOINTS...

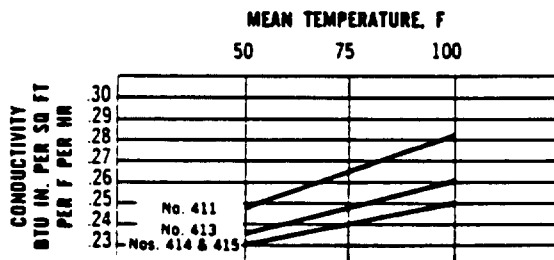
### • J-M DUTCH BRAND • PRESSURE SENSITIVE TAPE

- Johns-Manville recommends J-M Dutch Brand No. 353 Duct Sealing Tape for forming, holding, and sealing air duct insulation. Specially treated water-proof, water-resistant silver cloth backing provides excellent vapor barrier. Adhesive grips non-porous surfaces to make air-tight seam at joints and overlaps.



- Backing: ..... Cloth-colored plastic coating.
- Color: ..... Silver.
- Adhesive Mass: ..... Water insoluble—rubber and resin base.
- Roll Length: ..... 60 yds. (Special lengths on inquiry).
- Widths: ..... All standard widths.
- Core size: ..... 3"
- Packing: ..... Bulk case with each roll separated, center supported.

### THERMAL CONDUCTIVITY

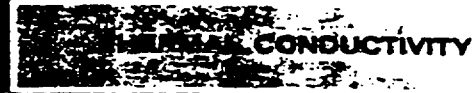


*An Insulation for Every Commercial and Industrial Purpose*



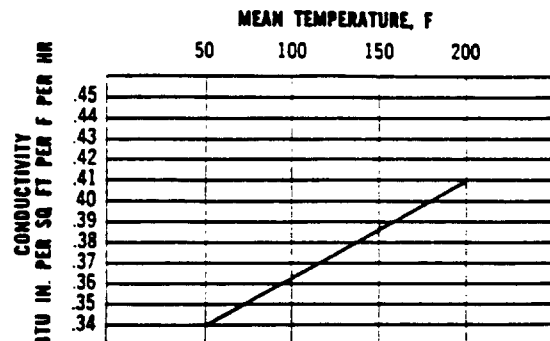
# FIBROCEL

## Specification Data



|                                          |                                               |
|------------------------------------------|-----------------------------------------------|
| Density (dry)                            | 9 lbs per cu ft                               |
| Transverse Strength (modulus of rupture) | 50 psi                                        |
| Linear Shrinkage                         | moist to dry—<br>.05" per 36" length          |
| Temperature Range                        | to 300F                                       |
| Permeance                                | VB: 0.01 perm maximum<br>VS: 0.3 perm maximum |

\*The figures given in this table are average values obtained in accordance with accepted test methods.



### COMPLIANCE WITH GOVERNMENT SPECS

Fibrocel C meets the requirements of Federal Specification HH-I-552 Type 1, Class A.

### STANDARD SIZES

| Nominal Thickness,<br>inches | Pipe Sizes, inches |                   |
|------------------------------|--------------------|-------------------|
|                              | Copper Tubing      | Steel Pipe        |
| 3/4                          | 3/4 -3             | 3/4 -3            |
| 1                            | 3/4 -6             | 3/4 -6            |
| 1 1/2                        | 3/4 -6             | 3/4 -6, 8, 10, 12 |
| 2                            | 3/4 -6             | 3/4 -6, 8, 10, 12 |

### RECOMMENDED THICKNESSES

#### HEATING PIPING INSULATION\*

| Pipe Temperature, F | Continuous Operation |                   | Seasonal Operation  |                   |
|---------------------|----------------------|-------------------|---------------------|-------------------|
|                     | Pipe Size, inches    | Thickness, inches | Pipe Size, inches   | Thickness, inches |
| 100-199             | 3/4 thru 2           | 3/4               | 3/4 thru 6          | 3/4               |
|                     | 2 1/2 thru 6 over 6  | 1                 | over 6              | 1 1/2             |
| 200-300             | 3/4 thru 2           | 1 1/2             | 3/4 thru 3          | 3/4               |
|                     | over 2               | 2                 | 3 1/2 thru 6 over 6 | 1 1/2             |

\*Thicknesses are optimum calculated on an economic basis for heat conservation under average operating conditions.

#### PLUMBING PIPING INSULATION\*\*

| Pipe Temperature, F | Pipe Size, inches | Thickness, inches |
|---------------------|-------------------|-------------------|
| 35-39               | to 3 over 3       | 1                 |
| 40-49               | to 1 1/2 over 6   | 1 1/2             |
| 50-60               | to 3 over 3       | 3/4               |

\*\*Thicknesses are calculated to prevent condensation at ambient conditions of 85F and 80% R.H. (dew point 78F).

*An Insulation for Every Commercial and Industrial Purpose*



# J-FOAM

## Specification Data

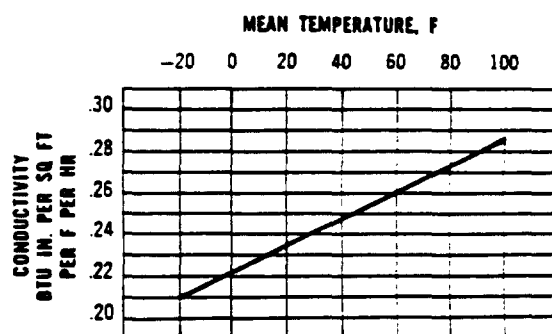
### PHYSICAL PROPERTIES

|                                 |                     |
|---------------------------------|---------------------|
| Density                         | 1.0 lbs per cu ft   |
| Compressive Strength            |                     |
| Load to compress 5%             | 10.0 psi            |
| Compression under load, 500 psf | .028 in.            |
| Tensile Strength                | 10.0 psi            |
| Water Absorption, 1" submersion |                     |
| 24 hours                        | 1.7% by vol         |
| 1 week                          | 2.4% by vol         |
| 8 weeks                         | 4.0% by vol         |
| Capillarity                     | none                |
| Water Vapor Permeability        | 1.5 perm in.        |
| Maximum Recommended Temperature | 180F                |
| Coefficient of Expansion        | $40 \times 10^{-4}$ |

\*The figures given in this table are average values obtained in accordance with accepted test methods.

NOTE: A form of J-Foam, self-extinguishing according to ASTM D-635-44, is available. Its density averages 1.5 pcf, other properties are essentially the same as those given above.

### THERMAL CONDUCTIVITY



### COMPLIANCE WITH GOVERNMENT SPECIFICATIONS

### PACKAGING INFORMATION

Interim Specification HH-1-00575 (GSA-FSS)

In Bundles — sheets 24" wide

| Thickness, inches | No. Pcs/Ctn | Bd Ft if Sheet Length is: |     |     |     |     |
|-------------------|-------------|---------------------------|-----|-----|-----|-----|
|                   |             | 4'                        | 8'  | 8'  | 10' | 12' |
| 1                 | 27          | 216                       | 324 | 432 | 540 | 648 |
| 1½                | 18          | 216                       | 324 | 432 | 540 | 648 |
| 2                 | 13          | 208                       | 312 | 416 | 520 | 624 |
| 3                 | 9           | 216                       | 324 | 432 | 540 | 648 |
| 4                 | 6           | 192                       | 288 | 384 | 480 | 576 |
| 6                 | 4           | 192                       | 288 | 384 | 480 | 576 |

### STANDARD SIZES

| Length, ft   | Width, inches | Thickness, inches        |
|--------------|---------------|--------------------------|
| 4 through 12 | 12 and 24     | 1, 1½, 2, 3, 4, 6, and 8 |

In Cartons — sheets 24" x 48"

| Thickness, inches | No. Pcs/Ctn | Bd Ft |
|-------------------|-------------|-------|
| 1                 | 24          | 192   |
| 1½                | 16          | "     |
| 2                 | 12          | "     |
| 3                 | 8           | "     |
| 4                 | 6           | "     |
| 6                 | 4           | "     |
| 8                 | 3           | "     |

## INSULATION

## PRODUCT INFORMATION

type: Pipe, Sheet & Lagging

temp limit: -300 to +350F



## J-M ROCK CORK® refrigeration insulation

■ **DESCRIPTION:** Manufactured from mineral wool combined with a water-resistant asphaltic binder which furnishes an ideal base for an asphaltic adhesive or finish, assuring air-moisture-resistant seal.

■ **AVAILABLE FORMS:**

Pipe Insulation — furnished with asphalt-saturated and coated asbestos jacket.

Sheets — furnished 18" x 18" x 1", as well as 18" x 36", in thicknesses from 1½" through 4".

Lagging — furnished 18" long, 2"-6" wide, 1½"-4" thick. Discs available same thicknesses.

■ **USES:** Recommended for cold storage rooms and low temperature piping and equipment.

■ **ADVANTAGES**

**High Moisture Resistance**

Won't absorb moisture under conditions of humidity and condensation usually present in cold storage rooms.

**Sanitary**

Will not absorb or transmit the strongest odors. Won't rot or harbor bacteria.

**Incombustible**

Protects against costly losses due to fire. Passes Columbia Fire Test (see Specification Data).

**Low Conductivity**

Low thermal conductivity (.29 at OF) provides precise temperature control.

**Long Service Life**

Installations made 30 and more years ago still providing satisfactory service.

**Structurally Strong**

Strong and rigid enough to build cold room dividing walls without supporting members.

**Easy to Install**

Light, readily handled, sheets are furnished in large sizes for easy application. Pipe insulation accurately formed for perfect fit.

# INSULATION

type: Brick  
temp limit: 3000F



## J-M INSULATING FIRE BRICK

■ **DESCRIPTION:** Johns-Manville produces six types of Insulating Fire Brick to provide operators and builders of high temperature equipment six opportunities to get the one insulating fire brick that's right for a given service.

Each type of J-M Insulating Fire Brick has the correct balance of thermal and physical properties for its recommended service. All six types offer light weight, low conductivity and high structural strength.

Made from high quality refractory clays (plus alumina in the case of JM-3000), these insulating fire brick contain a carefully graded organic filler which is burned out during manufacture to give a uniform, controlled pore structure.

### ■ AVAILABLE TYPES:

JM-3000\*—for temperatures to 3000F exposed.

JM-28—for temperatures to 2800F exposed.

JM-26—for temperatures to 2600F exposed.

JM-23—for temperatures to 2300F exposed.

JM-20—for temperatures to 2000F exposed.

JM-1620—for temperatures to 1600F exposed; to 2000F back-up.

\*JM-3000 Insulating Fire Brick is the newest of the six types. It provides long-life insulation at a full 3000F, in back-up or direct exposure service, and is molded from specially selected kaolin clays plus alumina.

■ **USES:** Recommended for use as refractory lining or as back-up insulation behind other refractory protection in kilns, furnaces, flues, refining vessels, regenerators, gas producers and mains, soaking pits, stress-relieving furnaces, reactor chambers and similar high temperature industrial equipment.

### ■ ADVANTAGES

#### High Insulating Value

The light weight and high insulating value of J-M Insulating Fire Brick make possible thinner furnace walls, improved efficiency and lower operating costs.

#### Quick Heat Up

Furnaces can be brought up to operating temperatures with unusual speed, resulting in increased production.



# INSULATION

type: Brick  
temp limit: 2500F

## J-M SIL-O-CEL® INSULATING BRICK

■ **DESCRIPTION:** Made from diatomaceous silica, a material composed of millions of microscopic cells that offer maximum resistance to heat flow. Sil-O-Cel Insulating Brick are particularly useful where high load-bearing characteristics are required. Sil-O-Cel Insulating Brick are furnished in three types for use as back-up insulation behind refractory fire brick linings or behind insulating fire brick linings. The new Sil-O-Cel 16L brick may also be used for exposed as well as back-up service.

■ **AVAILABLE TYPES:**

Sil-O-Cel Insulating Brick are furnished in three different types as follows:

Sil-O-Cel Super—for temperatures to 2500F back-up only.

Sil-O-Cel C-22—for temperatures to 2000F back-up only.

Sil-O-Cel 16L—for temperatures to 1600F back-up or exposed.

■ **USES:** Sil-O-Cel Insulating Brick are recommended for use as back-up insulation in furnaces, kilns, hot blast stoves, soaking pits, boiler walls, oil heaters, regenerators, and similar high temperature equipment in the steel, chemical, ceramic, power, petroleum and glass industries.

■ **ADVANTAGES**

**Good  
Insulating Value**

Used as back-up insulation, Sil-O-Cel Insulating Brick make it possible to reduce the necessary thickness of the exposed refractory as much as one-third. This results in substantial savings in furnace wall construction for all the types of high temperature equipment for which these brick are recommended.

**High Load  
Bearing Strength**

Sil-O-Cel Insulating Brick are made from diatomaceous silica, a natural fossilized material which imparts to the finished brick great strength. The Sil-O-Cel C-22 brick, for example, has a cold crushing strength of 700 lbs per square inch.

# INSULATION

type: Castable  
temp limit: 3000F

## J-M FIRECRETE® hydraulic setting refractory cement

■ **DESCRIPTION:** Johns-Manville produces seven types of hydraulic setting castable refractory cements to meet practically every castable requirement for temperatures through 3000F. Each of these refractories is economical and efficient in the service range for which it is recommended. All harden rapidly and are highly resistant to spalling.

### ■ AVAILABLE TYPES:

**3X Firecrete**—For service to 3000F. Composed principally of high aluminous materials calcined at high temperatures. Recommended for casting thicknesses of 2 inches or more.

**H.T. Firecrete**—For service to 2800F. Recommended for casting thicknesses 2 inches or more.

**Standard Firecrete**—For service to 2500F. Develops exceptional strength on air curing. Can be used to cast thicknesses as thin as 1 inch.

**L.W. Firecrete**—A light weight, insulating refractory concrete for service to 2400F. 75 lbs of dry material required for one cubic foot.

**CA Insulating Firecrete**—A light weight, low iron content refractory for use in controlled atmospheres. For service to 2600F.

**No. 20 Firecrete**—Similar to L.W. Firecrete but lighter. 58 lbs of dry material required for one cubic foot. Service to 2200F.

**C-31 M Refractory Cement**—A chrome base castable refractory for service to 3000F.

■ **USES:** Firecrete is used extensively for monolithic furnaces and linings and is recommended for such special shapes as those required for burner rings, baffle tile, header protection tile, pipe linings, furnace bottoms and similar installations.

### ■ ADVANTAGES

**Hardens  
Rapidly**

Firecrete permits casting and use of any desired shape within 24 hours.

**Resists  
Spalling**

All seven types are highly resistant to spalling.

**Negligible  
Shrinkage**

Firecrete has no drying shrinkage and only negligible fire shrinkage at recommended temperatures.

**Easy and  
Economical to Use**

The adaptability of Firecrete makes possible the easy construction of monolithic furnaces, linings and the like which would otherwise require the use of special shapes or involve costly cutting and fitting of brick.

# INSULATION

+ 3000F

type: Gunning-Troweling  
temp limit: 3000F



## J-M BLAZECRETE® hydraulic setting refractory cement

■ **DESCRIPTION:** Four types of dry monolithic, hydraulic setting refractory cements have been developed and produced by Johns-Manville for gunning and slap-troweling applications.

These four refractories are especially adaptable for gun application in building new refractory linings and repairing old ones. They adhere readily with a minimum of loss when "shot" in place. Mixed with water at the gun nozzle, they are pneumatically projected with great force, resulting in a dense, homogeneous lining.

Blazecrete is equally effective for heavy patching by troweling, especially where brickwork has eroded deeply. It eliminates the laborious ramming or tamping required with "plastics," and patches need not be prefired.

### ■ AVAILABLE TYPES:

**3X Blazecrete**—For service to 3000F. High alumina content. Particularly adaptable for gun applications and for heavy patching by slap-troweling.

**Standard Blazecrete**—For service to 2400F. Alumina silicate base.

**L.W. Blazecrete**—For service to 2000F. Light weight, alumina silicate base refractory. Used extensively for stack linings, heaters and other appli-

cations where gunning mix with low rebound loss is required.

**C-2 Refractory Cement**—For service to 2300F. Used to advantage in making a protective abrasion-resistant refractory surface over L.W. Blazecrete.

■ **USES:** Recommended for lining or patching forge furnaces, ashpits, cyclones, heaters, boilers, oil refining equipment, furnace bottoms, ladles and similar applications. L.W. Blazecrete is extensively used on tanks, structural steel and skirts for fire protection purposes.

### ■ ADVANTAGES

**Hardens  
Rapidly**

Applications ready for use within 24 hours of gunning or slap-troweling.

**Resists  
Spalling**

All four types are highly resistant to spalling.

**Easy to Use**

Can be applied by gunning or slap-troweling.

# INSULATION

+ 3000F

type: Fill  
temp limit: 2400F



## J-M AGGREGATES AND FILLS

■ **DESCRIPTION:** Johns-Manville lightweight aggregates and fills are available in a wide selection for temperatures through 2400F.

JM-2000 and JM-2400 L.W. Aggregates may be mixed with calcium aluminate cement to form an insulating refractory concrete for various operating conditions. Sil-O-Cel C-3 may be mixed with calcium aluminate or portland cement for lower temperature conditions. By selection of the aggregate,

an insulating refractory concrete can be made with the characteristics desired for constructing core, japanning and enameling ovens, foundations and bases of heated equipment, furnace doors, and many special shapes. In addition, all materials listed below may be used as fills for insulating irregular spaces in high temperature equipment, making it possible to conserve heat where other forms of insulation cannot be economically installed.

### AVAILABLE TYPES

| Name                           | Composition                                                      | Temperature limit, F | Approx density to which fills are normally packed, lbs per cu ft | Packaging  |
|--------------------------------|------------------------------------------------------------------|----------------------|------------------------------------------------------------------|------------|
| JM-2400<br>L.W. Aggregate      | al. silicate                                                     | 2400                 | 50                                                               | 65-lb bags |
| JM-2000<br>L.W. Aggregate      | al. silicate                                                     | 2000                 | 41                                                               | 50-lb bags |
| Sil-O-Cel C-3                  | calcined, coarse-graded diatomaceous silica                      | 2000                 | 31                                                               | 50-lb bags |
| Sil-O-Cel<br>Insulating Powder | finely ground diatomaceous silica                                | 1600                 | 17                                                               | 50-lb bags |
| Sil-O-Cel<br>Coarse Grade      | similar to Sil-O-Cel Insulating Powder, but more coarsely ground | 1600                 | 22                                                               | 50-lb bags |

+ 3000F  
**INSULATION**

type: Refractory Felt  
temp limit: 2000F

**J-M CERAFELT refractory fiber felt**

■ **DESCRIPTION:** J-M Cerafelt is a lightweight, refractory-fiber insulation notable for its excellent thermal and chemical stability. Made predominantly of alumina and silica, it combines lightness, heat resistance, low conductivity and high sound-absorption qualities.

■ **AVAILABLE FORMS:** Furnished in densities ranging from 3 to 24 lbs per cu ft. Also prefabricated fully encased in heat-resistant metal foils or meshes to fit any industrial shape.

■ **USES:** Recommended for a great variety of high temperature applications including gas turbines, refractory linings for domestic oil burner combustion chambers, high temperature packing, and similar industrial uses.

■ **ADVANTAGES****High Heat  
Resistance**

Will withstand continuous exposure to a full 2000F.

**Low Thermal  
Conductivity**

Unusually low conductivity at high temperatures due to opacity of basic fibers to infra-red radiation.

**Light  
Weight**

Weights as little as 1/40th equal volume of hard fire brick.

**Chemically  
Stable**

Non-alkaline and chemically stable. Contains no corrosion-promoting agents.

**THERMAL CONDUCTIVITY**

| Density, lbs<br>per cu ft | MEAN TEMPERATURE, F |     |     |     |     |     |      |      |
|---------------------------|---------------------|-----|-----|-----|-----|-----|------|------|
|                           | 300                 | 400 | 500 | 600 | 700 | 800 | 900  | 1000 |
| 3                         | .39                 | .46 | .55 | .65 | .76 | .89 | 1.02 | 1.16 |
| 4                         | .37                 | .44 | .52 | .61 | .71 | .82 | .94  | 1.07 |
| 6                         | .35                 | .41 | .47 | .54 | .62 | .71 | .81  | .92  |
| 8                         | .34                 | .39 | .45 | .51 | .57 | .64 | .71  | .80  |
| 10                        | .34                 | .38 | .43 | .49 | .55 | .61 | .68  | .75  |
| 12                        | .34                 | .38 | .43 | .48 | .53 | .59 | .65  | .72  |
| 18                        | .32                 | .36 | .40 | .45 | .50 | .55 | .60  | .66  |
| 24                        | .31                 | .35 | .40 | .44 | .48 | .53 | .58  | .63  |

CONDUCTIVITY: BTU IN. PER SQ FT PER F PER HR

**STANDARD DENSITIES  
AND THICKNESSES**

| Type     | Density, lbs<br>per cu ft | Available Thicknesses, inches |     |     |     |     |   |       |   |
|----------|---------------------------|-------------------------------|-----|-----|-----|-----|---|-------|---|
|          |                           | 1/8                           | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| CRF-300  | 3                         |                               |     | X   | X   | X   | X | X     | X |
| CRF-400  | 4                         |                               |     | X   | X   | X   | X | X     | X |
| CRF-600  | 6                         |                               |     | X   | X   | X   | X | X     |   |
| CRF-800  | 8                         |                               | X   | X   | X   | X   | X | X     |   |
| CRF-1000 | 10                        |                               | X   | X   | X   | X   | X | X     |   |
| CRF-1200 | 12                        | X                             | X   | X   | X   | X   | X | X     |   |
| CRF-1800 | 18                        | X                             | X   | X   | X   |     |   |       |   |
| CRF-2400 | 24                        | X                             | X   | X   |     |     |   |       |   |

**STANDARD SIZES**

|                  | Length, feet | Width, inches |
|------------------|--------------|---------------|
| CRF-300—CRF-600  | 4, 8 and 26  | 42            |
| CRF-800—CRF-2400 | 4 and 8      |               |

# INSULATION

+ 3000°F

type: Flat & Pre-Curved  
Sheets

temp limit: 600°F



## J-M ASBESTOCITE® asbestos-cement sheets

■ **DESCRIPTION:** J-M Asbestocite is a strong, flexible, monolithic industrial sheet material especially developed for use wherever severe operating conditions call for outstanding strength and permanence. Made of asbestos and cement and formed under tremendous pressure, it is an attractive natural gray in color, and has a hard, smooth finish on one side. Asbestocite is completely inorganic and will not burn, rot or corrode. Equally stable indoors or out, it withstands extreme temperature and atmospheric variations without damage.

■ **AVAILABLE FORMS:** Furnished in flat and pre-curved sheets in sizes ranging from 4' x 4' to 4' x 12', and in thicknesses (depending on sheet size) from 1/8" to 1/2".

■ **USES:** Recommended for a variety of industrial and commercial applications including the following: As a protective facing over cold storage room insulation; as a weatherproof facing over insulation on outdoor tanks and vessels; for cooling towers; for fume hoods and ducts.

Under normal conditions Asbestocite needs no paint or other protective coating to maintain its neat appearance and enduring protection. Its stone-like finish is unaffected by years of wear and tear, and it requires practically no maintenance. Where desired, for decorative purposes, it may be readily painted with any good quality alkaline-resistant type paint.

### ■ ADVANTAGES

#### Weather Resistant

Exposed to sun, wind, rain or snow, Asbestocite will not deteriorate. May be subjected to alternate freezing and thawing without danger of spalling or chipping.

#### Structurally Strong

Formed under tremendous pressure, then hydraulically re-pressed for extra strength.

#### Fireproof

Approved by the Underwriters' Laboratories as incombustible. Asbestocite serves as a highly effective barrier to the spread of fire.

#### Practically Maintenance Free

Under normal conditions will retain its neat appearance and enduring protection without painting or other preservative treatment.

#### Won't Corrode

Immune to most corrosive elements found in industrial atmospheres and will not cause corrosion when in contact with metals.

#### Permanent

Asbestocite is practically indestructible. Completely inorganic, it will not mold or decay from prolonged dampness, and excessive dryness will not cause it to powder or crack.

## INSULATION

+ 3000F

type: Protective Coating  
temp limit: 250F

## J-M INSULKOTE<sup>®</sup> weather protective coating

■ **DESCRIPTION:** Developed as high quality protective coatings, J-M Insulkotes are compounded of selected and processed bitumens, asbestos fiber and mineral fillers. These formulations were chosen after careful development and testing to give maximum protection at lowest applied cost to insulated tanks and process equipment. Insulkote effectively seals out water, preserves maximum insulation efficiency, helps prevent rusting and corrosion of expensive equipment.

### ■ AVAILABLE TYPES:

Non Water-Vapor Barrier – Insulkote ET\* and EG\*\* are non-burning, weatherproof coatings for use over insulation where "breathing" is required.

Water-Vapor Barrier—Insulkote ST\* and SG\*\* are weatherproofing and vapor barrier coatings for insulations on refrigerated equipment. Insulkote SG is an excellent anti-corrosion coating.

Combination Purpose – Insulkote SGC\*\*\* and EGC\*\*\* are coatings which afford protection against weather and corrosive atmospheric condi-

tions, and will prevent condensation under most adverse conditions.

\*Trowel application. \*\*Spray gun application  
\*\*\*Trowel or spray gun application.

■ **USES:** Recommended for weather-protecting insulated vessels, tanks, piping and equipment.

### ■ ADVANTAGES

#### Durable

Insulkote effectively seals out water, preserves maximum insulation efficiency, helps prevent rusting and corrosion of expensive equipment.

#### Keeps Out Water

Years of service in the field have shown that Insulkote resists acid or alkaline atmospheres and will stand up under the most adverse weather conditions. Its composition minimizes surface cracking and crazing upon sudden temperature changes. A jet black material will not fade after it is applied—patches will not contrast with weathered coating.

#### Easily Applied

Furnished ready-mixed in two consistencies to facilitate quick, easy trowel or spray application.

| Type                             | Insulkote ET     | Insulkote EG     | Insulkote ST     | Insulkote SG     | Insulkote EGC    | Insulkote SGC    |
|----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Application                      | emulsion         | emulsion         | solvent          | solvent          | emulsion         | solvent          |
| Weight per gal                   | trowel           | gun**            | trowel           | gun**            | trowel or gun**  | trowel or gun**  |
|                                  | 10 lbs           | 10 lbs           | 9.5 lbs          | 9.5 lbs          | 7.5 lbs          | 7 lbs            |
| Coverage as applied              | 16 gal per 100   | 16 gal per 100   | 8 gal per 100    | 6 gal per 100    | 16 gal per 100   | 16 gal per 100   |
|                                  | sq ft 1/4" thick | sq ft 1/4" thick | sq ft 1/4" thick | sq ft 1/4" thick | sq ft 1/4" thick | sq ft 1/4" thick |
|                                  | 50               | 50               | 25               | 25               | 40               | 20               |
| Percent shrinkage (volumetric)   |                  |                  |                  |                  |                  |                  |
| Water vapor penetration in perms |                  |                  |                  |                  |                  |                  |
| —for recommended thickness       |                  |                  |                  |                  |                  |                  |
| Temperature use range            | 2 to .5          | 4 to .7          | .0 to .1         | .1 to .2         | ---              | ---              |
|                                  | 100 to 250F      | 100 to 250F      | up to 250F       | up to 250F       | 100 to 250F      | up to 250F       |

Code: E—emulsion type; S—solvent type; T—trowel consistency; G—spray gun consistency; C—cork filler

\*The figures given in this table are average values obtained in accordance with accepted test methods.

\*\*Spray gun application involves some loss through bounce and "over spray." Amount of loss varies with air velocities and types of surface.

All solvents have some degree of toxicity and proper ventilation should be provided where material is used in enclosed spaces.

# INSULATION

type: Asbestos Papers  
temp limit: 400F

## J-M ASBESTOS PAPERS

■ **DESCRIPTION:** You can save space, time and money by using Johns-Manville Asbestos Papers to protect against fire, heat or corrosion. They replace bulkier, less resistant materials in many applications. Various asbestos papers have been developed by J-M to fit the needs of industry. Their main differences are in the quality of fiber and type of binder used. The binder content is held to a minimum to provide the maximum advantages of asbestos.

### ■ AVAILABLE TYPES:

**Commercial Asbestos Paper and Rollboard** — A short fiber paper with high fiber content (minimum 95%). For use as a thermal insulation or safety covering for heating ducts.

**Fibroid Asbestos Paper**—Similar to above but specially processed for electrical applications. Primarily a base sheet or inorganic carrier for treatment with dielectric resins and varnishes.

**Long Fiber Asbestos Paper**—Made with high grade long asbestos fiber (minimum fiber content 88%). For use as a thermal insulation; gasketing; base sheet for saturating.

**High Strength Fibroid Asbestos Paper**—Similar to long fiber asbestos paper but specially processed for Class B electrical applications. A base sheet for saturating with electrical varnishes and resins to form a dielectric.

**Armature Reinforced Asbestos Paper** — Asbestos paper integrally combined on the paper machine

with a reinforcement of strong, cotton scrim cloth. A base sheet for treatment with electrical resins and varnishes.

**Special Long Fiber Asbestos Paper for Electrolytic Cells**—A high quality paper, uniform throughout, for use as diaphragms in electrolytic cells.

**Doublex Asbestos Paper**—Contains inorganic binder, will not burn, char or smoke. High tensile strength, resists tearing. Developed for use as neon sign pattern paper. Also used as liner for foundry funnels and pouring gates.

**Asbestos Welding Paper**—A 32 lb paper, 1/16" thick, used to protect adjacent parts from heat, smoke, sparks during welding.

**Type GT Asbestos Paper**—Asbestos paper integrally combined on the paper machine with a reinforcement of strong glass threads. Almost 100% inorganic, it can be used "as is" wherever a strong heat-and-flame-resistant sheet is needed.

### ■ ADVANTAGES

**Excellent  
Mechanical Properties**

Fast, easy to apply and safe to handle; amply strong for most needs.

**Heat Resistant**

J-M Asbestos Papers will withstand heat (up to 400F) that would damage conventional papers and roll boards.

## INSULATION



type: Sheet  
temp limit: 1200F

## J-M ASBESTOS MILLBOARD insulating sheet material

■ **DESCRIPTION:** Johns-Manville Asbestos Millboard is a dense, rigid sheet or board material formed of asbestos fibers and a small amount of binder. A natural light gray in color, Millboard sheets are furnished in standard sizes of 42" x 48", in thicknesses ranging from 1/32" to 1/2". Cut pieces can also be supplied.

### ■ AVAILABLE FORMS

No. 106 Millboard—A general purpose, high utility millboard suitable for most uses. It will withstand temperatures to 800F.

No. 102 Millboard—A higher quality millboard than No. 106. Will withstand temperatures to 1000F.

No. 219 Millboard—This is a premium grade millboard, specially treated for greater strength. Suitable for temperatures to 1100F, it can be used up to 1800F where some loss of strength is not detrimental.

C Grade Millboard—This millboard contains an especially long grade of asbestos fiber. It is suitable for temperatures to 1200F; embrittlement occurs above this limit. Where brittleness is not objectionable, may be used at temperatures up to 1800F.

Silicated Millboard—All grades of millboard can be specially treated to increase surface hardness. Where such sheets are required, the word "silicated" should appear on the order before the millboard type.

Special—Millboards for special purposes can be tailored to service requirements.

■ **USES:** J-M Asbestos Millboard is recommended for applications which require a sheet or board insulation for protection against fire, heat, acid fumes, etc. Frequently used as a fire-resistant lining for floors, partitions, ceilings, stoves and grates. It has been found particularly valuable in the steel industry where literally scores of uses have been discovered for this versatile material.

### ■ ADVANTAGES

#### Versatile

Adapted to literally scores of industrial applications.

#### Fireproof

Made of asbestos, the world's most famous fireproof material.

### THICKNESSES, TOLERANCES AND WEIGHTS\*

| Thickness,<br>inches | Tolerance,<br>inches ± | Lbs per 42" x 48" sheet       |         |
|----------------------|------------------------|-------------------------------|---------|
|                      |                        | No. 106, 102<br>and "C" Grade | No. 219 |
| 1/32                 | 0.007                  | 2.5                           | 1.5     |
| 3/64                 | 0.008                  | 3.5                           | 2.5     |
| 1/16                 | 0.008                  | 4.6                           | 3.4     |
| 3/32                 | 0.008                  | 6.0                           | 4.4     |
| 1/8                  | 0.009                  | 7.0                           | 5.3     |
| 5/64                 | 0.014                  | 9.0                           | 7.3     |
| 3/16                 | 0.015                  | 11.3                          | 9.2     |
| 1/4                  | 0.016                  | 13.3                          | 11.1    |
| 5/16                 | 0.025                  | 17.6                          | 15.0    |
| 3/8                  | 0.029                  | 21.4                          | 18.7    |
| 7/16                 | 0.034                  | 25.2                          | 22.6    |
| 1/2                  | 0.045                  | 32.5                          | 30.3    |

\*Actual weights may vary plus or minus 10 percent.

call an  
**AUTHORIZED J-M CONTRACTOR**  
for expert, dependable application  
of Johns-Manville  
insulations...



When you pay for top-quality insulation, back up your investment with the best installation service money can buy. Today, with high fuel and maintenance costs, it is especially important to place your insulation job in skilled hands. The scientific application of J-M quality insulations by J-M Insulation Contractors will assure you of the maximum return on your insulation investment for years to come. Moreover, you get undivided responsibility for *all* your insulation requirements.

Johns-Manville has established J-M Insulation Technical Service Units and J-M Insulation Contract Units throughout the country to serve you—units staffed with men who understand insulation engineering and with skilled applicators who are thoroughly trained in proven Johns-Manville methods.

Working with J-M materials and J-M Insulation Engineers, these contractors *know* how to apply Johns-Manville insulations correctly to insure long, trouble-free performance. You can have the utmost confidence in their ability to handle your insulation application from start to finish.

And remember this important point: When your architect or engineer specifies Johns-Manville insulations, any J-M Insulation Contractor in the country will be able to give you a quick, accurate bid, regardless of the size or location of the job.



**Johns-Manville**