Johns-Manville

JOHNS-MANVILLE SALES CORP.
560 So. Third Ave. Mt. Vernon, N. Y. 10550
Phone: 914 699-5464 N.Y.C. 212-792-1926

IN-244A 11-63

LITHO IN U.S.A.

Johns-Manville

+3000F

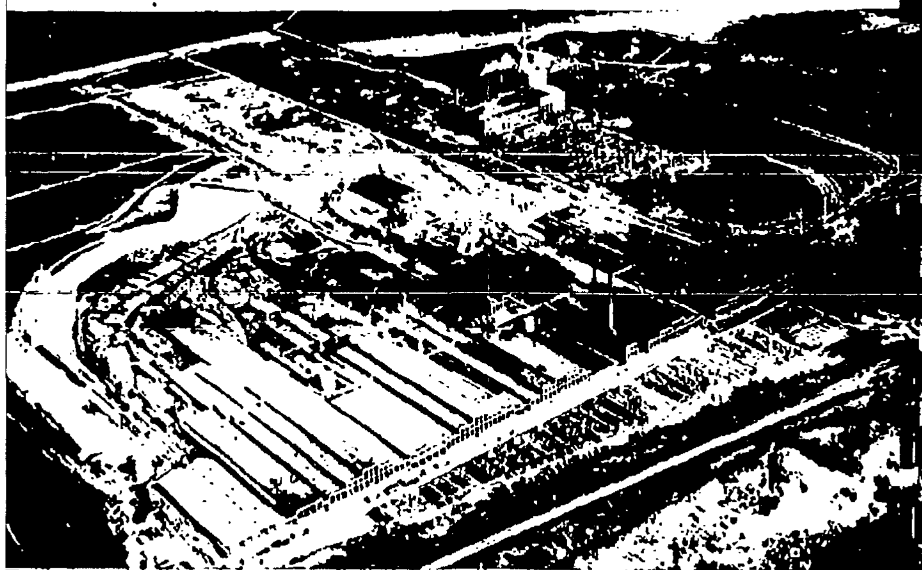
-400F

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

PLAINTIFF'S
EXHIBIT
JM-2239

292515

Johns-Manville brings you the benefit of more than a century's experience in the development and manufacture of quality insulating materials...



Since 1858, Johns-Manville has developed [illegible] methods and machines for [illegible] insulations and [illegible] [illegible] and commercial [illegible] today, out of a total of forty-four manufacturing plants owned and operated by Johns-Manville, fourteen are devoted to the production of industrial insulations and related products.

From these busy plants, of which the one at Waukegan, Illinois, illustrated at the left, is a typical example, flow the Johns-Manville quality insulating materials that contribute so much to the efficient and economical operation of American industry. At every one of these locations modern methods of mass production and quality control assure product uniformity and top value for your insulation dollar. And all are strategically located to provide the best possible service to all sections of the country.

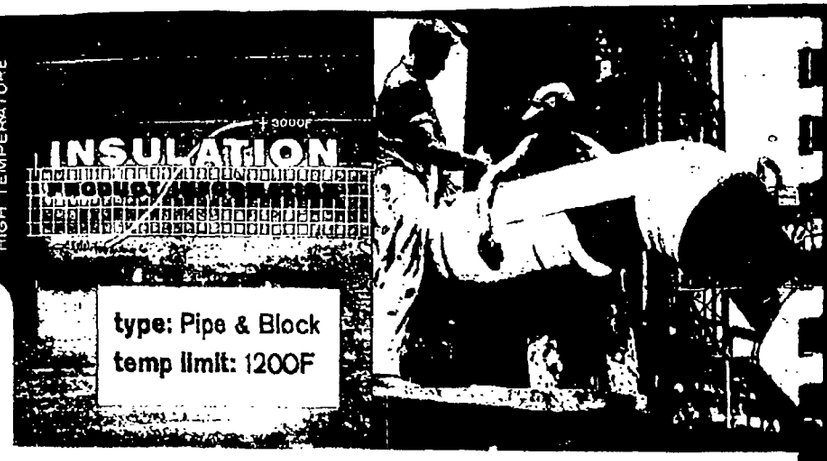
TABLE OF CONTENTS


| PRODUCT | PAGE |
|---|---|
| INDUSTRIAL & HIGH TEMPERATURE | 2-23 |
| Thermobestos | 2 |
| Thermobestos Extended Legs | 5 |
| Metal-On | 6 |
| Metal-On Tank Panels | 8 |
| 85% Magnesia | 9 |
| Superex | 10 |
| Superex-M | 12 |
| Marinite | 14 |
| Banroc Blankets | 16 |
| H. T. Banroc | 18 |
| Banroc Block | 19 |
| Unbonded B-Fiber Blankets | 20 |
| Metal-K | 22 |
| PLUMBING, HEATING & AIR CONDITIONING | 24-43 |
| Micro-Lok | 24 |
| Aerotube (Sheet) | 27 |
| Aerotube (Pipe) | 28 |
| Micro-Aire | 30 |
| Microlite Duct Insulation | 32 |
| Spintex | 34 |
| MicroTuf | 36 |
| Micro-Bar | 38 |
| Microlite Duct Liner | 40 |
| Coated Spintex | 42 |
| REFRIGERATION | 44-49 |
| Zero-Lite | 44 |
| Micro-Cel T-4 & T-2 | 46 |
| Oil-Free Spun Banroc Loose | 48 |
| Zero-Foam | 49 |
| INSULATING FIRE BRICK & REFRACTORIES | 50-61 |
| Insulating Fire Brick | 50 |
| Sil-O-Cel | 52 |
| Firecrete | 54 |
| Blazecrete | 56 |
| Aggregates & Fills | 58 |
| Bonding Mortars | 59 |
| Cerafelt | 60 |
| Asbestos Millboard | 61 |
| FINISHES & WEATHERPROOFING MATERIALS | 62-69 |
| Cements & Fills | 62 |
| Asbestocite | 64 |
| Insulkote | 66 |
| Weatherproofing Jackets | 68 |




292516

INDUSTRIAL & HIGH TEMPERATURE




**type: Pipe & Block**
**temp limit: 1200F**

# J-M THERMOBESTOS® pipe and block insulation

**DESCRIPTION:** A molded, high temperature pipe and block insulation. J-M Thermobestos is composed of hydrous calcium silicate bonded with asbestos fibers. It is a completely inorganic insulating material which, because of its light weight, low thermal conductivity, great structural strength and insolubility in water, is ideal for high temperature piping and equipment

**AVAILABLE FORMS:** Thermobestos is furnished in both sectional pipe insulation and block form. The pipe insulation comes in a complete selection of sizes up to 24" x 3" half-sections. Larger sizes are available in quad segments from 25" to 33" P.S in 1½, 2, 2½ and 3" thicknesses. Beveled and scored blocks are available for larger diameters. Regular blocks furnished in 6", 9", 12" x 18" widths by 36" length, in a full range of thicknesses.

**USES:** Especially recommended for use in the power generation and process industries on indoor and outdoor piping and equipment operating at temperatures to 1200F. Thermobestos is light enough for easy handling and fast application. Repeated wettings have no permanent effect on it which makes it ideal for installations subjected to weather, or for insulating underground steam lines. Because it will not burn or carry flame, it may also be advantageously specified for use in the presence of inflammable gases and liquids.

## ADVANTAGES

**Exceptional Strength**

Similar in chemistry and composition to a very fine concrete. Thermobestos will withstand unusual operating abuse without appreciable damage.

**Extreme Lightness**

Thermobestos is as light as many insulating materials possessing a fraction of its strength and durability.

**Chemically Stable**

100% inorganic, will neither burn nor rot.

**Not Damaged by Water**

Can be soaked in water without damage. After drying, conductivity will be as good as new.

**Easy Application**

Thermobestos is purposely made in large blocks and half-sections to facilitate handling and reduce number of joints.

**Low Conductivity**

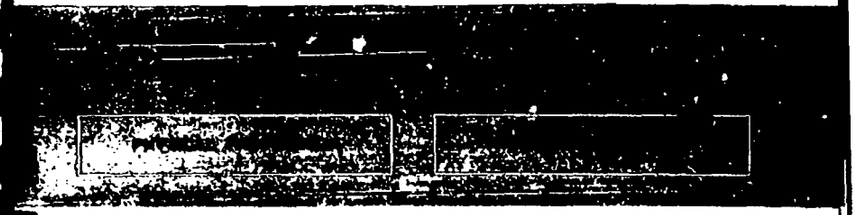
Thermobestos offers the lowest k factor of all insulations in general use throughout the power generation and process industries.



292518

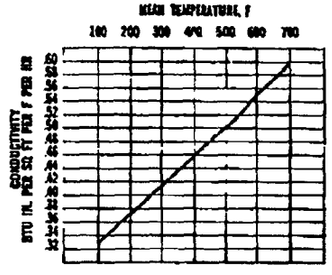
292518

# THERMOBESTOS
## Specification Data



| | |
|---|---|
| Density (dry) | 11 lbs per cu ft |
| Transverse Strength (modulus of rupture) | 83 psi |
| Compressive Strength (based on 2" thickness of block) | 185 psi to produce 5% compression |
| Linear Shrinkage | 1.8% 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.




**COMPLIANCE WITH GOVERNMENT SPECS**

Pipe Insulation:
MIL-I-2781 C
Grade I, class b, to 500F
Grade II, class d, to 750F
Grade III, class e, type I and I, to 1050F
FEDERAL HH-I-523 A Class 2, to 1"dia

Block Insulation:
MIL-I-002848 B
Class 1, to 500F
Class 2, to 1000F
FEDERAL HH-I-523 A Class 1, to 1200F

**COMPLIANCE WITH ASTM STANDARDS**

Pipe Insulation:
C345-54T, to 1200F

Block Insulation:
C344-54T, to 1200F



*An Insulation for Every Commercial and Industrial Purpose*

# THERMOBESTOS
## Specification Data

## Pipe Insulation

### RECOMMENDED THICKNESSES

[illegible]

### STANDARD SIZES

| Length, Inches | Nominal Thickness, Inches | For copper tubing |
|---|---|---|
| 36 | Nominal 1 from ½" up to & including 6" pipe size only*; 1½, 2, 2½, 3, 3½ & 4 | To fit straight runs of copper tubing with nom. diameter ⅝ to 3" |

## Block Insulation

### RECOMMENDED THICKNESSES†

| Temperature of Surface, F | 100 to 199 | 200 to 299 | 300 to 399 | 400 to 499 | 500 to 599 | 600 to 699 | 700 to 799 | 800 to 899 | 900 to 999 | 1000 to 1099 | 1100 to 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nominal Thickness, Inches** | | | | | | | | | | | |
| **Utility—Steam Generation** | | | | | | | | | | | |
| | 1½ | 1½ | 2 | 2½ | 3 | 3 | 3½ | 4 | 4 | 4½ | 4½ |
| **Process** | | | | | | | | | | | |
| | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2 | 2½ | 2½ | 3 |
| **Commercial—Full Year Operation** | | | | | | | | | | | |
| | 1½ | 2½ | 3½ | 4 | 4½ | – | – | – | – | – | – |
| **Commercial—Seasonal Operation** | | | | | | | | | | | |
| | 1 | 1 | 1½ | 2 | 2½ | – | – | – | – | – | – |

Note: For special sizes and curved blocks consult your nearest J-M office.

†Tabulated thicknesses are optimum thicknesses calculated on an economic basis for heat conservation under average operating conditions and where adequate temperature control. Unusual conditions may warrant the use of other thicknesses.

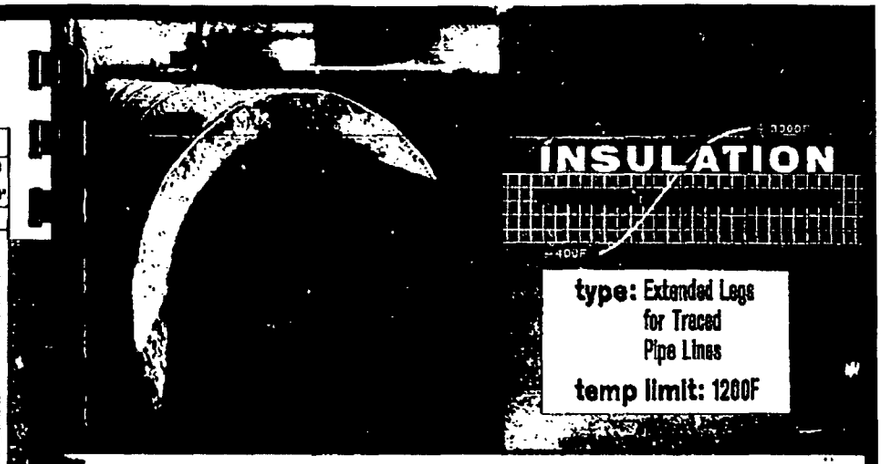
### STANDARD SIZES

| Length, Inches | Width, Inches | Thickness, Inches |
|---|---|---|
| 36 | 6, 9, 12 and 18 | 1, 1½, 2, 2½, 3, 3½ and 4 |

| Nominal Pipe Size, Inches | Temperature of Pipe, F: 100 to 199 | 200 to 299 | 300 to 399 | 400 to 499 | 500 to 599 | 600 to 699* | 700 to 799* | 800 to 899* | 900 to 999* | 1000 to 1099* | 1100 to 1200* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nominal Thickness, Inches** | | | | | | | | | | | |
| **Utility—Steam Generation** | | | | | | | | | | | |
| 1½ & less | 1 | 1 | 1½ | 2** | 2** | 2½ | 2½ | 2½ | 3 | 3 | 3 |
| 2 | 1 | 1 | 1½ | 2** | 2** | 2½ | 2½ | 3 | 3 | 3 | 3½ |
| 2½ | 1 | 1 | 1½ | 2** | 2** | 2½ | 2½ | 3 | 3 | 3½ | 3½ |
| 3 | 1 | 1 | 1½ | 2** | 2** | 2½ | 3 | 3 | 3 | 3½ | 3½ |
| 3½ | 1 | 1 | 1½ | 2** | 2½** | 2½ | 3 | 3 | 3½ | 3½ | 3½ |
| 4 | 1 | 1 | 1½ | 2** | 2½** | 2½ | 3 | 3 | 3½ | 3½ | 4 |
| 4½ | 1 | 1 | 1½ | 2 | 2½ | 2½ | 3 | 3 | 3½ | 3½ | 4 |
| 5 | 1 | 1½ | 1½ | 2 | 2½ | 2½ | 3 | 3½ | 3½ | 4 | 4 |
| 6 | 1 | 1½ | 2 | 2 | 2½ | 3 | 3 | 3½ | 3½ | 4 | 4 |
| 7 | 1½ | 1½ | 2 | 2 | 2½ | 3 | 3 | 3½ | 3½ | 4 | 4 |
| 8 | 1½ | 1½ | 2 | 2 | 2½ | 3 | 3½ | 3½ | 4 | 4 | 4½ |
| 9 | 1½ | 1½ | 2 | 2½ | 2½ | 3 | 3½ | 3½ | 4 | 4 | 4½ |
| 10 | 1½ | 1½ | 2 | 2½ | 2½ | 3 | 3½ | 3½ | 4 | 4 | 4½ |
| 11 | 1½ | 1½ | 2 | 2½ | 2½ | 3 | 3½ | 3½ | 4 | 4½ | 4½ |
| 12 | 1½ | 1½ | 2 | 2½ | 3** | 3 | 3½ | 4 | 4 | 4½ | 4½ |
| 14 & up | 1½ | 1½ | 2 | 2½ | 3** | 3 | 3½ | 4 | 4 | 4½ | 4½ |
| **Process** | | | | | | | | | | | |
| 1½ & less | 1 | 1 | 1 | 1 | 1 | 1 | 1½ | 1½ | 1½ | 2 | 2 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1½ | 1½ | 1½ | 2 | 2 | 2 |
| 2½ | 1 | 1 | 1 | 1 | 1 | 1½ | 1½ | 1½ | 2 | 2 | 2 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1½ | 1½ | 2 | 2 | 2 | 2½ |
| 3½ | 1 | 1 | 1 | 1 | 1 | 1½ | 1½ | 2 | 2 | 2 | 2½ |
| 4 | 1 | 1 | 1 | 1 | 1 | 1½ | 1½ | 2 | 2 | 2 | 2½ |
| 4½ | 1 | 1 | 1 | 1 | 1½ | 1½ | 1½ | 2 | 2 | 2½ | 2½ |
| 5 | 1 | 1 | 1 | 1 | 1½ | 1½ | 1½ | 2 | 2 | 2½ | 2½ |
| 6 | 1 | 1 | 1 | 1 | 1½ | 1½ | 2 | 2 | 2 | 2½ | 2½ |
| 7 | 1½ | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2 | 2½ | 2½ |
| 8 | 1½ | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2 | 2½ | 2½ |
| 9 | 1½ | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2½ | 2½ | 2½ |
| 10 | 1½ | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2½ | 2½ | 2½ |
| 11 | 1½ | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2½ | 2½ | 3 |
| 12 | 1½ | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2½ | 2½ | 3 |
| 14 & up | 1½ | 1½ | 1½ | 1½ | 1½ | 2 | 2 | 2 | 2½ | 2½ | 3 |
| **Commercial—Full Year Operation** | | | | | | | | | | | |
| 1½ & less | 1 | 1½ | 2 | 2½** | 3** | – | – | – | – | – | – |
| 2 | 1 | 1½ | 2 | 2½** | 3** | – | – | – | – | – | – |
| 2½ | 1 | 2 | 2½ | 3** | 3** | – | – | – | – | – | – |
| 3 | 1 | 2 | 2½ | 3** | 3½** | – | – | – | – | – | – |
| 3½ | 1 | 2 | 2½ | 3** | 3½** | – | – | – | – | – | – |
| 4 | 1 | 2 | 2½ | 3** | 3½** | – | – | – | – | – | – |
| 4½ | 1 | 2 | 2½ | 3** | 3½** | – | – | – | – | – | – |
| 5 | 1 | 2 | 2½ | 3** | 3½** | – | – | – | – | – | – |
| 6 | 1 | 2 | 3 | 3½** | 4** | – | – | – | – | – | – |
| 7 | 1½ | 2 | 3 | 3½** | 4** | – | – | – | – | – | – |
| 8 | 1½ | 2 | 3 | 3½** | 4** | – | – | – | – | – | – |
| 9 | 1½ | 2½ | 3 | 3½** | 4** | – | – | – | – | – | – |
| 10 | 1½ | 2½ | 3 | 3½** | 4** | – | – | – | – | – | – |
| 11 | 1½ | 2½ | 3 | 3½** | 4** | – | – | – | – | – | – |
| 12 | 1½ | 2½ | 3 | 3½** | 4** | – | – | – | – | – | – |
| 14 & up | 1½ | 2½ | 3½ | 4** | 4½ | – | – | – | – | – | – |
| **Commercial—Seasonal Operation** | | | | | | | | | | | |
| 1½ & less | 1 | 1 | 1½ | 1½ | – | – | – | – | – | – | – |
| 2 | 1 | 1 | 1½ | 1½ | – | – | – | – | – | – | – |
| 2½ | 1 | 1 | 1½ | 2** | – | – | – | – | – | – | – |
| 3 | 1 | 1 | 1½ | 1½ | 2** | – | – | – | – | – | – |
| 3½ | 1 | 1 | 1½ | 1½ | 2** | – | – | – | – | – | – |
| 4 | 1 | 1 | 1½ | 1½ | 2** | – | – | – | – | – | – |
| 4½ | 1 | 1 | 1½ | 1½ | 2 | – | – | – | – | – | – |
| 5 | 1 | 1 | 1½ | 1½ | 2 | – | – | – | – | – | – |
| 6 | 1 | 1 | 1½ | 2 | 2 | – | – | – | – | – | – |
| 7 | 1½ | 1½ | 1½ | 2 | 2 | – | – | – | – | – | – |
| 8 | 1½ | 1½ | 1½ | 2 | 2 | – | – | – | – | – | – |
| 9 | 1½ | 1½ | 1½ | 2 | 2 | – | – | – | – | – | – |
| 10 | 1½ | 1½ | 1½ | 2 | 2½ | – | – | – | – | – | – |
| 11 | 1½ | 1½ | 1½ | 2 | 2½ | – | – | – | – | – | – |
| 12 | 1½ | 1½ | 1½ | 2 | 2½ | – | – | – | – | – | – |
| 14 & up | 1½ | 1½ | 1½ | 2 | 2½ | – | – | – | – | – | – |



292519

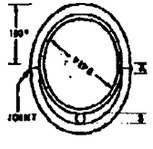



**type:** Extended Legs for Traced Pipe Lines

**temp limit:** 1200F

## J-M THERMOBESTOS® extended legs for steam or electrical traced pipe lines

**DESCRIPTION:** Composed of hydrous calcium silicate bonded with asbestos fibers, J-M Thermobestos with extended legs is a high-temperature pipe insulation molded with ¾" legs on each end of the half circles—or ¾" straight beyond 180° (½ dimension "A" on adjacent sketch). Extended legs provide allowance for the traced line and the dimension of "B", as shown on the sketch, will be ¾". For special size extended legs, consult J-M sales representative.




**AVAILABLE FORMS:** Thermobestos is furnished in a complete selection of sectional pipe sizes up to 24" x 3" thick half-sections. Larger sizes are available in quad segments from 25" to 33" P/S in 1½, 2, 2½ and 3" thicknesses. For special applications, Thermobestos with extended legs can be furnished as Metal-Oa®—a factory-applied aluminum or stainless steel jacket.

**USES:** For indoor and outdoor piping and equipment, operating at temperatures to 1200F, that have either steam or electrical traced pipe lines. Especially recommended for use in the power generation and chemical and process industries

**ADVANTAGES:** Traced lines present a shape problem for insulations which are furnished in half circles; to fit both the main line and the traced line would require an oval insulation a size larger than normal. An oversize insulation does not provide a snug fit and, consequently, lacks physical strength. Extended legs provide an elliptical shape that fits both the main pipe and the traced line properly. In addition, the smaller size insulation made possible by extended legs permits substantial savings in material costs.

Thermobestos with extended legs also offers these advantages:

292520

# 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 either "Regular" or "One Piece" aluminum "snap straps." No sheet metal screws are used. The aluminum alloy jacket 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 brochure IN-169A.

292521



# METAL-ON
## Application Details

Section of Metal-On pipe insulation is held open lengthwise, wrapped onto pipe, and locked securely in place with one movement.

One piece aluminum "snap strap" containing a permanently plastic sealing compound is wrapped around joint to seal out water. This type snap strap is available up to 120 OD Metal-On and requires no additional banding.

Ordinary metal band is quickly and easily applied to hold regular snap strap tightly in place with J-M Metal-On Banding Wrench.

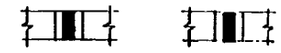
Metal-On can be made to fit elbows, tube turns, sweeps and bends by cutting mitered sections. A preformed Miter Seal aluminum band is placed over the joint and secured with a banding wrench.

The J-M Metal-On Cutter has been specially developed for easy hand cutting of aluminum jacket only.

Jacket cut is started by pressing cutter point through aluminum with heel of hand.

**COLORED SNAP STRAPS AVAILABLE FOR EASY COLOR CODING**

Colored Metal-On snap straps may be installed in place of regular straps on any Metal-On job for color coding purposes. The following colors, which are permanent and require no maintenance, are available: scarlet red, cascade blue, sunburst yellow, meadow green, ebony black, and orange orange.



## GUIDE SPECIFICATIONS

**STRAIGHT PIPING**

All piping shall be insulated with Johns-Manville Thermobestos according to recommended thicknesses. (See Thermobestos specification data in brochures IN-169A or IN-244A.)

The insulation shall be applied over clean dry pipe with all joints butted firmly together. Double layer insulation, when required, shall be applied with joints staggered, the inner layer secured with wire loops on 12-inch (maximum) centers, and outer layer spotted in the same manner as single layer construction. The Thermobestos shall be jacketed with a minimum thickness of .016-inch aluminum, of alloy No. 5005 or No. 3003. A moisture barrier shall be provided between the Thermobestos and the aluminum. The insulation and aluminum shall be secured in place by a continuous friction type joint to provide a positive weatherproof seal along the entire length of the aluminum jacket. Also, a .016-inch aluminum preformed strap of minimum width of 2 inches and containing a permanently plastic weatherproof sealant shall be centered and secured over each circumferential joint.

**FITTINGS**

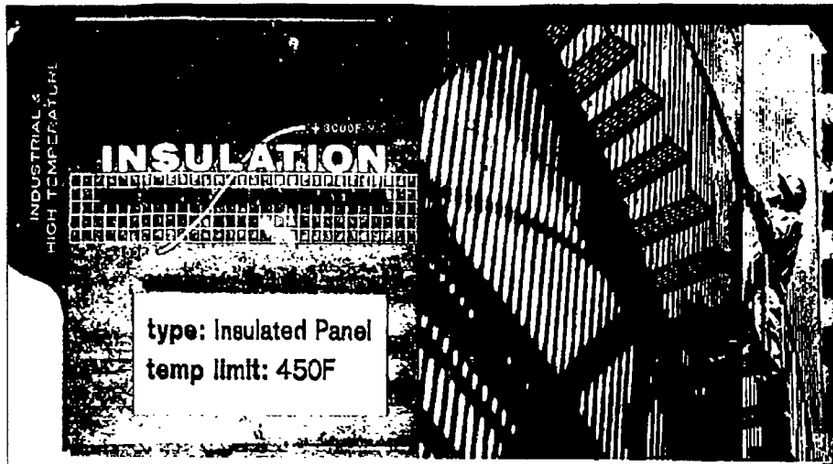
All elbows, tube turns, sweeps and bends shall be insulated with mitered sections of aluminum jacketed calcium silicate insulation (Metal-On). Joints shall be sealed with a sealing compound and preformed aluminum bands (J-M Miter Seals).

292522



*An Insulation for Every Commercial and Industrial Purpose*

JOHNS-MANVILLE JM PRODUCT




## J-M METAL-ON* tank panels

**DESCRIPTION:** J-M Metal-On tank panels combine specially formulated J-M Spintex insulation and a facing of embossed diamond rib aluminum sheet for weather protection and good appearance. Metal-On tank panels are secured to a tank by nine ¼" steel studs welded to the tank through pre-drilled holes in the panel. A specially designed nut and washer assembly closes the holes and holds the panels firmly and permanently.

**AVAILABLE FORMS:** Regularly furnished in panels covering a net area of 32 sq. ft. Aluminum facing is 100" x 50.3", Spintex is 96" x 48", by 1", 1½", 2" or 3" thick. Special ¼" threaded studs with suitable nuts are furnished with panels.

**USES:** J-M Metal-On tank panels were designed primarily for the insulation of heated tanks and vessels, but can be used for housings and other surfaces to which securement can be made by welding studs.

**ADVANTAGES:**

**Highly Efficient Insulation**

Spintex conductivity at 200F mean is below 0.32.

**Rapid Installation**

Metal-On tank panels are applied rapidly, saving labor costs and providing a really economical installation. Cut-outs for manholes, pipes, etc. are made readily.

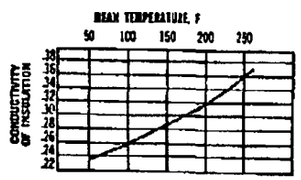
**Incombustible**

Spintex insulation rates as incombustible when tested according to Commercial Standards 131-46.

**Good Appearance**

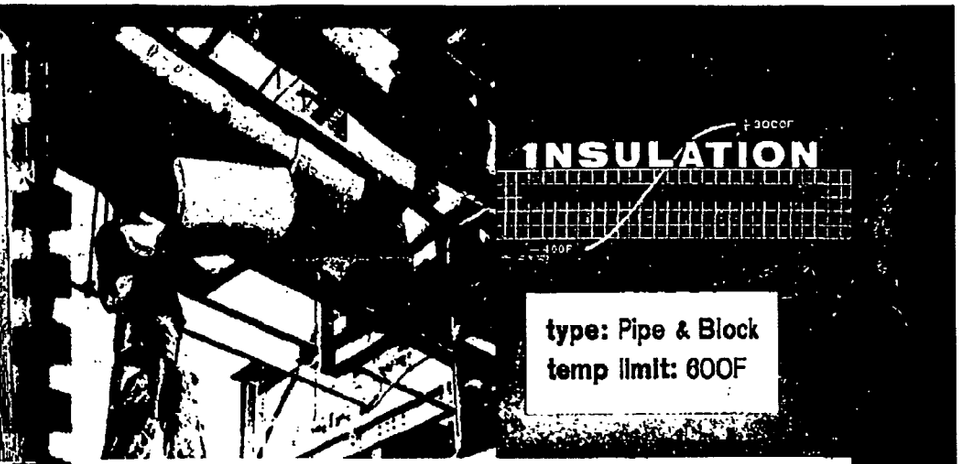
Metal-On tank panels provide long-lasting weather protection and attractive appearance under normal atmospheric conditions. Horizontal laps are 4", vertical side laps are 2¼".

**THERMAL CONDUCTIVITY**






292523




## J-M 85% MAGNESIA pipe and block insulation

**DESCRIPTION:** Johns-Manville 85% Magnesia is composed of hydrated basic carbonate of magnesia bonded with asbestos fiber and molded into both pipe and block form. The Johns-Manville manufacturing process provides the material with a maximum number of voids, or minute dead-air cells, which increases the natural resistance to heat transmission and reduces the weight of this durable insulation. Maximum mechanical strength consistent with high insulating value is an added advantage

**AVAILABLE FORMS:** J-M 85% Magnesia is furnished in both sectional pipe insulation and block form. The pipe insulation comes in a complete selection of sizes up to 14" x 2" half-sections. Larger sizes are available in segments and curved blocks. Blocks are available in widths of 3, 6, 9 and 12", and lengths of 18 and 36", in a full range of thicknesses. 6" wide curved blocks are available for larger diameters.

**USES:** Recommended for use to 600F on heated piping and equipment in schools, hotels, hospitals, public buildings, ships and industrial installations of all types. For temperatures above 600F, J-M 85% Magnesia is often used as an outer layer over J-M Superex. This construction—known as Superex Combination—combines the high heat resistance of Superex with the greater insulating value of 85% Magnesia.

**ADVANTAGES**

**Good Compressive Strength**

J-M 85% Magnesia has the compressive strength necessary to withstand all normal abuse to which exposed piping and equipment may be subjected.

**Chemically Stable**

100% inorganic, will neither burn nor rot.

**Low Maintenance**

For practical purposes J-M 85% Magnesia is ageless and will last as long as the masonry in a building.

**Withstands Wetting**

Will withstand repeated wetting and drying without deterioration.

**High Insulating Value**

Has a thermal conductivity of .46 at 600F mean temperature.

**Light Weight**

Easy to handle and install.

292521



*An Insulation for Every Commercial and Industrial Purpose*

INDUSTRIAL & HIGH TEMPERATURE

**type:** Block
**temp limit:** 1900F

## J-M SUPEREX® block insulation

**DESCRIPTION:** J-M Superex block insulation is composed of calcined diatomaceous silica blended with other insulating materials and bonded with asbestos fiber. These light weight, large size blocks will withstand temperatures up to 1900F with negligible shrinkage. Their unique combination of low conductivity and high stability at elevated temperatures provide excellent efficiency and long maintenance-free service.

Ever since its introduction, Superex has demonstrated its versatility as a high temperature insulation. Today, for example, it economically insulates 90% of this country's hot blast stoves.

**AVAILABLE FORMS:** Furnished in flat or curved blocks in the following sizes: Flat or curved, 3" or 6" wide by 18" or 36" long. Flat only, 9" or 12" wide by 18" or 36" long. Thicknesses range from 1" to 4".

**USES:** Superex blocks are widely used for equipment operating at temperatures to 1900F including boiler furnaces, hot blast stoves, mains and bustle pipes, hot gas flues, soaking pits, petroleum cracking furnaces, producer gas mains, and metallurgical furnaces of various types.

**ADVANTAGES**

**High Compressive Strength**
Compresses only ¼" (2" thickness) under a pressure of 85 lbs per square inch.

**Low Conductivity at High Temperatures**
Superex has a conductivity of .82 at 1000F mean temperature.

**Low Heat Shrinkage**
Has a linear shrinkage of only 2.7% at 1900F.

**Dimensional Uniformity**
Straight, true edges and close tolerances make possible tight joints.

**Light Weight**
Ideal for insulating movable high temperature equipment.

**Large Size Blocks**
Large 12" x 36" blocks speed application and reduce the number of joints.



292525

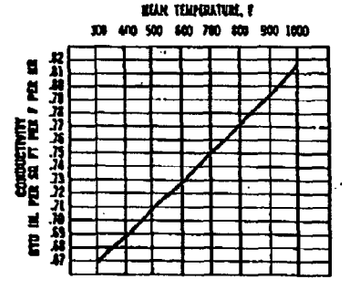
## SUPEREX
### Specification Data

**PHYSICAL PROPERTIES**

| | |
|---|---|
| Density (dry) | 24 lbs per cu ft |
| Transverse Strength (modulus of rupture) | 100 psi |
| Compressive Strength | 85 psi to produce ¼" compression in 2" thickness |
| Linear Shrinkage (after 24 hr soaking heat at 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**

AMS-I-0028219 B, Class 3 and 4

**STANDARD SIZES AND THICKNESSES**

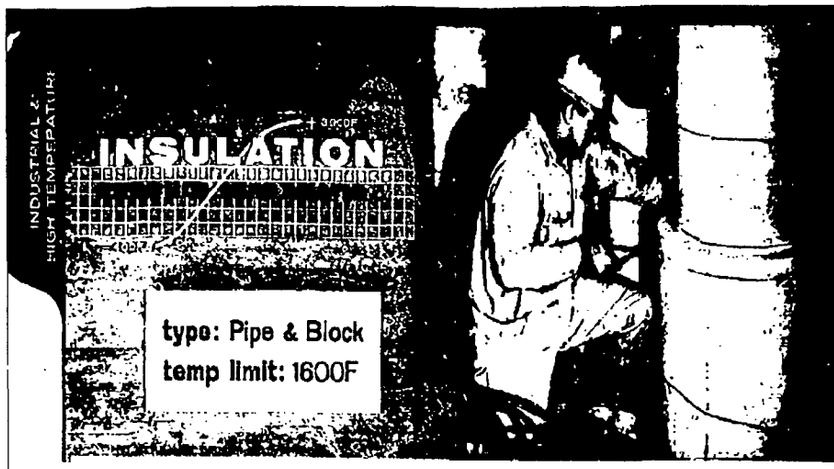
| Length, inches | Width, inches | Thickness, inches |
|---|---|---|
| 18 and 36 | 3 & 6 flat or curved<br>9 & 12 flat only | 1 through 4<br>1½ through 4 |

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

292526



*An Insulation for Every Commercial and Industrial Purpose*




# J-M SUPEREX-M® pipe and block insulation

**DESCRIPTION:** Superex-M pipe and block insulation is, like Superex, a high temperature product composed of calcined diatomaceous silica blended with other insulating materials and bonded with asbestos fiber. Recommended for use at service temperatures to 1600F, it possesses lower density and conductivity than regular Superex.

**AVAILABLE FORMS:** Superex-M is furnished in both block and pipe insulation form. The pipe insulation comes in 3 ft half sections. In thicknesses ranging from 1" to 3½", in pipe sizes up to 14". Segments furnished for pipe sizes larger than 14". Blocks come in the following sizes: Flat or curved, 3" or 6" wide by 18" or 36" long. Flat only, 9" or 12" wide by 18" or 36" long. Thicknesses range from 1" to 4".

**USES:** In addition to being used (to 1600F) for the installations listed under Superex, Superex-M is also often specified in combination with J-M 85% Magnesia or Thermobestos to give greater insulating value for a given service temperature and insulation thickness. In such cases, the Superex-M is always placed next to the hot surface in sufficient thickness to reduce the temperature on the outer layer to its safe limit.

**ADVANTAGES**

**High Compressive Strength**

Compresses only ¼" (2" thickness) under a pressure of 70 lbs per square inch.

**Low Conductivity at High Temperatures**

Superex-M has a conductivity of .74 at 1000F.

**Dimensional Uniformity**

Straight true edges and close tolerances make possible snug joints.

**Low Heat Shrinkage**

Has a linear shrinkage of only 2.0% at 1600F.

**Large Sizes**

In both block and sectional pipe insulation form, Superex-M comes in large sizes which means faster, more economical installation.



292527

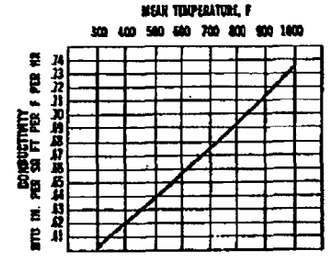
# SUPEREX-M
## Specification Data

### PHYSICAL PROPERTIES*

| | |
|---|---|
| Density (dry) | 21 lbs per cu ft |
| Transverse Strength (modulus of rupture) | 90 psi |
| Compressive Strength | 70 psi to produce ¼" compression in 2" thickness |
| Linear Shrinkage (after 24 hr soaking heat at indicated temperature) | 2.0% at 1600F |
| Maximum Service Temperature | 1600F |

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

### THERMAL CONDUCTIVITY




### COMPLIANCE WITH GOVERNMENT SPECS

**Pipe Insulation:**
MIL-I-2781 C
Grade HI, Class E, Type 2

**Block Insulation:**
MIL-I-[illegible] B
Class 2 and 3

### STANDARD SIZES AND THICKNESSES

**Pipe Insulation:**

| Length | Thickness, inches (In HI standard pipe sizes) |
|---|---|
| 3-ft sections and segments | Nominal 1 through 6" pipe size actual, 1½, 2, 2½ and 3 |

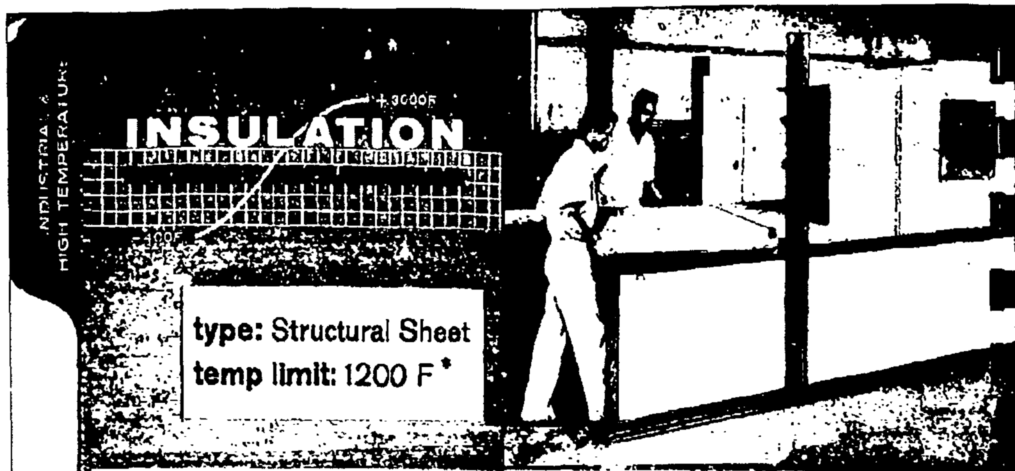
**Block Insulation:**

| Length, inches | Width, inches | Thickness, inches |
|---|---|---|
| 18 and 36 | 3 & 6 flat or curved<br>9 & 12 flat only | 1 through 4<br>1½ through 4 |

292528



*An Insulation for Every Commercial and Industrial Purpose*




**type:** Structural Sheet
**temp limit:** 1200 F *

## J-M MARINITE® structural sheet insulation

■ **DESCRIPTION:** Johns-Manville Marinite is a fireproof insulating sheet material that builds and insulates in one operation. Composed of asbestos fiber, diatomaceous silica, and an inorganic binder, it combines great structural strength with light weight, excellent thermal properties and ease of erection. Marinite is non-corroding and will not disintegrate after prolonged immersion in water.

■ **AVAILABLE FORMS:** Marinite is furnished in three densities: 23, 36 and 65 lbs per cu ft. All are supplied in two types: Type A, with a sanded finish on both sides; Type B, sanded both sides and treated with an inorganic impregnant, ready for priming and painting or veneering. Marinite sheets range in size from 36" x 96" to 48" x 120", and in thickness from ¼" to 2", depending on density. Thicknesses up to 4" are available on special order.

■ **USES:** Because it is both a structural and an insulating material, Marinite offers major economic advantages in the construction of ovens, driers, and other insulated housings for the retention and control of heat. In addition, it can be readily machined into various shapes for all types of heat applications.

*For panel applications consult J-M representative or Marinite brochure IN-153A. Service temperature will govern panel size and number of layers required.

■ **ADVANTAGES**

**Structural and Insulating Material**

Builds and insulates in one operation.

**Fireproof**

Will not burn. Every sheet of Marinite carries the Underwriters' Laboratories, Inc., label with the following Fire Hazard Classification (based on 100 for untreated Red Oak):

| | |
|---|---|
| Flame Spread | 0 |
| Fuel Contributed | Negligible |
| Smoke Developed | 0 |

**Easy to Erect**

Large, easy-to-handle sheets can be installed as quickly and easily as plywood.

**Requires No Maintenance**

Completely inorganic and not affected by moisture, will not rust, rot or corrode . . . lasts indefinitely.



292529

# MARINITE
## Specification Data

292530

| | | Marinite-23 | Marinite-36 | Marinite-65 |
|---|---|---|---|---|
| Density (Dry), lbs/cu ft | | 23 | 36 | 65 |
| Moisture Content (Normal), % of dry weight | | 5 | 5 | 5 |
| Transverse Strength (Dry), psi (Modulus of Rupture) | | 550 | 1000 | 1500 |
| Modulus of Elasticity (Dry), psi (From Transverse Test) | | 0.20 x 10⁶ | 0.38 x 10⁶ | 0.65 x 10⁶ |
| Consolidation (Normal), in./in. | Load, psi 500 | 0.02 | 0.02 | 0.01 |
| | 4000 | 0.62 | 0.38 | 0.18 |
| | 8000 | — | — | 0.31 |
| | 12000 | — | — | 0.39 |
| Compressive Strength (Normal), psi (1" thickness) | | 14000 | 14000 | 16000 |
| Tensile Strength (Normal), psi | | 380 | 420 | 750 |
| Shear Strength (Normal), psi | | | | |
| Normal to face of sheet | | 320 | 700 | 1540 |
| Parallel to face of sheet | | 200 | 320 | 510 |
| Charpy Impact Resistance (Normal), inch-lb (ASTM D256, Method B-4" span, 5" x ½" x ½" unnotched samples) | | 1.4 | 1.6 | 3.4 |
| Brinell Hardness No. (Dry) | | | | |
| 10 kg load, 10 mm ball, 10 sec | | 0.5 | — | — |
| 50 kg load, 10 mm ball, 10 sec | | — | 1.8 | 4.6 |
| Screw Holding Strength (Normal), lb/screw (Withdrawal) load for Type A, No. 8-12 Sheet-Metal Screws) | | | | |
| ½" penetration | | 35 | 80 | 180 |
| 1½" 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 (Avg over temperature range indicated. Detailed information for special cases furnished on request.) | | $2.3 \times 10^{-4}$ (up to 200F; shrinkage thereafter) | $1.3 \times 10^{-4}$ (up to 250F; shrinkage thereafter) | $2.9 \times 10^{-4}$ (up to 250F; shrinkage thereafter) |
| Maximum Service Temperature, F (For Continuous Service) — See footnote at bottom of preceding page. | | 1200 | 1200 | 1200 |
| Fire Hazard Classification (Listed under Underwriters' Laboratories, Inc. Label Service Guide, No. 40 U8.13) | | Flame Spread 0, Smoke Developed 0, 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.

### DIMENSIONAL TOLERANCES

| Material | Length & Width, inches | Thickness, inches | Squareness, max. dev. per linear ft, inches |
|---|---|---|---|
| Marinite-23 | ±[illegible] | ±[illegible] | ±[illegible] |
| Marinite-36 | ±[illegible] | ±[illegible] | ±[illegible] |
| Marinite-65 | ±[illegible] | ±[illegible] | ±[illegible] |

### THERMAL CONDUCTIVITY

| | Mean Temperature, F 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|---|---|---|---|---|---|---|---|---|---|---|
| Marinite-23 | 0.57 | 0.58 | 0.59 | 0.60 | 0.61 | 0.62 | 0.63 | 0.65 | 0.66 | 0.67 |
| Marinite-36 | 0.76 | 0.77 | 0.78 | 0.79 | 0.80 | 0.81 | 0.82 | 0.84 | 0.85 | 0.86 |
| Marinite-65 | 1.7 | — | — | — | — | — | — | — | — | — |

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

### STANDARD SIZES AND THICKNESSES

| Material | Thicknesses, inches | 3x8 | 3½x8 | 4x8 | 4x10 |
|---|---|---|---|---|---|
| Marinite-23 | 1 | V | V | V | V |
| | 1½ | V | V | V | |
| | 2 | | | V | |
| Marinite-36 | ½, ¾, ⅞, 1 | V | V | V | V |
| | *1½, *2, *4 | | | V | |
| Marinite-65 | ¼, ⅜ | V | V | V | V |
| | ¾, ⅞, 1 | V | V | V | *V |
| | 1½, 2 | | | V | |

*Subject to 8 to 10 weeks delivery.

### SPECIFIC HEAT

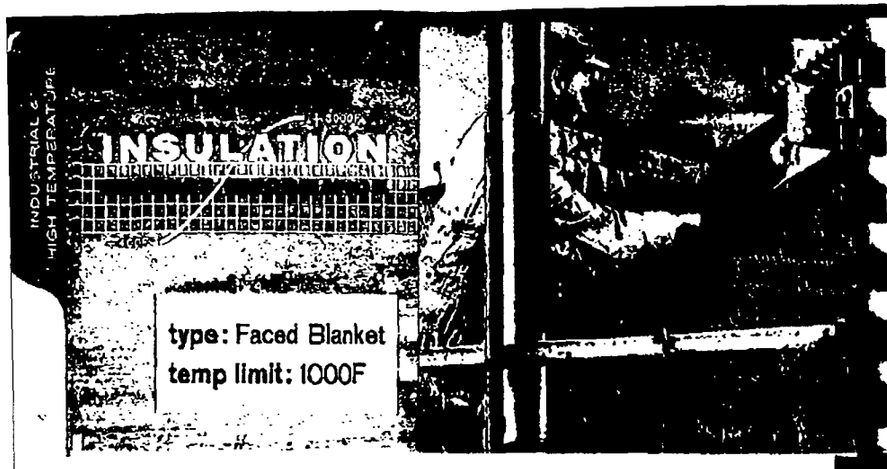
| | Temperature, F 200 | 400 | 600 | 800 |
|---|---|---|---|---|
| Marinite-23, Marinite-36, Marinite-65 | 0.25 | 0.28 | 0.31 | 0.34 |

SPECIFIC HEAT: BTU PER F PER LB



An Insulation for Every Commercial and Industrial Purpose

JOHNS-MANVILLE JM PRODUCTS




## J-M BANROC® BLANKETS mineral fiber insulation

**DESCRIPTION:** A felted, spun mineral fiber blanket secured between outer facings of metal fabric. Facing varies depending upon service requirements. The density and thickness of the blanket are carefully controlled to assure full insulating value. The density of the felt in the standard blanket is 8 lbs per cubic foot.

### AVAILABLE FORMS

Banroc Blanket Filler—without metal lath or mesh.

No. 102—1" galvanized wire mesh on both sides.

No. 112—Copper-bearing metal lath (also known as burial-vault mesh) one side, 1" galvanized wire mesh other side. Copper-bearing metal lath weighs approximately 2.5 lbs per sq yd with ¾" x ¾" between diamond centers. Diamond mesh lath (which can be substituted when copper-bearing metal lath is not available) weighs approximately 2.5 lbs per sq yd with ¾" x ¾" between diamond centers.

No. 122—Copper-bearing metal lath on both sides.

No. 132—⅜" rib lath one side, and 1" galvanized wire mesh other side. Rib lath weighs approximately 3.0 lbs per sq yd.

No. 132-A—Same as No. 132 except ribs are turned out to provide an air space, desired in some applications.

No. 142—⅜" rib lath one side, and copper-bearing metal lath other side.

No. 142-A—Same as No. 142 except ribs are turned out to provide an air space, desired in some applications.

Plain Banroc Blanket-Filler is also available without facings.

NOTE: Under each style number, the first metal fabric listed is the side on which wire staples are hooked. When the twisted ends are required on the reverse side, it must be so specified.

**USES:** Where the convenience of a flexible insulation, plus excellent thermal efficiency, is desired, J-M Banroc Blankets offer the highest quality mineral fiber product available today. This insulation is used for industrial baking ovens, dryers, ducts and breechings, and similar equipment. Banroc Blankets are adaptable to flat or curved surfaces and do not break in handling. They are easily cut on the job to fit around obstructions and irregular equipment, and may be used under normal conditions for temperatures to 1000F.



292531

### 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

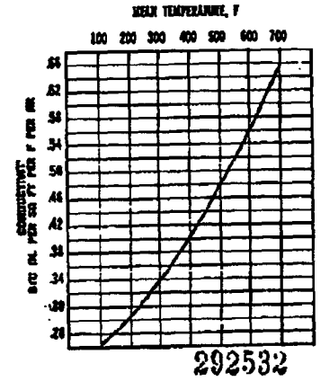
HH-I-553, Amendment 1—Type 1, Class A & B
MIL-I-2516 A

### STANDARD SIZES* AND THICKNESSES

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

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

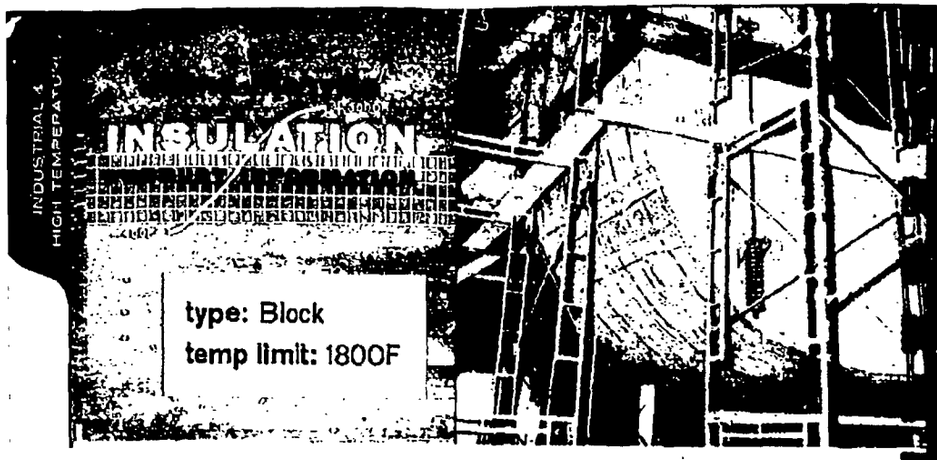
### THERMAL CONDUCTIVITY




292532



*An Insulation for Every Commercial and Industrial Purpose*




## 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 spun mineral wool fibers bonded with a clay binder.

**AVAILABLE FORMS:** Furnished in block form only in thicknesses from ½" to 4"; lengths up to 36"; widths to 24".

**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, 24" x 36", cut installation costs.

**Fireproof**

Made from mineral fibers which will not burn.

**Low Conductivity**

H.T. Banroc has a K factor of .625 at 800F.

### PHYSICAL PROPERTIES*

| | |
|---|---|
| Density (dry) | 18 lbs per cu ft |
| Transverse Strength (modulus of rupture) | 40 psi |
| Linear Shrinkage (after heating at 1800F) | less than 4% |

*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, 24, and 36 | 6, 12, 18, and 24 | ½ to 4 (½ inch increments) |

### COMPLIANCE WITH SPECIFICATIONS

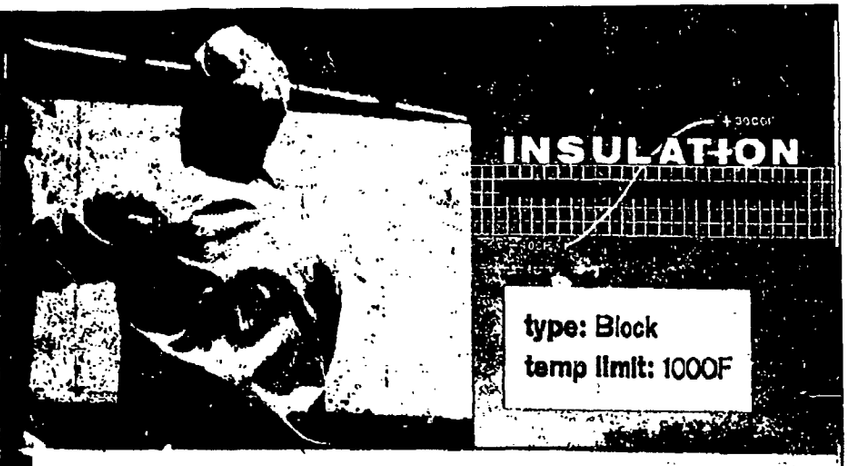
Federal Specification HH-I-564, Form I, Types A, B, C, D
Commercial Standards CS-117, Block, Classes A, C, D
A C 392
U S Coast Guard, Structural Insulation, 2", 164 007/23/0

### THERMAL CONDUCTIVITY

| | MEAN TEMPERATURE, F | | | | | |
|---|---|---|---|---|---|---|
| CONDUCTIVITY BTU IN. PER SQ FT PER F PER HR | 200 | 400 | 600 | 800 | 1000 | 1200 |
| | .360 | .420 | .510 | .625 | .755 | .900 |



292533




## J-M BANROC® M BLOCK

### mineral fiber insulation

**DESCRIPTION:** A block type insulation made from felted, high temperature resistant spun mineral fibers with binder added. Banroc M Block has a density of 8 lbs. per cubic foot which is carefully controlled during manufacture to assure full insulating effectiveness and superior handling characteristics.

**AVAILABLE FORMS:** Furnished in block form only in thicknesses from 1½" to 4" (can be made up to 8" by applying additional layers); widths of 18" or 24"; length 30".

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

*Special Note: Banroc M Block can only be used when held in place with metal sheet, lath or mesh.*

**COMPLIANCE WITH GOVERNMENT SPECS**

HH-I-563 Type II Class D

HH-I-564 Form I Class A, B, & C

ASTM Spec. C-392

**ADVANTAGES**

**Easy Application**

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

**Large Sheet Size**

Large size sheet—18" or 24" wide, 30" long—cut installation costs.

**Fireproof**

Made from mineral fibers which will not burn.

**Low Conductivity**

Banroc M Block has a K factor of .48 at 500F mean.

**Corrosion Resistant**

Tested in accordance with U.S. Maritime Commission specification 32-MC-1, Banroc M Block placed in physical contact with a polished steel plate exposed to alternate wetting and drying cycles causes no more corrosion than sterile cotton under similar test conditions.

**Moisture Resistant**

Mineral fibers are solid filaments, non-absorptive in themselves and treated to prevent hygroscopic or capillary action of the insulation.

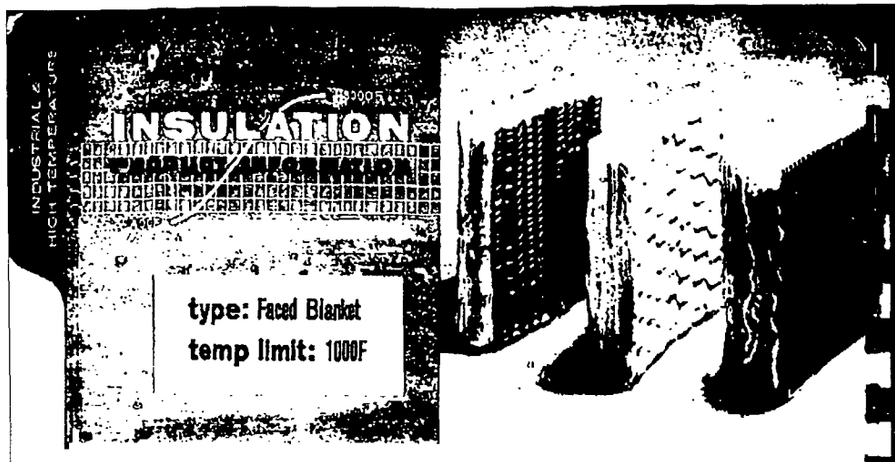
### THERMAL CONDUCTIVITY

| CONDUCTIVITY BTU IN. PER SQ FT PER F PER HR | MEAN TEMPERATURE F | | | | | |
|---|---|---|---|---|---|---|
| | 200 | 300 | 400 | 500 | 600 | 700 |
| | .29 | .34 | .40 | .48 | .56 | .65 |



*An Insulation for Every Commercial and Industrial Purpose*

292534




## J-M UNBONDED B-FIBER blankets

**DESCRIPTION:** A felted, white, blanket of flame-blown glass fibers secured between outer facings of metal mesh. The felt contains no binder, oil, or other organic material and is non-resilient. The basic glass is an essentially non-corrosive borosilicate with good chemical and water durability. The boron content is 11% $B_2O_3$ by weight. The density of the felt is approximately 4½ lbs. per cubic foot.

**AVAILABLE FORMS:** Furnished with the following metal outer facings fastened to each other with twisted wire staples:

1. 1" galvanized wire mesh on both sides
2. Copper-bearing metal lath one side, 1" galvanized wire mesh other side
3. Copper-bearing metal lath on both sides
4. ⅜" rib lath one side and 1" galvanized wire mesh other side
5. Same as 4 above except ribs turned out to provide air space
6. ⅜" rib lath one side and copper bearing metal lath other side
7. Same as 6 above except ribs are turned out to provide air space

**USES:** J-M Unbonded B-Fiber Blankets are ideal for applications that call for a flexible, completely inorganic and clean insulation. They are recommended for use in nuclear power plants and on low-temperature equipment.

**ADVANTAGES:**

**Easily Applied**

J-M Unbonded B-Fiber Blankets are adaptable to flat or curved surfaces and are readily cut with ordinary tools on the job site; obstructions or irregular shapes pose no problems.

**Heat and Radiation Resistant**

Innumerable air spaces created by the fine glass fibers effectively restrict the transfer of heat. J-M Unbonded B-Fiber Blankets will not break down under exposure to radiation.

**Durable**

Completely inorganic, J-M Unbonded B-Fiber Blankets are tough and will not pull apart during normal handling and fabrication.

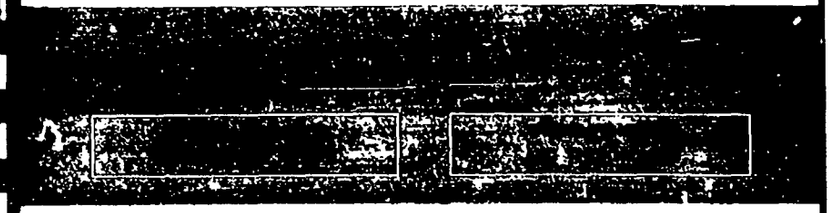
**Flame and Moisture Resistant**

Glass fibers are incombustible and moisture resistant; they don't shrink, swell or rot and resist the effect of oil, grease and most acids.



292535

## UNBONDED B-FIBER BLANKETS
### Specification Data



Complies with Federal Spec HH-I-565 Type 1 Class B.

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

*All thicknesses consist of 6 plies of felt per inch.

**THERMAL CONDUCTIVITY:** BTU IN. PER SQ. FT PER F [illegible]

| MEAN TEMPERATURE, F | CONDUCTIVITY |
|---|---|
| 100 | .23 |
| 200 | .27 |
| 300 | .32 |
| 400 | .37 |
| 500 | .43 |
| 600 | .51 |
| 700 | .60 |
| 800 | .71 |

292536



*An Insulation for Every Commercial and Industrial Purpose*

## J-M METAL-K* pipe and blanket insulation

**DESCRIPTION:** Metal-K is an all-metallic reflective type insulation, consisting of inner reflective foils (either aluminum, stainless steel, Inconel or other metals as required) spaced from ⅛" to ¼" apart by ⅜" wide corrugated metal strips fastened to the foils. These strips are spaced on approximately 6" centers and are staggered between layers to minimize through metal conduction. A stainless steel outside cover sheet provides mechanical strength and a lower surface temperature. Other constructions are available to meet specific requirements. Metal-K is light in weight and thermally efficient.

**AVAILABLE FORMS:** Metal-K insulation is factory engineered and fabricated for each individual job. It is furnished in special shapes to accurately fit all flat and curved surfaces including piping, fittings and flanges. Pipe insulation can be furnished in two foot long, flat, wrap-around blankets or in formed full or half sectional pieces. Usual blanket size for flat or curved surfaces is 24" x 36". Edges are grooved to reduce convection and radiation losses at the joints. Johns-Manville furnishes clips and bands to facilitate installation.

**USES:** Metal-K is used to protect nuclear reactor systems against contamination. In addition to insulating the reactor vessel, Metal-K is installed as both an internal and external insulation for piping and equipment. It is also suitable for other applications where utmost cleanliness and resistance to gas erosion or chemical attack is important.

**ADVANTAGES**

**Thermally Efficient**

Metal-K has a low thermal conductance and provides permanent resistance to heat flow.

**Eliminates System Contamination**

All materials become radioactive when exposed to neutron flux in the vicinity of a reactor. Metal-K contains no fibrous or particulate matter associated with conventional materials. Therefore, the possibility of system contamination by activated material is eliminated.

**Non-Absorptive**

The all metallic components of Metal-K will not absorb radioactive material in the event of a leak or a spill during refueling.

**Cleanable**

Metal-K may be submerged in water and exposed to cleaning solutions used for decontamination. Its smooth, bright surfaces are readily cleanable.

**Non-Corrosive**

Metal-K eliminates all possibility of stress corrosion of austenitic stainless steel from trace amounts of chloride present in conventional insulating materials.

**Internal Insulation**

Metal-K can be used inside equipment and piping carrying gases such as gas cooled reactors.

**Easily Installed**

Metal-K is precision engineered and fabricated for each individual job and accurately fits all surfaces.

292537



## METAL-K
### Thermal Conductance Data*

**1** Eleven 3 mil thick No. 304 stainless steel foils and two 9 mil thick No. 304 stainless steel cover sheets, all spaced ¼" apart (12—¼" air spaces; total thickness of blanket—3")

| | |
|---|---|
| Temperature, F hot face | 910 |
| Temperature, F cold face | 102 |
| Mean Temperature, F | 405 |
| Thermal Conductance (BTU PER SQ FT PER F PER HR) | 0.104 |

**2** Three 1½ mil thick No. 304 stainless steel foils and two 4 mil thick No. 304 stainless steel cover sheets, all spaced ¼" apart (4—¼" air spaces; total thickness of blanket—1")

| | | | |
|---|---|---|---|
| Temperature, F hot face | 449 | 1042 | 1233 |
| Temperature, F cold face | 282 | 827 | 817 |
| Mean Temperature, F | 335 | 934 | 1025 |
| Thermal Conductance (BTU PER SQ FT PER F PER HR) | 0.82 | 1.18 | 1.83 |

**3** Fourteen 3 mil thick No. 304 stainless steel foils and two 9 mil thick No. 304 stainless steel cover sheets all spaced ¼" apart, plus a ¼" high spacer strip on exposed surface of inside cover sheet (16—¼" air spaces; total thickness of blanket—2")

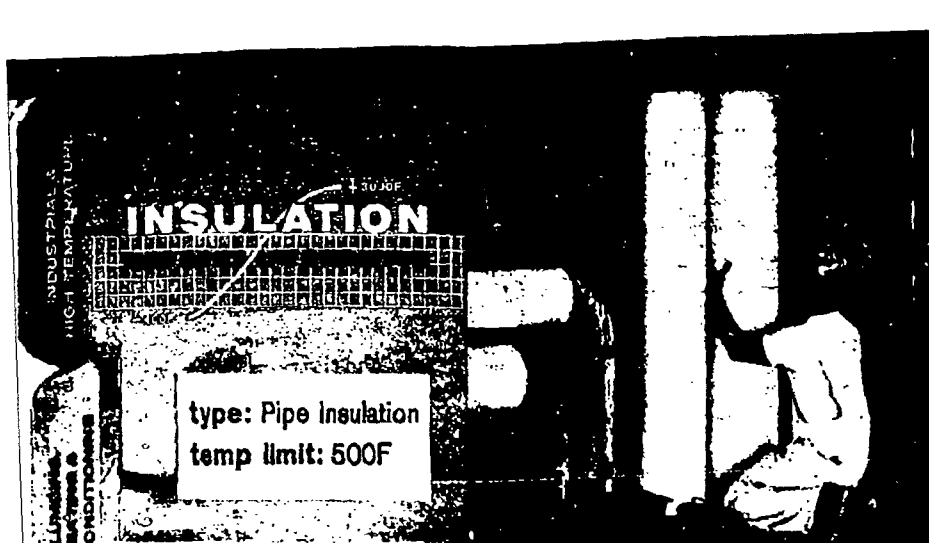
| | |
|---|---|
| Temperature, F hot face | 710 |
| Temperature, F cold face | 104 |
| Mean Temperature, F | 452 |
| Thermal Conductance (BTU PER SQ FT PER F PER HR) | 0.267 |

*Thermal conductance of a reflect'v type insulation such as Metal-K depend: upon the specific construction and orientation of the product including the spacing and emissivity of the foils. The thermal conductances shown, as determined by actual tests, are typical for the indicated temperature conditions and blanket configurations, in air at atmospheric pressure. Values will change with other gases and/or pressures.

292538



*An Insulation for Every Commercial and Industrial Purpose*




# J-M MICRO-LOK fiber glass pipe insulation

**DESCRIPTION:** J-M Micro-Lok is a lightweight pipe insulation made of long, fine flame blown glass fibers bonded together with a thermosetting resin. Countless air spaces created by these fine fibers are particularly effective in resisting the passage of heat. The three-foot sections of insulation are molded in one piece, then cut longitudinally through one wall and partially through the other. This produces a "hinged" section that opens uniformly, and with only slight effort, over the entire length. Because of the resiliency of the fibers, it closes automatically and firmly. The manufacturing process permits accurate control of dimensions. Thus, the inside diameters, wall thicknesses and outside diameters are always uniform. The outside surface is smooth and firm to give the sections a well-tailored appearance.

**AVAILABLE FORMS:** J-M Micro-Lok is made in 3' sections for IPS ½" to 30" depending on thickness, and copper tube sizes from ⅜" to 12⅛". (A special metal-jacketed Micro-Lok—known as Metal-Lok—is also available. See page 26.)

**USES:** J-M Micro-Lok, with jackets as required, is designed for use on hot, cold and chilled water lines; brine, refrigerant and special process lines; dual temperature, steam and other hot lines to 500F.

## ADVANTAGES

**Saves Fuel & Power**

Low k factor of .225 at 75F mean permits more efficient temperature control. Snug closure guards against heat loss or gain at joints.

**Economical to Apply**

Light weight and one-piece construction with "spring hinge" full-length opening and automatic closing features speeds on-the-job handling. Easy to cut and fit accurately. Because of lightness, only two carton sizes are required to handle all sizes and thicknesses of Micro-Lok.

**Resilient & Durable**

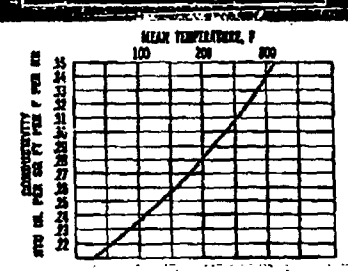
Resiliency of glass fibers absorbs mechanical abuse during shipment and application; prevents breaking and crumbling of edges; saves waste, makes tighter joints; saves patching costs. Glass fibers are incombustible, won't shrink, swell or rot, and will not attract rodents or vermin.





# MICRO-LOK Specification Data

| | |
|---|---|
| Moisture Absorption | less than 0.2% by vol |
| Alkalinity | less than 2% expressed as $Na_2O$ |
| Chemistry (with steel, copper, aluminum) | does not cause air oxidization |




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

## JACKETING* INFORMATION

**Covers**- standard, 4 oz., 6 oz., and 8 oz. are available on all sizes and thicknesses from ½" IPS to 30" IPS. Bands are available at an additional charge.

**Vapor Barriers**

GP: an all-around general purpose jacket for usage at temperature range of 50F to 250F, and available only on ⅜" and ½" thickness. This jacket consists of a heavy weight white kraft laminated to a vapor barrier of aluminum foil.

WX: a 3-ply laminate of white 60 lb. kraft, 0.001" aluminum foil, and 55 lb. asphalt-saturated kraft. Perm rating: .02 perms.

FB Flame-Bar: a fire-resistant vapor barrier jacket consisting of a white bleached 25 lb. kraft bonded to aluminum foil with a fire-resistant adhesive, reinforced with J-M glass fibers. Perm rating: .02 perms.

**Weather Proofing**

WP: Roofing felt 25 lb., 45 lb., 55 lb.

*All jackets have a minimum 1½" longitudinal lap. Covers jackets also have a minimum 3½" circumferential lap. All other jackets are sealed circumferentially with a 4" wide strip of the jacketing material, factory supplied.

**COMPLIANCE WITH GOVERNMENT SPECS**

HH-I-552 Type I, Class A and B
MIL-I-22344

## GUIDE TO SPECIFICATIONS FOR APPLICATION AND FINISHING

| Service & Temperature | Location | Jacket Material |
|---|---|---|
| Hot Water 250F* | Exposed or Concealed | Covers or GP |
| | Outdoor | WP or Metal-Lok |
| Cold Water 50F | Exposed or Concealed | GP, WX or FB |
| | Outdoor | WP or Metal-Lok |
| Chilled Water, Brine, Refrigerants and Special Processes | Exposed or Concealed | WX or FB |
| Dual Temp 212F to 35F* | Outdoor | WX or FB plus WP or .030 Aluminum |
| Hot Water, 500F Steam | Exposed or Concealed | Covers |
| | Outdoor | WP or Metal-Lok |

*Services below 35F require special consideration regarding vapor sealing. For such applications call or write the nearest J-M sales office.



*An Insulation for Every Commercial and Industrial Purpose*

INDUSTRIAL & HIGH TEMPERATURE

PLUMBING, HEATING & AIR CONDITIONING

# MICRO-LOK®
## Specification Data

### RECOMMENDED THICKNESSES

#### HEATED PIPING INSULATION

| Nominal Pipe Size (Inches) | Temperature of Pipe, F: Commercial—Full Year Operation 100 to 199 | 200 to 299 | 300 to 399 | 400 to 499 | Commercial—Seasonal Operation 100 to 199 | 200 to 299 | 300 to 399 | 400 to 499 |
|---|---|---|---|---|---|---|---|---|
| | Nominal Thickness, Inches | | | | | | | |
| 1½ & less | | | | | | | | |
| 1½ | 1 | 1½ | 1½ | 2 | ¾ | 1 | 1 | 1½ |
| 2 | 1 | 1½ | 2 | 2 | ¾ | 1 | 1½ | 1½ |
| 2½ | 1 | 1½ | 2 | 2½ | 1 | 1 | 1½ | 2 |
| 3 | 1 | 1½ | 2 | 2½ | 1 | 1 | 1½ | 2 |
| 3½ | 1 | 1½ | 2 | 2½ | 1 | 1 | 1½ | 2 |
| 4 | 1 | 1½ | 2 | 2½ | 1 | 1½ | 1½ | 2 |
| 6 | 1½ | 2 | 2½ | 3 | 1 | 1½ | 2 | 2½ |
| 8 | 1½ | 2 | 2½ | 3 | 1 | 1½ | 2 | 2½ |
| 10 | 1½ | 2 | 2½ | 3 | 1 | 1½ | 2 | 2½ |
| 12 | 1½ | 2 | 3 | 3½ | 1 | 1½ | 2 | 2½ |
| 14 | 1½ | 2½ | 3 | 3½ | 1½ | 2 | 2 | 2½ |

NOTE: Tabulated thicknesses are optimum thicknesses calculated on an economic* basis for heat conservation under average operating conditions and ensure adequate temperature control. Other conditions may warrant the use of other thicknesses.

*From "How to Determine Economic Thickness of Insulation" - National Insulation Manufacturers Association

#### COLD PIPING INSULATION

| Pipe Temperature, F | Ambient Condition No. 1* Pipe Size (Inches) | Thickness* (Inches) | Ambient Condition No. 2* Pipe Size (Inches) | Thickness* (Inches) |
|---|---|---|---|---|
| 0-34 | Up to 1 | 2 | Up to ¾ | 1 |
| | 1¼ to 4 | 2½ | 1 to 14 | 1½ |
| | 5 to 14 | 3 | | |
| 35-49 | Up to 2 | 1½ | Up to 2 | ¾ |
| | 2½ to 14 | 2 | 2½ to 14 | 1 |
| 50-70 | Up to ¾ | 1 | Up to 1 | ½ |
| | 1 to 14 | 1½ | 1¼ to 14 | ¾ |

*Thicknesses are calculated to prevent condensation at
Ambient Condition No. 1 - 90F dry bulb, 90%, RH
Ambient Condition No. 2 - 90F dry bulb, 80%, RH

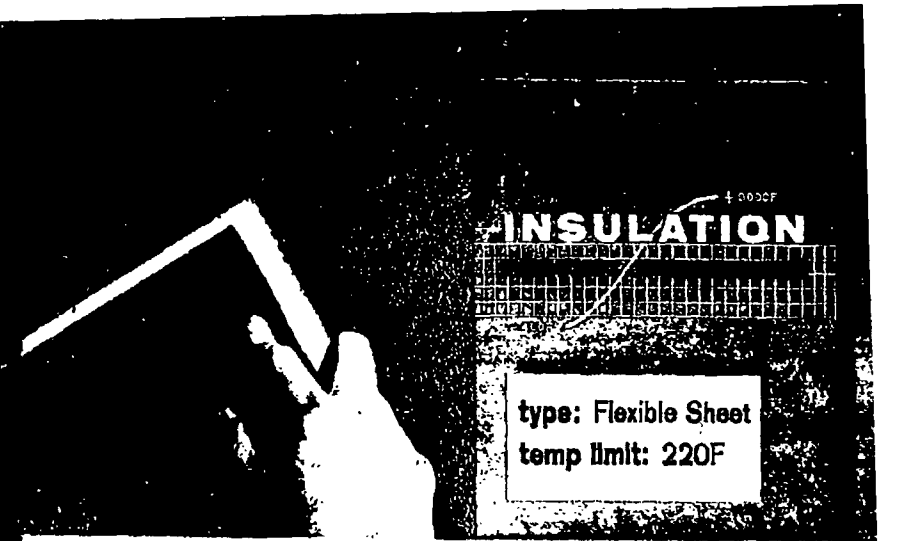
## J-M METAL-LOK

**DESCRIPTION:** J-M Metal-Lok has all the features of Micro-Lok plus a factory applied .016 smooth aluminum jacket. The longitudinal seam closure has an exclusive "Z" joint construction and circumferential butt joints are weatherproofed with a factory supplied "snap-strap." These "snap-straps" have a high penetration J-M Albaseal sealing compound to insure weather-tightness.

**AVAILABLE SIZES:** Metal-Lok is available where pipe and insulation O.D. is greater than 2.75 but less than 28" O.D. The jacket alone can be supplied for any sizes where the O.D. is greater than 38".

**RECOMMENDED USE:** Metal-Lok is recommended for hot piping up to 500F.

292541




## J-M AEROTUBE® plastic sheet insulation

**DESCRIPTION:** Johns-Manville Aerotube sheet insulation is a closed cell, foamed plastic sheet material for use on dual-temperature systems at temperatures up to 220F. Because of its flexibility it can be readily applied to irregular shapes and sizes.

**AVAILABLE FORMS:** Regularly furnished in 36" x 48" sheets in thicknesses ranging (in ⅛" increments) from ⅛" to 1".

**USES:** Designed specifically for use on dual-temperature systems. Recommended for tanks, ducts, and for pipe sizes greater than 4", particularly where sweating or condensation is a problem.

**ADVANTAGES:**

**Built-in Vapor Barrier**

Closed cell structure stops passage of moisture.

**Flexible & Easy to Apply**

Permits economical application to irregular surfaces.

### TECHNICAL PROPERTIES*

| | |
|---|---|
| Density, lbs/cu ft (avg.) | 7 |
| Temperature Limits, F: | |
| Upper** | 220 |
| Lower*** | −180 |
| Stress Resistance | good |
| Odor | negligible |
| Water Vapor Transmission, perm-in. | less than 0.1 |
| Water Absorption, % by volume | |
| After 28 days' immersion | 1.7 |
| ASTM D1056-59T | 1 max. |
| Fire Rating | self-extinguishing |

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

**Aerotube sheets secured on a pipe by wrapping around and cementing edges with adhesive 220F. If applied to metal with full area coverage of adhesive, should not be used on surfaces over 140F.

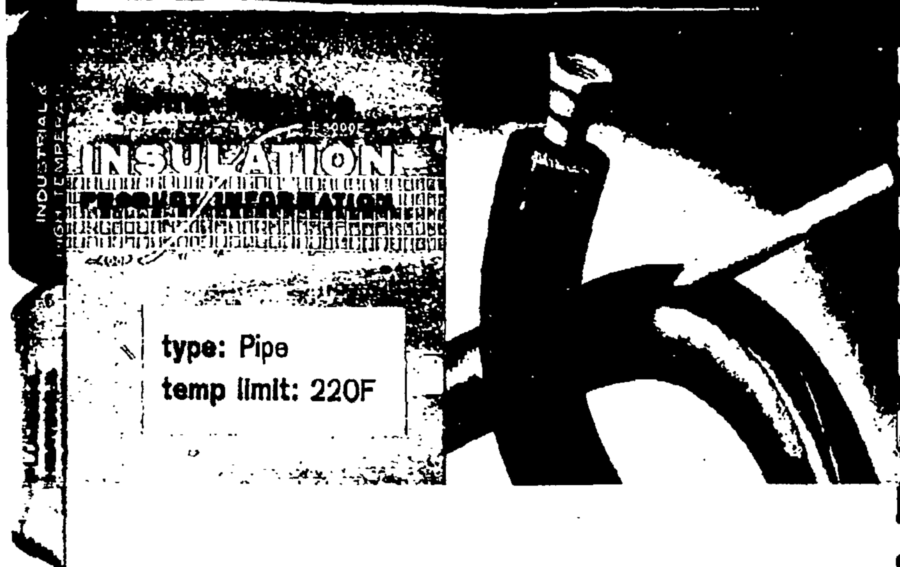
***At −297 Aerotube will be hard and at lower temperatures will become progressively brittle. This will not impair the low conductivity and good resistance to water vapor.

### COMPLIANCE WITH GOVERNMENT SPECS

Aerotube sheets comply with the requirements of MIL-P-162900, Type II, Form 2.

292542 27

*An Insulation for Every Commercial and Industrial Purpose*




# J-M AEROTUBE® plastic pipe insulation

■ **DESCRIPTION:** Johns-Manville Aerotube is a closed cell, foamed plastic, tubular pipe insulation for use at temperatures up to 220F. Its extreme flexibility permits quick, easy application, especially on bent tubing and fittings. Aerotube is clean, odorless and durable, does not carry flame, and is self-extinguishing.

Aerotube's closed cell structure stops the passage of air and water vapor. It has a water vapor transmission rating of less than 0.1 perm.

■ **AVAILABLE FORMS:** Furnished in 6' lengths without longitudinal joints for both iron pipe and copper tubing. Also available in sheet form for flat surfaces (see preceding page), and as rigid pipe insulation.

■ **USES:** Recommended for use on virtually all types of lines in heating, plumbing and air-conditioning service, particularly where sweating or condensation is a problem.

Since Aerotube is supplied in tubular form, it may be slipped over pipe or tubing before pipe connections are made. This results in substantial labor savings. Where connections have already been made, Aerotube is easily slit longitudinally with a sharp knife and snapped onto the pipe. Does not require a separate vapor barrier.

■ **ADVANTAGES:**

**Built-In Vapor Barrier**

Closed cell structure stops the passage of moisture. No separate vapor barrier necessary.

**Ozone Resistant**

Because Aerotube is ozone resistant it can be used on sharp bends and elbows without cracking at the point of stress.

**Substantial Labor Savings**

Tubular form without longitudinal joint speeds application.

**Long Lasting**

Tough foamed plastic won't rot or deteriorate ... retains its high insulating efficiency indefinitely.



292543

# AEROTUBE®
## Specification Data

| | |
|---|---|
| Density, lb/cu ft (avg.) | 7 |
| Temperature Limits, F: | |
| Upper** | 220 |
| Lower*** | –100 |
| Thermal Stability, % shrinkage | |
| 28 days at 155F | less than 1.5 |
| 28 days at 200F | less than 3.0 |
| 28 days at 220F | less than 5.0 |
| Water Vapor Transmission, perm-in. | less than 0.1 |
| Water Absorption, % by volume | |
| 28 days' immersion | 1.7 |
| ASTM D1056-56T | 1.0 max |
| Air Transmission, cu ft/hr sq ft/in., 10" water | less than 0.06 |
| Ozone Resistance | good |
| Odor | negligible |
| Fire Rating | self-extinguishing |

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

**Aerotube pipe insulation will withstand pipe temperatures up to 220F. Aerotube sheet insulation secured to a pipe or cylinder only by cementing together the edges may be used on surfaces up to 220F. Where adhered with full adhesive coverage the limit is 180F.

***Below –20F flexible Aerotube will be hard and tend to become brittle. This characteristic does not impair the low conductivity nor the resistance to water vapor.

### COMPLIANCE WITH GOVERNMENT SPECS

Aerotube pipe insulation complies with specification MIL-P-15280D Type II, Form I

### RECOMMENDED THICKNESSES

NORMAL DESIGN CONDITIONS*

| Pipe Size, in. | Thickness (inches) at Pipe Temperature 50F | 32F | 0F |
|---|---|---|---|
| ⅜ OD through 3 IPS | Nom. [illegible] | Nom. [illegible] | Nom. [illegible] |
| Over 3 IPS through 5 IPS | Nom. [illegible] | Nom. [illegible] | Nom. [illegible] |
| Over 5 IPS | [illegible] sheet | [illegible] sheet | 1 sheet |

MILD DESIGN CONDITIONS**

| Pipe Size, in. | 50F | 32F | 0F |
|---|---|---|---|
| ⅜ OD through 3 IPS | Nom. [illegible] | Nom. [illegible] | Nom. [illegible] |
| Over 3 IPS through 5 IPS | Nom. [illegible] | Nom. [illegible] | Nom. [illegible] |
| Over 5 IPS | [illegible] sheet | [illegible] sheet | ½ sheet |

SEVERE DESIGN CONDITIONS***

| Pipe Size, in. | 50F | 32F | 0F |
|---|---|---|---|
| ⅜ OD through 6 IPS | Nom. [illegible] | Nom. [illegible] | – |
| Over 6 IPS | 1 sheet | 1½ sheet | – |

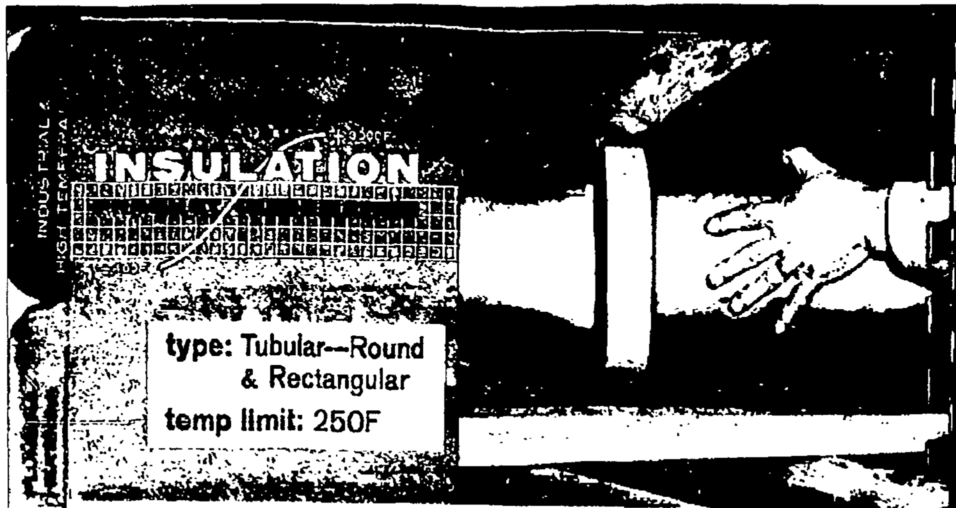
*Normal Design Conditions: max. temp. 85F, rel. hum. 70%
**Mild Design Conditions: max. temp. 80F, rel. hum. 60%
***Severe Design Conditions: max. temp. 90F, rel. hum. 80%

| Pipe Size, Inches CT, O.D. | IPS, nom. | Recommended Minimum Support Length, Inches* | Recommended Maximum Pipe Hanger Spacing, feet* |
|---|---|---|---|
| ⅜ | – | 3 | 7 |
| ½ | ¼ | 4 | 7 |
| ⅝ | ⅜ | 4 | 7 |
| ¾ | – | 4 | 7 |
| ⅞ | ½ | 4 | 7 |
| – | ¾ | 6 | 7 |
| 1⅛ | – | 6 | 8 |
| – | 1 | 6 | 8 |
| 1⅜ | – | 6 | 9 |
| 1⅝ | 1¼ | 8 | 9 |
| – | 1½ | 10 | 9 |
| 2⅛ | – | 8 | 10 |
| – | 2 | 12 | 10 |
| 2⅝ | – | 12 | 11 |
| – | 2½ | 18 | 12 |
| 3⅛ | – | 18 | 13 |
| – | 3 | 18 | 14 |
| 4⅛ | – | 18 | 14 |
| – | 4 | 18 | 16 |
| | | | 16 |

*Minimum support length and maximum hanger spacings are based on one pipe. For pipes less than 1½" IPS, a 28 ga. metal shield of same length as the rigid Aerotube should be used. Pipes of 1½" IPS and larger use 26 ga. shields.

292541 

An Insulation for Every Commercial and Industrial Purpose
JOHNS-MANVILLE JM PRODUCTS




## J-M MICRO-AIRE preformed fiber glass duct

**DESCRIPTION:** Made from long, fine, flame-blown glass fibers, J-M Micro-Aire duct is a preformed fiber glass duct for cooling—heating systems. An "all-in-one" duct material, it was designed by J-M engineers to provide thermal insulation, vapor barrier, and acoustical absorption in one product. Micro-Aire is furnished with a seamless vapor barrier jacket made of smooth, attractive aluminum-pigmented plastic which is tough and fire-resistant.

An exclusive Micro-Aire feature is an integral "slip-joint" which makes possible strong, snug connections between sections. No expensive tools or equipment are required for installation.

**AVAILABLE FORMS:** Micro-Aire is supplied in round and rectangular tubular form. For size information see "Standard Sizes" on Specification Data page. Fittings are available from the J-M factory or can easily be fabricated in the customer's shop, or at the job site.

**USES:** Micro-Aire is ideal for duct systems in new structures as well as for replacement and remodeling of older metal systems.

**ADVANTAGES:**

**Better Temp. Control**

Micro-Aire helps deliver the air at the desired temperature and eliminates condensation worries. Its k factor is 15 to 20% lower than fiber glass duct wrap commonly used on metal ducts.

**Quiet Operation**

Micro-Aire's outstanding noise absorption capabilities help eliminate objectionable operating noises.

**Noiseless Installation**

Micro-Aire is ideal for installation in existing occupied buildings since many of the installation noises normally encountered with metal ducts are absent when installing Micro-Aire.

**Resists Damage**

Micro-Aire is tough. Its cylindrical or rectangular, one-piece construction provides high structural strength. Resilient glass fibers and durable plastic jacket resist impact damage during and after installation. And the glass fibers won't rot . . . are odorless and vermin-proof.

**Lower Installation Costs**

Micro-Aire costs less to install due to its exclusive "slip-joint" construction and easy workability. Installation is simple. Only pressure-sensitive tape, the J-M cutting tool (for making slip joint ends on shortened pieces) and a knife are needed to assemble the duct. No messy adhesives are used.

**Meets Code Requirements**

Micro-Aire duct is highly flame-resistant and easily meets fire rating requirements of NBFU Standards 90A, 90B and U.L. 181, Class 1, "Standards for Safety," for air ducts.

292515



## J-M MICRO-AIRE Specification Data

| | |
|---|---|
| Density (nominal) | 3.35 pcf |
| Maximum Air Velocity | 2000 fpm** |
| Maximum Service Temp. | 250F |
| Maximum Internal Pressure | 2" water |

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

**Micro-Aire has been tested in the Underwriters' Laboratories at velocities of 5400 fpm and in the J-M laboratories at velocities exceeding 11,000 fpm. See local J-M sales representative for make recommendations for systems operating at velocities higher than 2000 fpm.

### THERMAL CONDUCTIVITY

| MEAN TEMPERATURE, F | 50 | 75 | 100 |
|---|---|---|---|
| CONDUCTIVITY: BTU IN. PER SQ FT PER F PER HR | .22 | .23 | .24 |

### STANDARD SIZES

Micro-Aire is available in standard round duct sizes from 4" through 30" I.D. Rectangular Micro-Aire is available in various cross-sectional dimensions ranging from 6" x 8" to 16" x 18" internal dimensions. All sections are furnished in 6' lengths overall.

### UNDERWRITERS' LAB. CLASS.

Listed by U.L. as complying with Class I (UL 181) Standards of Safety for Air Ducts

| | Exterior Face | Interior Face |
|---|---|---|
| Flame Spread | 15 | 15 |
| Fuel Contributed | 20 | 25 |
| Smoke Developed | 5 | 0 |

### SOUND ATTENUATION

Tested on a #6 mounting, Micro-Aire has an NRC over .90. The following tabulation reflects duct sound attenuation in decibels/foot based on actual laboratory tests:

| Round Duct Size, I.D., Inches | 125 | 250 | 500 | 1000 | 2000 | 4000 |
|---|---|---|---|---|---|---|
| | Sound Attenuation in Decibels per Foot at Frequency (cycles per second) of | | | | | |
| 6 | 0.5 | 2.0 | 5.3 | 11.4 | 16.6 | 20.0 |
| 8 | 0.3 | 1.3 | 3.2 | 7.0 | 14.4 | 18.5 |
| 10 | 0.2 | 1.1 | 2.5 | 6.0 | 12.2 | 18.0 |
| 14 | 0.1 | 0.8 | 1.5 | 3.2 | 4.3 | 6.6 |

### BUILD. CODE COMPLIANCE

Micro-Aire is approved by all major building code authorities including:

Building Officials Conference of America, Inc.
Southern Building Code Congress
International Conference of Building Officials
National Board of Fire Underwriters (meets fire rating requirement Standards 90A, 90B)

### PACKAGING INFORMATION

| I.D. Duct Sizes*, Inches | Carton Contents: No. of Sections | Carton Contents: No. of Feet | Carton Type** | Approx. Gross Shipping Weight, lbs. per carton |
|---|---|---|---|---|
| 4 | 24 | 144 | A | 70 |
| 5 | 15 | 90 | B | 52 |
| 6 | 13 | 78 | A | 61 |
| 7 | 8 | 48 | C | 40 |
| 8 | 8 | 48 | B | 40 |
| 9 | 6 | 36 | A | 38 |
| 10 | 6 | 36 | A | 40 |
| 12 | 3 | 18 | A | 28 |
| 14 | 2 | 12 | C | 23 |
| 16 | 4 | 12 | C | 28 |
| 18 | 4 | 12 | B | 28 |

*For rectangular duct sizes, and round duct sizes greater than 18", contact local J-M Sales Office.

**Carton Dimensions:
Type A—24" x 36" x 77½";
Type B—20" x 40" x 77½";
Type C—18" x 36" x 77½".

292516



An Insulation for Every Commercial and Industrial Purpose

JM

# J-M MICROLITE® fiber glass flexible insulation

**DESCRIPTION:** Microlite is a low-density, resilient, blanket-type thermal and acoustical insulation made of long, extremely fine, flame blown glass fibers, bonded with a thermosetting phenolic resin.

**AVAILABLE FORMS:** Made in blanket form and packaged in rolls. See table on opposite page for densities and thicknesses.

**USES:** Microlite is most useful:

Where greatest thermal and acoustical efficiency in the smallest space is required.

Where lightness in weight is important.

Where tensile strength, resiliency, ease of cutting and fitting help to reduce application and fabricating costs.

Where resistance to vibration shakedown is important.

**ADVANTAGES**

**Reduces Heat Transfer**

The enormous number of air pockets created by the very fine glass fibers make Microlite highly resistant to the passage of heat.

**Absorbs Sound**

The air pockets also become "sound traps" to soak up air-borne noises, particularly in the 125 to 4000 cps range.

**Resilient and Flexible**

Easily compressed into tight spots; springs back to assure snug fit around angles and curved surfaces; resists breakdown and sagging from vibration and bumps; yields under impact without damage.

**Conserves Space**

Because of its excellent insulating efficiency, space required for insulation can often be reduced. Compression packaging saves shipping, storage and work space. Insulation quickly returns to original thickness when unrolled.

**Strong**

Long fibers give blankets high tensile strength; won't pull apart with normal handling.

**Easy to Handle and Apply**

Can be handled without discomfort. Readily cut with knife or scissors. No special tools or skills needed. Can be used with adhesives and mechanical fasteners.

**Durable**

Glass fibers are incombustible. Being non-cellular and non-hygroscopic, they resist effect of moisture. Fibers will not decompose or provide food for rodents, insects or bacteria. Microlite resists effects of oil, grease, most acids.

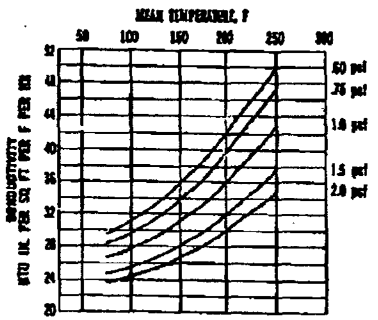
202547



# MICROLITE
## Specification Data

| Density, lbs per cu ft | Thickness, inches | Sound Absorption Coefficient Frequency 125 | 250 | 500 | 1000 | 2000 | 4000 | Mounting No. |
|---|---|---|---|---|---|---|---|---|
| ½ | ½ | .08 | .14 | .32 | .64 | .73 | .73 | 4 |
| ½ | 1 | .14 | .25 | .51 | .80 | .78 | .76 | 4 |
| ½ | 1½ | .18 | .44 | .77 | .92 | .81 | .77 | 4 |
| 1 | ½ | .08 | .16 | .37 | .68 | .77 | .78 | 4 |
| 1 | 1 | .12 | .30 | .58 | .94 | .82 | .80 | 4 |

*unfaced




### FACING INFORMATION

AVAILABLE ON ALL DENSITIES AND THICKNESSES
Type and Description

| | | |
|---|---|---|
| [illegible] | LIGHTWEIGHT VAPOR BARRIER PAPER (Reinforced Kraft, Light) Two layers of 30 lb. Kraft paper, reinforced with fiber glass yarn scrim (1" x 1" spacing) in asphalt lamination. | |
| [illegible] | ALUMINUM FOIL | High degree of heat reflection. Foil adds its own insulating value through its excellent radiant heat reflectivity. Incombustible. |
| [illegible] | ALUMINUM FOIL (Recommended as vapor barrier) | |
| [illegible] | REINFORCED FOIL AND PAPER (Foil, Scrim, Kraft) A layer of aluminum foil, reinforced with fiber glass yarn mesh and laminated to 40 lb. [illegible] Kraft. Very strong; foil adds to insulating value. | |
| [illegible] | VINYL PLASTIC Aluminum white or green pigmented. Effective vapor barrier. Provides attractive finish. | |

### COMPLIANCE WITH GOVERNMENT SPECS

HH-I-542, Type I (except for corrosivity)

Maritime Specification 32-[illegible]-3, class 1 & 2
MIL-I-22023, Type I and II, classes 1 thru 5
MIL-I-59240, Type II and IIA (.6 pcf), Type III and IIIA (1.0 pcf)

HH-I-521C, Type I, class A & B

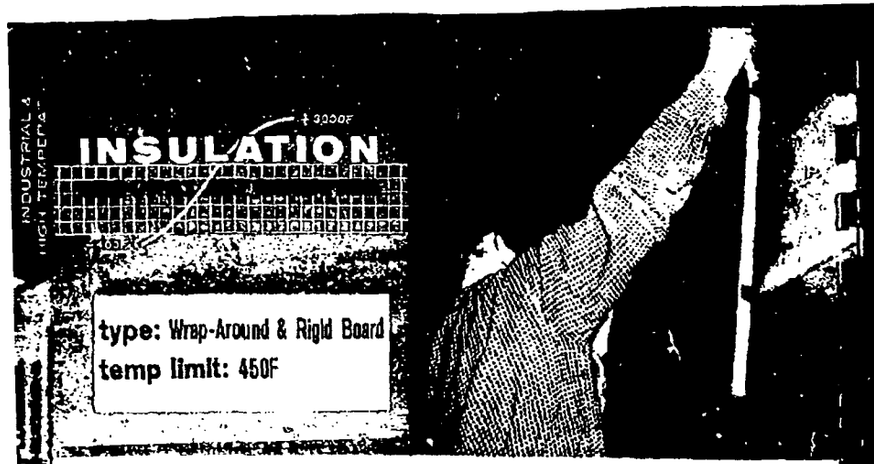
### STANDARD DENSITIES AND PACKING*

| Density*, lbs per cu ft | Thickness*, inches 200-ft roll | 100-ft roll | 50-ft roll |
|---|---|---|---|
| .6 | – | ½, 1, 1½, 2 | 3 |
| .75 | ½ | – | – |
| 1.0 | ½ | 1, 1½ | 2 |
| 1.5 | ½ | 1 | – |
| 2.0 | – | ½ | 1 |

*All densities and thicknesses are available in 24", 36", 48" and 72" without facing, or 24", 36" and 48" faced.

2925 18

*An Insulation for Every Commercial and Industrial Purpose*




# J-M SPINTEX® duct insulation

**DESCRIPTION:** J-M Spintex duct insulation is felted from long, tough, super-springy siliceous fibers. Produced by an exclusive spinning process which assures the utmost uniformity, these fibers possess unusual fineness. This adds countless heat-stopping dead-air spaces to every cubic inch of Spintex, and gives the material the low thermal conductivity so essential for high insulating value. Spintex fibers are non-absorptive and treated to arrest capillary action, and will neither rot nor mildew.

**AVAILABLE FORMS:** Regularly furnished in flexible wrap-around and rigid board form. The following special facings are available to meet unusual conditions or decorative needs.

VS Kraft paper and asphalt

FSK Laminate .001" aluminum foil-scrim-kraft

EAF Embossed aluminum foil

**USES:** J-M Spintex duct insulation is ideal for insulating housings and air-conditioning ducts in offices, factories, institutions and commercial buildings of all kinds.

**ADVANTAGES**

**Corrosion Resistant**

Tested in accordance with the provision of U.S. Maritime Commission Specification 32-MC-1, Spintex when placed in physical contact with a polished steel plate exposed to alternate wetting and drying cycles causes no more corrosion than sterile cotton under similar test conditions.

**Moisture Resistant**

Spintex fibers are solid filaments, non-absorptive in themselves and treated to prevent hygroscopic or capillary action of the felt.

**Incombustible**

Spintex insulation rates as *incombustible* when tested according to U. S. Bureau of Standards Commercial Standard CS-181-46, Section VI, and will pass the test prescribed in U.S. Coast Guard Specification 164-009.



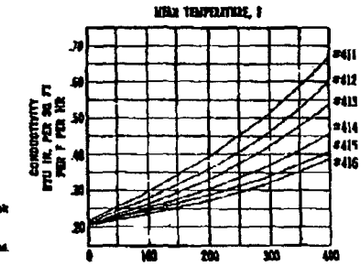
292519

# SPINTEX
## Specification Data

| Type | Description | Combustible | Water-vapor barrier |
|---|---|---|---|
| VS | Kraft paper and asphalt* | yes | yes |
| FSK | Laminate .001" aluminum foil-scrim-kraft | no | yes |
| EAF | Embossed aluminum foil | no | yes |

*No. 413, 414, 414 Special and 415 only. Sheathing paper and asphalt laminated on No. 411.

**Facing will burn but fibers pass out when source of heat is removed. Flame is not transmitted along facing.




## STANDARD SIZES, THICKNESSES AND AVAILABLE FACINGS

| Type | Density, pcf | Length, inches | Width, inches | Thickness, inches | Facings |
|---|---|---|---|---|---|
| No. 411 (flexible) | 3.00 | 60, 120 | 30 | 1, 1½, 2 | VS, FSK |
| No. 412 (flexible) | 3.50 | 48, 60 | 15, 20, 30* | 1, 1½, 2, 3 | VS, FSK |
| No. 413 (flexible) | 4.25 | 48, 60 | 15, 30* | 1, 1½, 2, 3 | VS, FSK |
| No. 414 (rigid) | 6.00 | 48, 60 | 15, 30* | 1, 1½, 2 | VS, FSK, EAF |
| No. 414 Special (rigid) | 6.00 | 48, 60 | 15, 30* | 1, 1½, 2 | VS, FSK, EAF |
| No. 415 (rigid) | 8.00 | 48, 60 | 15, 30* | 1, 1½, 2 | VS, FSK, EAF |

*Spintex No. 412, 413, 414, 414 Special and 415, when faced are available in 30" width only.

## COMPLIANCE WITH GOVERNMENT SPECS

HH-I-542 Type I-411 in rolls or sheets up to 2" thick
Type II-412, 413, 414, Special 414 & 415
In sheet form only plain or faced

HH-I-563 Type I, class 2 414 & 3 only
Special 414 & 415 (Plain or faced)

HH-I-563 Type II, class D 411, 412, 413, 414, Special 414, 415

HH-I-564 Form I, class A & B 414 & 3 only
Special 414 & 415 (Plain or faced)
Form II, class A & B same as above

## FOR SEALING DUCT INSULATION JOINTS...

### J-M DUTCH BRAND
PRESSURE SENSITIVE TAPE

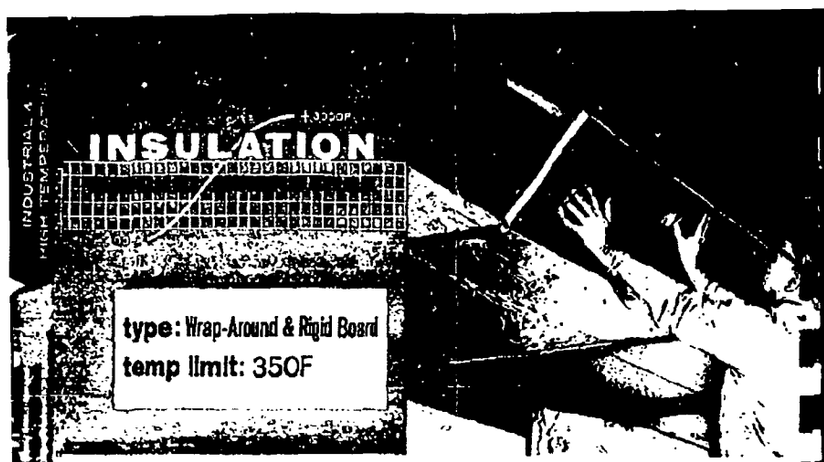
Johns-Manville recommends J-M Dutch Brand No. 353 Sealing Duct Sealing Tape for forming, holding and sealing air duct insulation. Specially treated waterproof, weather-resistant Scrim Backing provides excellent vapor barrier. Adhesive gives overlapping surfaces 24 hour protection even at joints and contours.

Backing ..... Cloth-colored plastic coating.
Color ..... Silver.
Adhesive Mass ..... Water insoluble—rubber and resin base.
Roll Lengths ..... 60 yds. (Special lengths on inquiry).
Widths ..... All standard widths.
Core Size ..... 3"
Packing ..... Roll tape with each roll separated, carton separated.

292550



*An Insulation for Every Commercial and Industrial Purpose*




## J-M MICROTUF duct insulation

**DESCRIPTION:** J-M MicroTuf duct insulation is manufactured from long, extremely fine inorganic glass fibers bonded by a thermosetting resin. MicroTuf is suitable for use on heating ducts, or, with a suitable factory-applied vapor barrier, on air conditioning ducts. Can also be used as an acoustical lining for sheet metal ducts.

**AVAILABLE FORMS:** MicroTuf is made in sheet form, and is available in sizes which are easy to handle during application. It can be supplied plain, faced, or with an NBFW-90A approved coating. See table of available facings on opposite page.

**USES:** MicroTuf can be used plain for heating ducts, or with faced surfaces for below ambient application. It can also be coated with a special black neoprene which meets all requirements of Standards 90A of NBFW-90A.

**ADVANTAGES:**

**High Thermal Performance**

Extremely fine fiber diameter creates vast number of tiny air pockets which make MicroTuf highly resistant to the passage of heat.

**Absorbs Sound**

Tiny air pockets act as very effective "sound traps" to absorb unwanted air-bounce noise.

**Workability**

Because of the highly resilient nature of its fine glass fibers, MicroTuf can be bent around corners without need for additional scoring. It can be readily cut with a knife obviating the need for special tools or shifts. MicroTuf can be applied with either adhesives or mechanical fasteners.

**Durable**

Glass fibers are incombustible and resistant to moisture, oil, grease, and most acids.



292551

## MICROTUF
### Specification Data

| | |
|---|---|
| Density: | |
| Type A | nominal 1.5 pcf |
| Type B | nominal 3.0 pcf |
| Moisture Absorption | less than 0.2% by volume |
| Corrosion | will not cause or accelerate |
| Maximum temperature | 350F |

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

### STANDARD SIZES AND THICKNESSES

| TYPE | THICKNESS, inches | DIMENSIONS, inches | BOARD FEET/CARTON |
|---|---|---|---|
| A | 1, 1½, 2 | 30 x 48<br>& 30 x 60 | 140<br>150 |
| B | ½, 1, 1½, 2 | 30 x 48<br>& 30 x 60 | 140<br>150 |

### AVAILABLE FACINGS

| | |
|---|---|
| FSK | Reinforced Foil & Paper<br>A layer of aluminum foil laminated to a fire-resistant Kraft paper with 1-44 glass fiber reinforcement between the laminates. |
| SAT | .0025 Embossed Aluminum Foil |
| 15 | A reinforced Kraft paper & asphalt lamination |
| Coating | A special neoprene, black in color, meeting the National Board of Fire Underwriters' 90A Standards is available on Microtuf "B" only |

### THERMAL CONDUCTIVITY

MEAN TEMPERATURE, 75F

| | |
|---|---|
| Type A (1.5 pcf) | .25 |
| Type B (3.0 pcf) | .23 |

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



*An Insulation for Every Commercial and Industrial Purpose*

**type: Semi-Rigid Blanket**
**temp limit: 250F**

## J-M MICRO-BAR fiber glass duct liner

**DESCRIPTION:** Micro-Bar is a resilient, semi-rigid, blanket type insulation made of strong, very fine, inorganic glass fibers bonded by a thermosetting resin. Micro-Bar combines two separate densities. On one side is a thin, tough, heavy density material to check air erosion and shop handling. Underneath is a thicker, lighter density body for greater sound absorption and thermal insulation.

**AVAILABLE FORMS:**

Micro-Bar is coated with a special neoprene meeting NBFU-90A to prevent the possibility of fiber erosion.

**USES:** Recommended for air conditioning and heating ducts at velocities up to 5000 FPM (although it has been tested in the laboratory for velocities above 8000 FPM without noticeable change).

**ADVANTAGES**

**Durable—Resists Damage**

Micro-Bar's "dual-density" with a NBFU-90A coating provides a tough surface to withstand the punishing force of high velocity air at 5000 fpm. It also resists accidental damage during fabrication.

**Protects Leading Edges**

When formed over the edge of the insulation, Micro-Bar's tough surface prevents rushing air from getting into or under the insulation, thus resisting tearing or lifting. With Micro-Bar, it is not necessary to provide a "Z" strip or metal nosing.

**Reduces Heat Transfer**

The enormous number of minute air pockets created by the very fine glass fibers make Micro-Bar highly resistant to the passage of heat.

**Absorbs Sound**

Micro-Bar traps and absorbs undesirable sound in the millions of dead air spaces formed by the random pattern of the extremely fine glass fibers. See opposite page for sound absorption coefficients.

**Low Fire Hazard Rating**

Micro-Bar meets standard No. 90A of the National Board of Fire Underwriters as recommended by National Fire Protection Association.

**Lightweight**

Micro-Bar adds little to the over-all weight of the duct. Also saves in transportation, storage and fabrication.

**Extremely Resilient**

Resists breakdown and sagging from vibration, corners and edges do not crumble.

**Easy to Handle and Apply**

No special equipment, clothing or skills needed to apply. Easily applied to irregular surfaces.

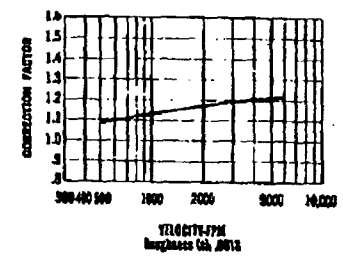


292553

## MICRO-BAR
### Specification Data

| Thicknesses Backed | Frequencies 125 | 250 | 500 | 1000 | 2000 | 4000 |
|---|---|---|---|---|---|---|
| ½ | .35 | .43 | .41 | .54 | .70 | .82 |
| 1 | .41 | .48 | .70 | .90 | .93 | .78 |

*These coefficients were determined from tests made by Riverbank Acoustical Laboratories, Arcover Research Foundation, Geneva, Ill., in accordance with provisions of test method ASTM C-423-63T. All tests made on No. 6 mounting.




**THERMAL CONDUCTANCE**

| Mean Temperature, °F | Thickness Backed | Width (Inches) | Roll Length (Feet) |
|---|---|---|---|
| 1" thick—.23 | | | |
| 1½" thick—.15 | ½ | 24,36,48 | 100 or 200 |
| CONDUCTANCE, BTU PER SQ FT PER F PER HR | 1 | 24,36,48 | 50 |

**STANDARD PACKING**

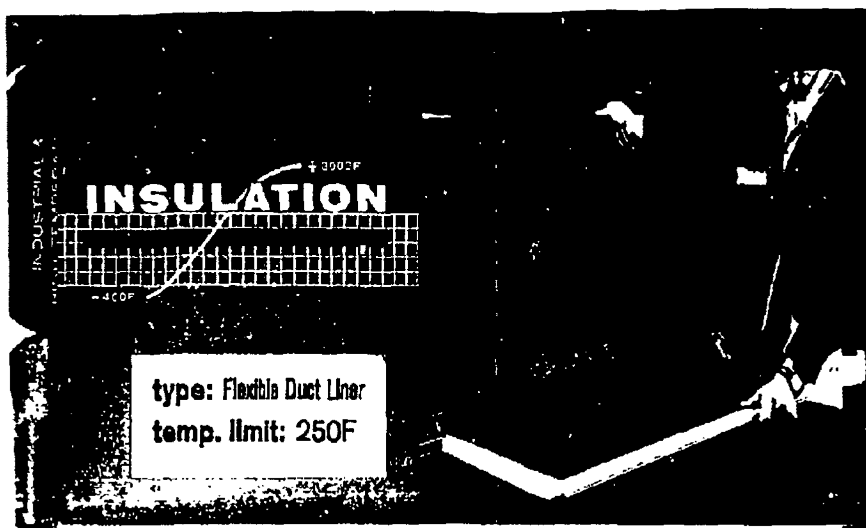
**UNDERWRITERS' LABORATORIES FIRE HAZARD CLASSIFICATION**

| | |
|---|---|
| Flame Spread | 25 |
| Fuel Contributed | 15 |
| Smoke Developed | 0 |

292554



*An Insulation for Every Commercial and Industrial Purpose*




## J-M MICROLITE® fiber glass duct liner

**DESCRIPTION:** Long, extremely fine flame-blown glass fibers are bonded with a thermo-setting resin to produce Microlite Duct Liner. Countless air pockets created by the fine fibers make this low density duct liner highly effective in trapping air-borne noise and in resisting the passage of heat. Microlite Duct Liner is strong and tough, yet soft and resilient. Its fibers do not support combustion, absorb moisture, nor contribute to the corrosion of metals. Furnished with a spray coating of fire-resistant neoprene on one side to prevent possible air erosion, reduce surface friction, and meet the requirements of NFPA and NBFU-90A.

**AVAILABLE FORMS:** Microlite Duct Liner is available in blanket form and packaged in rolls. (See table on opposite page for available dimensions.)

**USES:** Microlite Duct Liner is recommended as an effective acoustical liner for either air conditioning or heating ducts. It adheres well to sheet metal and can be formed simultaneously with the rectangular metal duct in a sheet metal brake. Its flexibility makes it readily adaptable to circular ducts.

**ADVANTAGES:**

**Mutes Noise**

Microlite Duct Liner's high acoustical value stops "cross talk" between rooms, and decreases annoying fan and "air rush" noises. In contact with metal helps dampen vibration.

**Reduces Heat Transfer**

Has a k factor of 0.23. This reduces heat loss through warm air ducts and heat gain in cooling ducts, which in turn means better temperature control.

**Absorbs Sound**

Traps and absorbs a maximum of noise and is particularly effective in the 250 to 4000 cps range where most objectionable equipment noises occur. (See Sound Absorption Coefficient table on the opposite page.)

**Low Fire Hazard Rating**

Microlite Duct Liner meets all the requirements of NFPA, and standard 90A of the National Board of Fire Underwriters.

**Light Weight**

Adds little over-all weight to the duct system. 1" thick material increases over-all weight of the duct no more than 2 oz per sq ft.



2925[illegible]

## MICROLITE®
### Specification Data

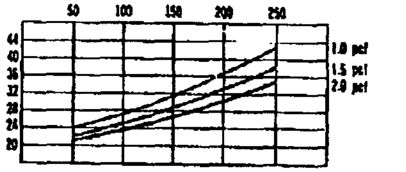
| Density, (pcf) | Thickness, (inches) | Width, (inches) | Roll Length, (inches) |
|---|---|---|---|
| 1 | ½ | | 200 |
| | 1 | 36, 48 | 100 |
| | 1½ | | 100 |
| | 2 | | 50 |
| 1½ | ½ | | 100 |
| | 1 | 36, 48 | 50 |
| | 1½ | | 50 |
| 2 | ½ | 36, 48 | 100 |

### SOUND ABSORPTION COEFFICIENTS*

| Density, (pcf) | Thickness, (inches) | Sound Absorption Coefficient Frequency 125 | 250 | 500 | 1000 | 2000 | 4000 |
|---|---|---|---|---|---|---|---|
| 1.0 | ½ | .25 | .43 | .47 | .59 | .65 | .67 |
| | 1 | .35 | .55 | .73 | .84 | .83 | .68 |
| | 1½ | .40 | .57 | .68 | .85 | .82 | .79 |
| | 2 | .44 | .75 | .99 | .99 | .89 | .79 |
| 1.5 | ½ | .28 | .42 | .49 | .62 | .76 | .77 |
| | 1 | .35 | .45 | .64 | .89 | .87 | .84 |
| | 1½ | .54 | .74 | .86 | .96 | .90 | .85 |
| 2.0 | ½ | .23 | .42 | .45 | .56 | .79 | .74 |

*Coefficients were determined from tests made by [illegible] Acoustical Laboratories, Armour Research Foundation, [illegible], in accordance with provisions of test method ASTM [illegible]. All tests made on mounting #6.

### THERMAL CONDUCTIVITY




### UNDERWRITERS' LABORATORIES FIRE HAZARD CLASSIFICATION

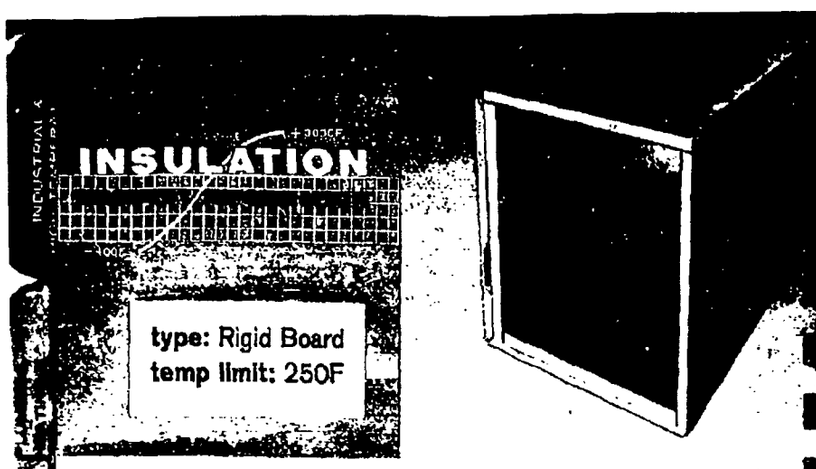
| | |
|---|---|
| Flame Spread | 15 |
| Fuel Contributed | 20 |
| Smoke Developed | 5 |

292556



*An Insulation for Every Commercial and Industrial Purpose*

WEATHERPROOFING




## J-M COATED SPINTEX duct liner

**DESCRIPTION:** J-M Coated Spintex Duct Liner is a rigid board insulation consisting of long, tough siliceous fibers produced by a spinning process which assures the utmost uniformity. Spintex coated duct liner is completely inorganic except for a small percentage of binder. Black plastic Coated Spintex Duct Liner complies with the National Board of Fire Underwriters' Standards No. 90A and 90B.

**AVAILABLE FORMS:** J-M Coated Spintex Duct Liner is furnished in rigid board form in the following dimensions:

DENSITY: 6 pcf

THICKNESSES: ¾", 1", 1½", 2"

STANDARD SIZES: 48" x 30"
48" x 60"
24" x 30"
24" x 60"

**USES:** J-M Coated Spintex Duct Liner is ideal for lining air-conditioning and heating ducts where a rigid board type material is required for velocities up to 5000 fpm.

### ADVANTAGES

**Easy to Apply**

Coated Spintex cuts readily and requires no special tools or skills. It is pleasant to handle and uses standard adhesives and fastening devices.

**Absorbs Sound**

Innumerable fine fibers trap sound energy and greatly dissipate objectionable noises caused by equipment.

**Resists Heat Flow**

The enormous quantity of dead air spaces provides low thermal conductivity and effectively resists the transfer of heat.

**Corrosion Resistant**

Spintex fibers are non-absorptive and resist capillary action. The fibers will not rot or mildew.

**Resists Air Erosion**

Coated Spintex has a smooth, tough surface with an average friction factor of .025.



292557

## COATED SPINTEX
### Specification Data

| | |
|---|---|
| Density, lbs/cu ft | 6 |
| Surface friction factor, coated side | .025 avg. |
| Absolute roughness, (k) coated side | .0015 |
| Maximum Air Velocity, fpm | 5000 |

Fire Hazard Classification of black plastic coated side per ASTM Test Method E84-50T: flame spread 12, fuel contributed 20, smoke developed 20.

| MEAN TEMPERATURE, F | BTU IN. PER SQ FT PER F PER HR |
|---|---|
| 50 | .23 |
| 75 | .24 |
| 100 | .25 |
| 200 | .30 |

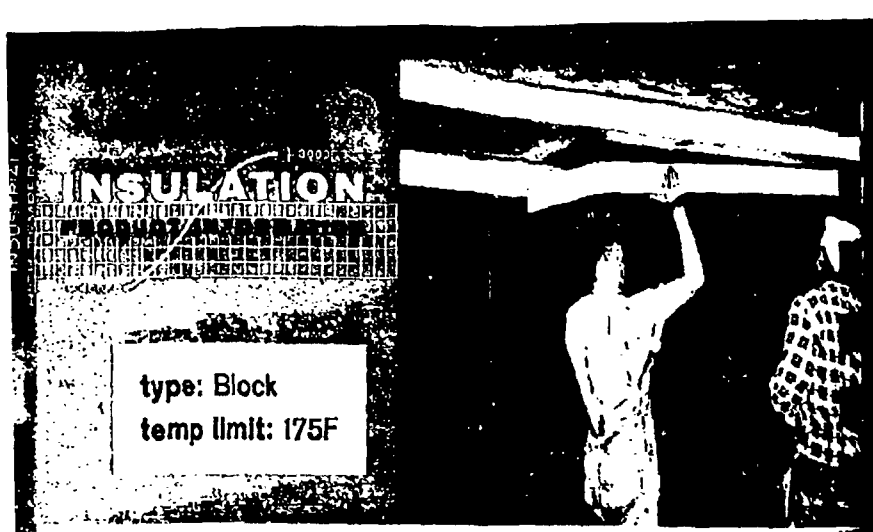
### SOUND ABSORPTION COEFFICIENTS*

| | Thicknesses (inches) | Frequencies 125 | 250 | 500 | 1000 | 2000 | 4000 | Mounting No. |
|---|---|---|---|---|---|---|---|---|
| | 1 | .44 | .45 | .88 | .99 | .94 | .82 | 5 |
| SPINTEX 414 | 1½ | .51 | .70 | .99 | .99 | .97 | .94 | 6 |
| | 2 | .79 | .68 | .99 | .99 | .86 | .85 | 6 |

*Coefficients were determined from tests made by Riverbank Acoustical Laboratories, Illinois Research Foundation, Geneva, Ill., in accordance with provisions of test method ASTM C-423-60T. All tests made on mounting #6.



*An Insulation for Every Commercial and Industrial Purpose*




## J-M ZERO-LITE expanded polystyrene insulation

**DESCRIPTION:** Zero-Lite is a low temperature expanded polystyrene insulating block featuring extreme lightness (1 lb pcf) and low thermal conductivity.

**AVAILABLE FORMS:** Furnished in sheets 18" and 24" wide by 4' (normally) in length. Standard thicknesses 1", 1½", 2", 3", 4". Also available in sheets up to 12' x 4' x 8" thick.

NOTE: A form of Zero-Lite, self-extinguishing according to ASTM D-1692-59T, is available. Its density averages 1.0 lb pcf; other properties essentially the same as regular Zero-Lite.

**USES:** Recommended for use in cold storage rooms for ceilings, walls, floors. May be applied to either wood or concrete.

### ADVANTAGES

**Extra Low Conductivity**

Thermal conductivity is only .22 at 0F; .24 at 40F; and .26 at 80F mean temperature.

**Extreme Lightness**

A cubic foot of Zero-Lite weighs only one pound; a single workman can easily carry a dozen sheets at a time.

**Easy Installation**

Light weight and larger sizes plus ease of securing speeds installation. One man can easily place a standard sheet of Zero-Lite in position and hold it momentarily until adhesive grips.

**Large Size Sheets**

Large sheets cover more surface and reduce the number of joints.

**Strong and Resilient**

Zero-Lite is not brittle, recovers quickly when pressed. It is amply strong for use in erecting self-supporting partitions.

**Completely Inert**

A safe and sanitary, completely inert insulating material, Zero-Lite will not rot, mold, or attract vermin or termites.

**Moisture Resistant**

No capillarity; non-hygroscopic; moisture permeability average: 2 perm inches.

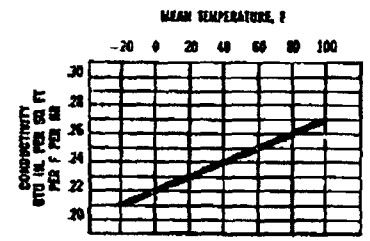


292559

## ZERO-LITE Specification Data

| | |
|---|---|
| Density | 1.0 to 1.2 lbs per cu ft |
| Compressive Strength | |
| Load to compress 5% | 9.0 to 12.0 psi |
| Tensile Strength | 30.0 psi |
| Water Absorption, 10" submersion 48 hours, HH-I-524 | < .1 lb/sq ft |
| Capillarity | none |
| Water Vapor Permeability, avg. | 2 perm in. |
| Maximum Recommended Temperature | 175F |
| Coefficient of Expansion | $25 \times 10^{-6}$ |
| Dimen. change, 1 week at 175F | −0.4 to −0.7% |

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




### COMPLIANCE WITH GOVERNMENT SPECS

HH-I-524 Interim Amendment #3
Type I, classes 1 & 2

HH-P-406b
Type I, Classes 1 & 2, Grade A

### STANDARD SIZES*

| Length, ft | Width, inches | Thickness, inches |
|---|---|---|
| 4 | 18, 24 | 1, 1½, 2, 3, and 4 |

*other sizes available up to 12' x 4' x 8".

### RECOMMENDED THICKNESSES

For average conditions the following thicknesses are considered good practice:

| Operating Temp., F | Thickness of Zero-Lite, inches | Operating Temp., F | Thickness of Zero-Lite, inches |
|---|---|---|---|
| 45 | 2 | −15 | 7 |
| 30 | 3½ | −30 | 8 |
| 15 | 4½ | −45 | 9 |
| 0 | 6 | | |

292560



*An Insulation for Every Commercial and Industrial Purpose*

INSULATION

+3000F

**type:** Fill
**temp limit:** –400F to 1200F

## J-M MICRO-CEL T-4 and T-2 cryogenic powders

■ **DESCRIPTION:** Johns-Manville Micro-Cel T-4 and T-2 are synthetic calcium silicates that have demonstrated high efficiency as cryogenic insulations. These finely divided powders exhibit excellent free flow characteristics. Micro-Cel T-4 is recommended for use both under vacuum and at atmospheric pressure. Micro-Cel T-2 is primarily recommended for use under evacuated conditions.

■ **AVAILABLE FORMS:** Micro-Cel T-4 and T-2 are furnished in loose powder form.

■ **USES:** Micro-Cel T-4 and T-2 are recommended as loose fill insulation for cold boxes and as evacuated powders to insulate liquefied gas storage or transport vessels, particularly where boil-off rates and space requirements are critical.

■ **ADVANTAGES:**

Easy to Install

Micro-Cel T-4 and T-2 are installed quickly either by emptying the large bags directly into the vessel to be insulated or by the use of air handling systems.

Light Weight

Both Micro-Cel T-4 and T-2 are exceptionally light in weight and, consequently, easy to handle.

Highly Stable

Micro-Cel T-4 and T-2 do not break down during handling and retain their original density and conductivity even after a number of transfers.

Non-Abrasive

Micro-Cel T-4 and T-2 are non-abrasive and will not cause wear of handling equipment. These fills can be transferred more rapidly than other conventional cryogenic powders, resulting in less downtime.



29 2561

## MICRO-CEL Specification Data

| | MICRO-CEL T-2 | MICRO-CEL T-4 |
|---|---|---|
| Color | off-white | off-white |
| Loose Weight Density | 14.5 lbs per cu ft | 5.0 lbs per cu ft |
| Packed Density | 20.0 lbs per cu ft | 8.0 lbs per cu ft |
| Retained on 325 mesh | 11.0% | 1.0% |
| Free Moisture | 5.0% by weight | 3.0% by weight |
| Surface Area | 150 sq meters per gram | 95 sq meters per gram |
| Specific Gravity | 2.20 | 2.45 |
| Net Weight | 50 lbs per bag | 33.3 lbs per bag |

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

### THERMAL CONDUCTIVITY

When tested for thermal conductivity in space evacuated to less than 0.1 mm Hg, with temperature gradient of 300K to 76K and wall emissivity of 0.86, the following values were found:

| | MICROWATTS cm K | BTU IN. hr ft² F |
|---|---|---|
| Micro-Cel T-2 | 8.3 | .0058 |
| Micro-Cel T-4 | 7.8 | .0054 |

292562



*An Insulation for Every Commercial and Industrial Purpose* JM

type: Loose Wool
temp limit: -400 to +1000F

## J-M OIL-FREE SPUN BANROC® LOOSE
### mineral wool insulation

**DESCRIPTION:** J-M Oil-Free Spun Banroc Loose is composed of long, fine, spun mineral wool fibers especially processed to limit the organic (oil) content.

**AVAILABLE FORMS:** Packed in 3½ cu ft bags, weighing 30 lbs per bag.

**USES:** Recommended for liquid oxygen and other cryogenic applications to −400F.

**ADVANTAGES:**

**Low Oil Content**

The oil content is not more than 0.1%.

**Chemically Stable**

Fibers are 100% inorganic, will not burn or rot.

**Moisture Resistant**

Fibers are solid filaments and will not absorb water.

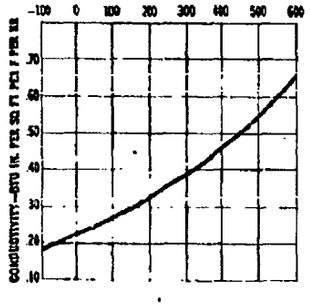
**Low Density**

Shipping density is only 8.5 lbs per cu ft.

**PHYSICAL PROPERTIES**

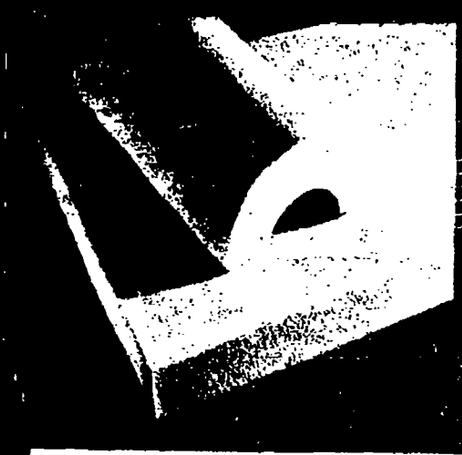
| | |
|---|---|
| Temperature Limit | −400 to +1000F |
| Bulk Density (as shipped) | 30 lbs per 3½ cu ft bag |
| Recommended Density Installed | 10-12 pcf |
| Maximum Density Installed | 15-18 pcf |
| Oil Content | 0.10% max. |
| Maximum Sulphide Content | less than 0.5% |
| Sulphide Content (water soluble) | less than 0.01% |

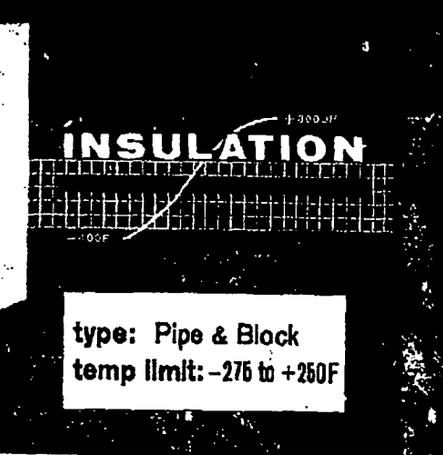
**THERMAL CONDUCTIVITY**






292563






type: Pipe & Block
temp limit: -275 to +250F

## J-M ZERO-FOAM rigid urethane pipe and block insulation

**DESCRIPTION:** Zero-Foam is a rigid polyurethane foam insulation for use at temperatures from −275F to +250F. Its exceptionally low *k* factor, light weight and dimensional stability make it ideal for low temperatures.

**AVAILABLE FORMS:** Furnished in both sectional pipe and block insulation forms.

**USES:** For low temperature lines, including chilled water, refrigerant, special process and dual temperature lines. Block form is suitable for low temperature equipment and for ceilings and walls of cold storage rooms.

**ADVANTAGES:**

**Dimensionally Stable**

Under extreme temperature changes Zero-Foam displays remarkable dimensional stability.

**Low Conductivity**

Low conductivity (.17 at 75F) provides high efficiency, permits less thickness.

**Self-Extinguishing**

Built-in self-extinguishing qualities resist spread of flame.

**Light Weight**

Zero-Foam (2 lbs per cu ft) permits faster handling with lower handling costs.

**Easy to Apply**

Quickly and accurately cut with an ordinary knife or saw. This facilitates application around valves and other obstructions.

| | |
|---|---|
| Density (nominal) | 2 lbs per cu ft |
| Compressive Strength | 30 psi to produce 5% compression |
| Coefficient of Lin. Expansion | $30 \times 10^{-6}$ |
| Water Absorption (submerged 2 weeks) | 3% maximum by vol. |
| Water Vapor Permeability | 2 perm. inch |
| Combustibility (ASTM 1692-59T) | Self-extinguishing |

| MEAN TEMPERATURE, 75F | CONDUCTIVITY: BTU IN. PER SQ FT PER F PER HR |
|---|---|
| Initial | .12 |
| Ultimate | .17 |

**STANDARD SIZES & THICKNESSES**

Pipe Insulation:

| Length | Nominal Thicknesses | Pipe Sizes |
|---|---|---|
| 3 ft sections | ½" thru 3" | ½" thru 12" |

Block Insulation:

| Length | Nominal Thicknesses | Widths |
|---|---|---|
| 4' and 8' | 1" thru 4" | 12", 24" and 48" |

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

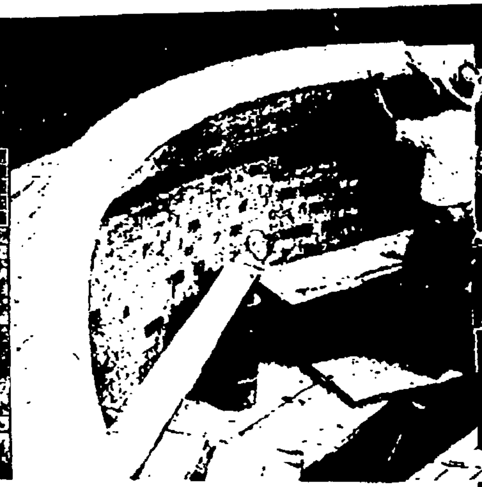


292563

*An Insulation for Every Commercial and Industrial Purpose*

# 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.





# INSULATING FIRE BRICK
## Specification Data

| | JM-3000 | JM-28 | JM-26 | JM-23 | JM-20 | JM-1620 |
|---|---|---|---|---|---|---|
| Temperature Limit | 3000F** | 2800F** | 2600F** | 2300F** | 2000F** | 2000F*** 1600F** |
| Approximate Density | 65 pcf | 58 pcf | 51 pcf | 31 pcf | 29 pcf | 27 pcf |
| Transverse Strength | 200 psi | 175 psi | 140 psi | 140 psi | 100 psi | 80 psi |
| Cold Crushing Strength | 400 psi | 300 psi | 210 psi | 110 psi | 150 psi | 95 psi |
| Linear Shrinkage | [illegible] at 3000F | 1.4% at 2800F | 1.0% at 2600F | 0.1% at 2300F | 0.0% at 2000F | 0.0% at 2000F |
| Reversible Thermal Expansion | 0.65-0.75% at 2000F | 0.65-0.75% at 2000F | 0.65-0.75% at 2000F | 0.5-0.6% at 2000F | 0.5-0.6% at 2000F | 0.5-0.6% at 2000F |

*The figures given in this table are average values obtained in accordance with accepted test methods.
**Back-up or exposed. ***Back-up only.
136-hr Simulative Service Panel Test, all others 24-hr soaking period.

| Type | No. of Brick per Carton |
|---|---|
| JM-3000 | 20 |
| JM-28 | 20 |
| JM-26 | 25 |
| JM-23 | 25 |
| JM-20 | 25 |
| JM-1620 | 25 |

**COMPLIANCE WITH GOVERNMENT SPECS**

JM-20 complies with MIL-B-16305A, class A
JM-28 complies with MIL-B-16305A, class B

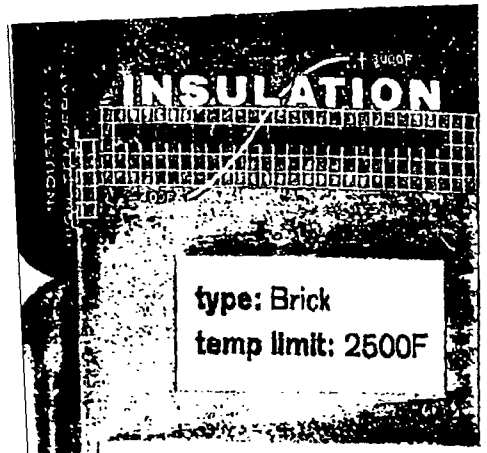
**STANDARD SIZES**

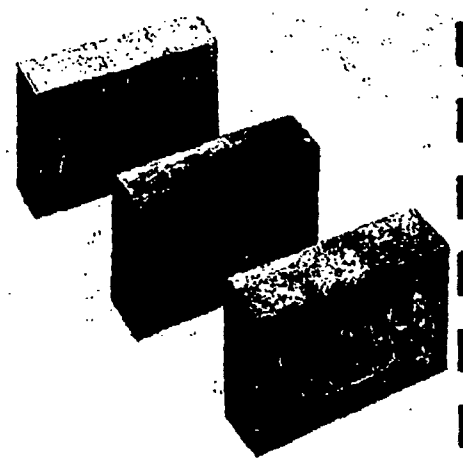
| Type | [illegible] |
|---|---|
| JM-3000<br>JM-28<br>JM-26<br>JM-23<br>JM-20<br>JM-1620 | Accurately sized in all standard 9 in. shapes of the 2½ and 3 in. series, as well as special shapes. |

**THERMAL CONDUCTIVITY**

| | MEAN TEMPERATURE, F | | | |
|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 |
| JM-3000 | 3.22 | 3.30 | 3.37 | 3.46 |
| JM-28 | 2.56 | 2.80 | 3.06 | 3.32 |
| JM-26 | 2.22 | 2.44 | 2.68 | 2.93 |
| JM-23 | 1.01 | 1.18 | 1.36 | 1.50 |
| JM-20 | 0.95 | 1.18 | 1.27 | 1.27 |
| JM-1620 | 0.90 | 1.07 | 1.27 | — |

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



# 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.



292567

# SIL-O-CEL INSULATING BRICK
## Specification Data

| | Super | C-22 | 16L |
|---|---|---|---|
| Temperature Limit | 2500F** | 2000F** | 1600F*** |
| Approximate Density | 40 pcf | 38 pcf | 34 pcf |
| Transverse Strength | 90 psi | 110 psi | 80 psi |
| Cold Crushing Strength | 300 psi | 700 psi | 350 psi |
| Linear Shrinkage | 2.0% at 2500F | 0.5% at 2000F | 0.7% at 1600F |
| Reversible Thermal Expansion | 1.3% at 2040F | 0.7% at 2000F | less than 0.1% at 1600F |

*The figures given in this table are average values obtained in accordance with accepted test methods.
**Back-up only. ***Back-up or exposed.

| | MEAN TEMPERATURE, F | | | |
|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 |
| Super | 1.70 | 1.95 | 2.19 | 2.45 |
| C-22 | 1.57 | 1.88 | 2.06 | — |
| 16L | 0.92 | 1.07 | 1.22 | — |

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

## COMPLIANCE WITH GOVERNMENT SPECS

Sil-O-Cel Super complies with MIL-B-16482B

## STANDARD SIZES

| Type | Size |
|---|---|
| Sil-O-Cel Super<br>Sil-O-Cel C-22<br>Sil-O-Cel 16L | Furnished in all standard 9 in. shapes of the 2½ and 3 in. series, as well as special shapes. |

## PACKAGING INFORMATION

All Sil-O-Cel Insulating Brick are packaged 25 to a carton.

292568



*An Insulation for Every Commercial and Industrial Purpose*

**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.

CA 2200 Insulating Firecrete–A light weight, low iron content refractory for use in controlled atmospheres. For service to 2200F.

No. 20 Firecrete–Similar to L.W. Firecrete but lighter. 58 lbs of dry material required for one cubic foot. Service to 2000F.

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

Lo-D Firecrete–Designed primarily for use as a back-up insulating refractory in naval boilers. Service to 2500F.

**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.



292569



# FIRECRETE
## Specification Data

| | 3X | H.T. | STD. | L.W. | CA Insulating | CA 2200 Insulating Firecrete | No. 20 | C-31 M Refractory | Lo-D |
|---|---|---|---|---|---|---|---|---|---|
| Highest Recommended Service Temperature | 3000F | 2800F | 2500F | 2400F | 2600F | 2200F | 2000F | 3000F | 2500F |
| Pyrometric Cone Equivalent | 33 (1773F) | 30 (1602F) | 16 (1666F) | 15 (1615F) | 32½ (1755F) | 16-17 (1746F) | 14 (1522F) | 36 (1980F) | – |
| Weight | | | | | | | | | |
| As Placed | 148 pcf | 131 pcf | 138 pcf | 109 pcf | 103 pcf | 97 pcf | 96 pcf | 193 pcf | 100 pcf |
| Oven Dried at 220F | 134 pcf | 113 pcf | 116 pcf | 80 pcf | 80 pcf | 66 pcf | 67 pcf | 183 pcf | 48 pcf |
| After 5 hr Firing at 1750F | 130 pcf | 110 pcf | 110 pcf | 75 pcf | 75 pcf | 57 pcf | 63 pcf | 177 pcf | 44 pcf |
| Crushing Strengths After 5 hr Firing at | | | | | | | | | |
| 220F | 3500 psi | 700 psi | 1310 psi | 630 psi | 580 psi | 310 psi | 220 psi | 2920 psi | – |
| 1200F | 2680 psi | 560 psi | 1190 psi | 595 psi | 475 psi | 320 psi | 210 psi | 1760 psi | – |
| 1750F | 2350 psi | 300 psi | 780 psi | 490 psi | 545 psi | 375 psi | 220 psi | 1300 psi | – |
| 2000F | – | – | – | – | – | – | 320 psi | – | – |
| 2200F | 2490 psi | 580 psi | 1190 psi | 690 psi | 650 psi | – | – | 1690 psi | – |
| 2400F | 2950 psi | 1500 psi | 2130 psi | 1680 psi | 840 psi | – | – | 3850 psi | – |
| Linear Change After 5 hr Firing at | | | | | | | | | |
| 1200F | –0.2% | 0.0% | 0.0% | –0.2% | –0.1% | –0.1% | –0.2% | –0.2% | – |
| 1750F | –0.1% | 0.0% | –0.2% | –0.3% | –0.2% | –0.1% | –0.1% | –0.2% | – |
| 2000F | –0.1% | – | – | – | – | –0.1% | –0.1% | – | – |
| 2200F | –0.2% | 0.0% | –0.4% | –0.5% | –0.3% | – | – | –0.3% | – |
| 2400F | –0.7% | +0.6% | +1.6% | –2.4% | –0.8% | – | – | –0.5% | – |
| 2600F | –0.9% | +0.9% | – | – | – | – | – | –1.9% | – |
| 3000F | – | – | – | – | – | – | – | –3.1% | – |

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

**THERMAL CONDUCTIVITY**

| | MEAN TEMPERATURE, F | | | | | | |
|---|---|---|---|---|---|---|---|
| | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| 3X | – | 7.0 | 7.2 | 7.5 | 7.8 | 8.4 | 9.4 |
| H.T. | – | 4.45 | 4.76 | 5.08 | 5.41 | 5.74 | – |
| Std. | 4.16 | 4.34 | 4.59 | 4.88 | 5.19 | 5.52 | – |
| L.W. | 1.99 | 2.09 | 2.21 | 2.36 | 2.56 | 2.82 | – |
| CA Ins. | – | 2.57 | 2.70 | 2.90 | 3.12 | 3.33 | 3.65 |
| No. 20 | 1.43 | 1.54 | 1.65 | 1.76 | 1.87 | 1.98 | – |
| C-31 M | – | 6.0 | 6.1 | 6.3 | 6.5 | 6.7 | 6.9 |

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

**PACKAGING INFORMATION**

| | Pounds Required for 1 cubic foot | Packaging |
|---|---|---|
| 3X Firecrete | 139 | 100-lb bags |
| H.T. Firecrete | 110 | 100-lb bags |
| Standard Firecrete | 110 | 50 or 100-lb bags |
| L.W. Firecrete | 75 | 80-lb bags |
| CA Insulating Firecrete | 76 | 80-lb bags |
| CA 2200 Insulating Firecrete | 57 | 80-lb bags |
| No. 20 Firecrete | 58 | 80-lb bags |
| C-31 M Refractory Cement | 180 | 100-lb bags |
| Lo-D Firecrete | 44 | 50-lb bags |

**COMPLIANCE WITH GOVERNMENT SPECS**

Lo-D Firecrete complies with MIL-C-18794A

292570

# 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 applications 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.



292571

# BLAZECRETE
## Specification Data

| | 3X | STD. | L.W. | C-2 Cement |
|---|---|---|---|---|
| Highest Recommended Service Temperature | 3000F | 2400F | 2000F | 2300F |
| Pyrometric Cone Equivalent | 33 (3173F) | 16 (2669F) | 14 (2552F) | 18 (2768F) |
| Weight Slag Troweled: | | | | |
| As Placed | 148 pcf | 132 pcf | 104 pcf | 140 pcf |
| Oven Dried at 220F | 133 pcf | 116 pcf | 69 pcf | 125 pcf |
| After 5-Hr Firing at 1750F | 130 pcf | 110 pcf | 65 pcf | 120 pcf |
| Weight Gunned: | | | | |
| As Placed | 153 pcf | 134 pcf | 117 pcf | 142 pcf |
| Oven Dried at 220F | 142 pcf | 124 pcf | 76 pcf | 134 pcf |
| After 5-Hr Firing at 1750F | 140 pcf | 118 pcf | 73 pcf | 128 pcf |
| Crushing Strengths After 5 Hours Firing at: | | | | |
| 220F | 570 psi | 1350 psi | 275 psi | 5200 psi |
| 1200F | 700 psi | 1070 psi | 338 psi | 4700 psi |
| 1750F | 790 psi | 1130 psi | 400 psi | 2600 psi |
| 2000F | — | — | 481 psi | — |
| 2200F | 1840 psi | 1460 psi | — | — |
| 2400F | 2390 psi | 2870 psi | — | — |
| Linear Change After 5 Hours Firing at: | | | | |
| 1200F | 0.0% | −0.1% | −0.3% | −0.2% |
| 1750F | 0.0% | −0.4% | −0.5% | −0.2% |
| 2000F | — | — | −0.8% | −0.5% |
| 2200F | −0.2% | −0.5% | — | — |
| 2400F | −0.2% | −0.4% | — | — |

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

## THERMAL CONDUCTIVITY

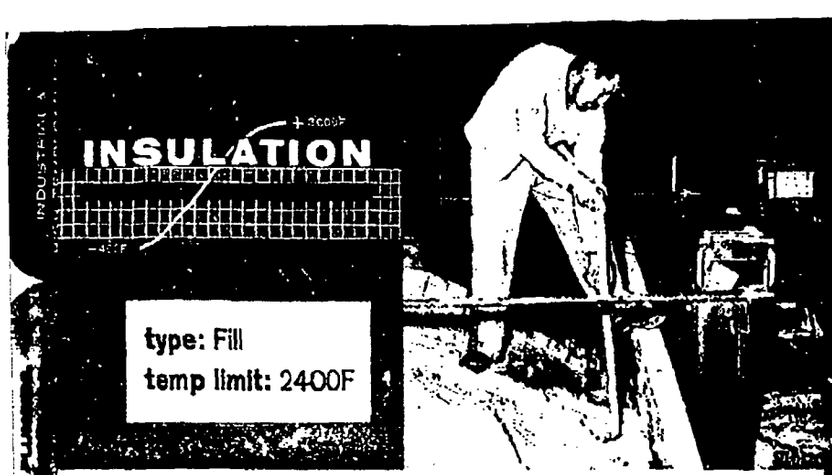
| | MEAN TEMPERATURE, F | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| 3X | — | — | 4.10 | 4.38 | 4.68 | 5.40 | 6.35 | 7.58 |
| Std. | — | 3.89 | 3.95 | 4.05 | 4.24 | 4.57 | 5.09 | — |
| L.W. | 1.42 | 1.52 | 1.64 | 1.76 | 1.89 | 2.01 | — | — |
| C-2 | — | — | 3.40 | 3.50 | 3.80 | 4.30 | 5.10 | 5.90 |

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

## PACKAGING INFORMATION

| | Pounds required for 1 cu ft | Packaging |
|---|---|---|
| 3X Blazecrete | 130 (slap-troweling)<br>140 (gunning) | 100 lb bags |
| Standard Blazecrete | 110 (slap-troweling)<br>118 (gunning) | 100 lb bags |
| L.W. Blazecrete | 65 (slap-troweling)<br>73 (gunning) | 80 lb bags |
| C-2 Refractory Cement | 120 (slap-troweling)<br>140 (gunning) | 100 lb bags |

292572




## J-M AGGREGATES AND FILLS

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

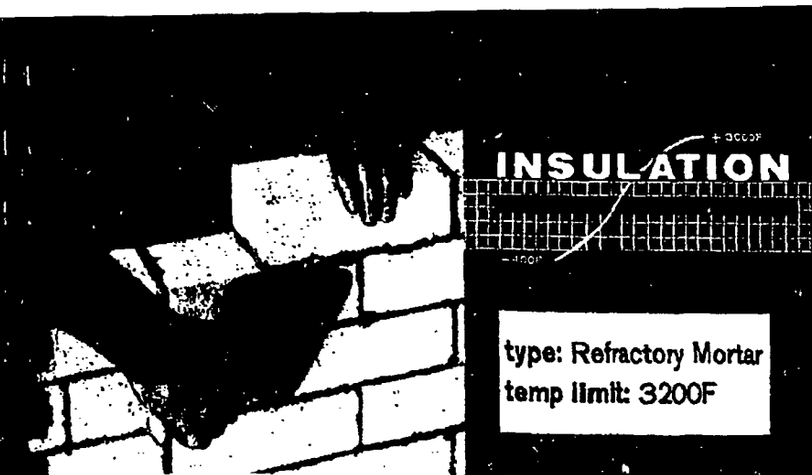
Zelie L.W. and JM-2400 L.W. Aggregates may be mixed with calcium aluminate cement to form an insulating refractory concrete for various operating conditions. Sil-O-Cel C-3 may be mixed with calcium aluminate or portland cement for lower temperature conditions. By selection of the aggregate, an insulating 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 L.W. Aggregate | al. silicate | 2400 | 50 | 80-lb bags |
| Zelie L.W. Aggregate | al. silicate | 2400 | 31 | 65-lb bags |
| Sil-O-Cel C-3 | calcined, coarse-graded diatomaceous silica | 2000 | 31 | 50-lb bags |
| Sil-O-Cel Insulating Powder | finely ground diatomaceous silica | 1600 | 17 | 50-lb bags |
| Sil-O-Cel Coarse Grade | similar to Sil-O-Cel Insulating Powder, but more coarsely ground | 1600 | 22 | 50-lb bags |



292573




## J-M BONDING MORTARS

**DESCRIPTION:** J-M Refractory Bonding Mortars are recommended for bonding together many relatively small units into a stable, strong, and gas-tight structure. The use of refractory mortars reduces slag or gas penetration and cuts down heat loss caused by open joints. There are two general classifications of bonding mortars: heat setting and air setting. Heat setting mortars will develop a bond only with the application of heat. Air setting mortars develop a strong bond without the application of heat.

J-M Bonding Mortars have been scientifically formulated to insure good workability, low shrinkage, and long shelf life.

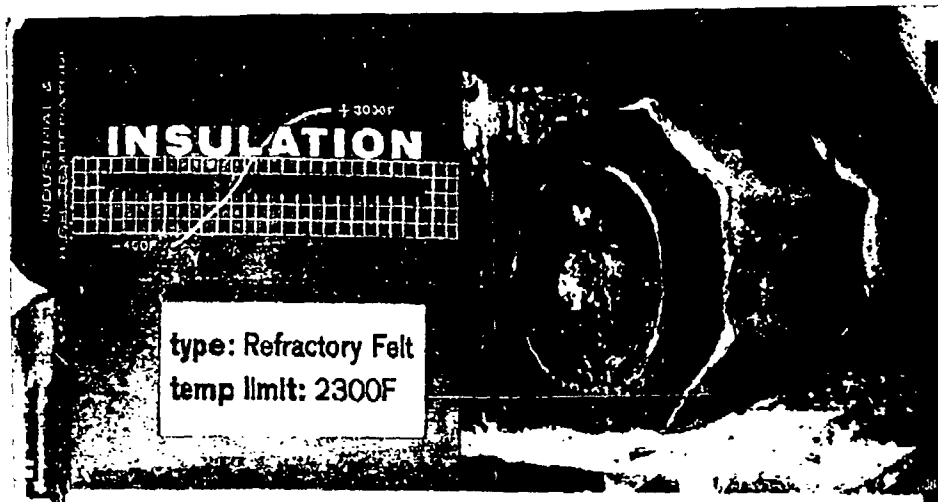
**AVAILABLE TYPES**

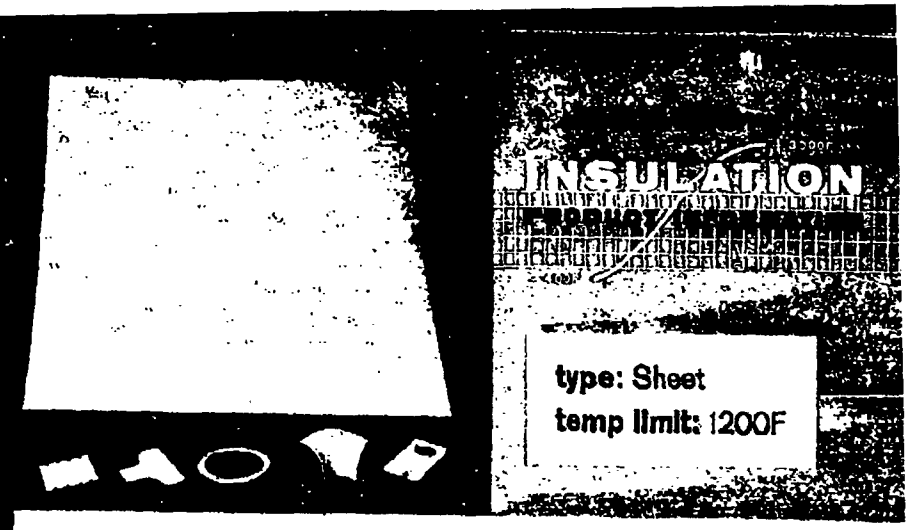
| Mortar | Type | Temperature Limit, F | Uses | Packaging |
|---|---|---|---|---|
| Blaktite® | air setting | 3200 | laying insulating fire brick or refractory brick; shallow patching hot or cold surfaces | 200, 100, 50, 25, 15, 10 and 5-lb containers |
| Super Blaktite® | air setting | 3000 | for coating over vertical industrial boiler tubes, shallow patching, laying brick | 200, 100 and 50-lb containers |
| Heliite® | air setting | 3000 | laying fire brick; shallow patching | 200, 100 and 50-lb containers |
| No. 20 | air setting | 2700 | laying fire brick | 200, 100, 50, 25, 15, 10 and 5-lb containers |
| No. 26 | air setting | 2600 | laying fire brick; patching | 100-lb bags |
| No. 31 | (coarse) heat setting | 3100 | laying fire brick | 100-lb bags |
| No. 32 | (fine) heat setting | 3100 | laying fire brick | 100-lb bags |





292574




## 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 available in loose form (J-M CERAFIBER) in 25-lb bags.

**USES:** Recommended for a great variety of high temperature industrial applications such as insulation protection in repairing open hearth roofs; on cover-type annealers to fill openings for electrical access; expansion joints in kilns, furnaces and boiler walls.

### ADVANTAGES

**High Heat Resistance**

Will withstand continuous exposure to a full 2300F.

**Low Thermal Conductivity**

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

**Light Weight**

Weighs 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 per cu ft | MEAN TEMPERATURE, F 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|---|---|---|---|---|---|---|---|---|
| 3 | .40 | .48 | .57 | .68 | .80 | .93 | 1.08 | 1.25 |
| 4 | .38 | .44 | .52 | .61 | .71 | .82 | .94 | 1.07 |
| 6 | .36 | .41 | .47 | .54 | .62 | .70 | .79 | .89 |
| 8 | .34 | .39 | .45 | .51 | .57 | .64 | .72 | .81 |
| 10 | .33 | .38 | .43 | .49 | .55 | .61 | .68 | .76 |
| 12 | .33 | .37 | .42 | .47 | .53 | .59 | .65 | .72 |
| 14 | .33 | .37 | .41 | .46 | .51 | .57 | .63 | .69 |
| 16 | .32 | .36 | .40 | .45 | .50 | .55 | .60 | .65 |
| 24 | .31 | .35 | .39 | .44 | .48 | .53 | .58 | .62 |

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

### STANDARD DENSITIES AND THICKNESSES

| Type | Density*, lbs per cu ft | Available Thicknesses,* Inches 1/2 | 5/8 | 3/4 | 7/8 | 1 | 1 1/8 | 1 1/4 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| CRF-300 | 3 | | | | O | O | O | O | X | X |
| CRF-400 | 4 | | | O | O | O | O | O | X | |
| CRF-600 | 6 | | | O | O | O | O | X | X | |
| CRF-800 | 8 | O | O | O | O | O | O | X | | |
| CRF-1000 | 10 | X | X | X | X | X | X | X | | |
| CRF-1200 | 12 | X | X | X | X | X | X | X | | |
| CRF-1400 | 14 | X | X | X | X | X | X | | | |
| CRF-1800 | 18 | X | X | X | X | X | | | | |
| CRF-2400 | 24 | X | X | X | X | X | | | | |

*Other thicknesses and densities available on request
O denotes availability of 4' and 8' sheets and 26' rolls
X denotes availability of 4' and 8' sheets only
Standard width is 42 inches



292575

## 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.

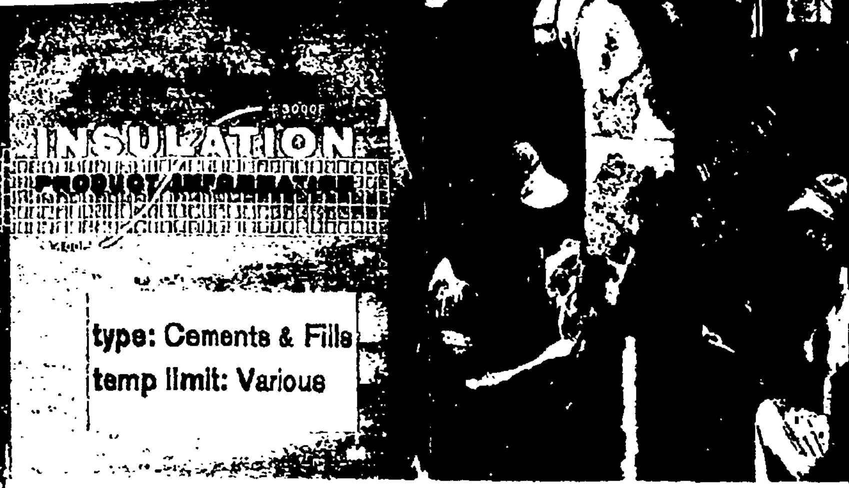
### THICKNESSES, TOLERANCES AND WEIGHTS*

| Thickness, Inches | Tolerances, Inches ± | Lbs per 42" x 48" sheet No. 106, 102 and "C" Grade | No. 219 |
|---|---|---|---|
| 1/32 | 0.007 | 2.5 | 1.5 |
| 1/16 | 0.008 | 3.5 | 2.5 |
| 3/32 | 0.008 | 4.5 | 3.4 |
| 1/8 | 0.008 | 6.0 | 4.4 |
| 5/32 | 0.009 | 7.0 | 5.8 |
| 3/16 | 0.014 | 9.0 | 7.5 |
| 1/4 | 0.015 | 11.5 | 9.2 |
| 5/16 | 0.016 | 13.3 | 11.1 |
| 3/8 | 0.025 | 17.5 | 15.0 |
| 7/16 | 0.029 | 21.4 | 18.7 |
| 1/2 | 0.034 | 25.2 | 22.4 |
| 5/8 | 0.045 | 32.5 | 30.3 |

*Actual weights may vary plus or minus 10 percent.



292576




## J-M CEMENTS & FILLS insulating & finishing

**DESCRIPTION:** Johns-Manville Insulating and Finishing Cements have been produced for use with J-M insulating materials. The Insulating Cements are ideal for insulating irregular surfaces where it would be impracticable to apply pipe or block insulation. Finishing Cements are used to give insulation a hard, smooth finish which can be painted or weatherproofed. J-M Insulating Fills are recommended for use in filling irregular spaces.

**AVAILABLE TYPES:**

FINISHING CEMENTS

**No. 301 Cement** A hydraulic-setting, insulating and finishing cement especially designed for one-coat application. Because of extremely low drying shrinkage, it hardens in a few hours to a smooth, crack-free surface. It may be painted with a water-base paint as soon as firm, thus permitting completion of job in one operation. Recommended for insulating small steel pipe fittings and as a finish over block insulation.

**No. 302 Cement** A high grade, long fiber, asbestos cement.

**No. 352 and 0352 Cements** General purpose, all asbestos fiber cements with good troweling and finishing properties. Generally used as a finish over block insulation and for general utility applications.

INSULATING CEMENTS

**85% Magnesia Cement** For use with 85% Magnesia pipe and block insulation for patching, pointing up joints, and covering irregular shapes.

**Superex Insulating Cement** For use with Superex or Thermobestos pipe and block insulation for patching, pointing up joints, and covering irregular shapes.

**No. 450 Cement** A mineral wool cement with excellent adhesion qualities on both hot and cold surfaces. A good insulator, compared with other types of cements, it can be applied in heavy layers. No. 450 contains a rust inhibitor to minimize rusting of metal with which it may come in contact.

**No. 500 Cement** An expanded vermiculite cement recommended for specialized uses in the metal producing industries. Effectively seals against air infiltration. Particularly adapted to gun application.

INSULATING FILLS

**Fibrofil®** A mixture of diatomaceous silica and long fiber asbestos. Due to the asbestos fiber, this material has certain characteristics which differ from those of ordinary powdered fills. The fibers offset any tendency to settle or filter through cracks, making the material well adapted for use as a fill on gas generator sets, etc.

**Fil-Insul®** An insulating fill for use in irregular spaces where block or brick insulations are not practicable and where a high-grade resilient fill is needed. Fil-Insul will permit considerable expansion and contraction because of its fibrous nature which also serves to prevent any settling or sifting through cracks.



292577

## INSULATING & FINISHING CEMENTS AND FILLS
### Specification Data

PHYSICAL PROPERTIES

| | Finishing Cements | | | | Insulating Cements | | | | Fills | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 301 | 302 | 352 | 0352 | 85% Magnesia | Superex | 450 | 500 | Fibrofil | Fil-Insul |
| Packaging (lbs per bag) | 50 | 50 or 100 | 50 or 100 | 50 or 100 | 25 | 50 | 50 | 50 | 80 | 65 |
| Temperature Limit | 1400F | 1800F | 1000F | 1000F | 600F | 1900F | 1800F | 1800F | 1800F | 1000F |
| Coverage per 100 lbs Applied & dried 1" thick | 36 sq ft | 25 sq ft | 18 sq ft | 19 sq ft | 55 sq ft | 45 sq ft | 50 sq ft | 78 sq ft | — | — |
| Approximate Ratio water to mix per 100 lbs | 15 gals | 21 gals | 12 gals | 12 gals | 42 gals | 30 gals | 30 gals | 36 gals | — | — |
| Density, Dry | 18 pcf | 20 pcf | 28 pcf | 30 pcf | 20 pcf | 12 pcf | 8 pcf | 10 pcf | 18 pcf (packing) | 15 pcf (packing) |
| Base Material | hydraulic setting cement | asbestos | asbestos | asbestos | mag. carbonate | diatomaceous silica | mineral wool | expanded vermiculite | diatomaceous silica & asbestos fiber | mineral fiber |
| Color | light gray dries white | light gray | gray | gray | white | light brown | gray | golden gray | — | — |

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

THERMAL CONDUCTIVITY

| | Mean Temperature, F | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| No. 301 | — | .85 | .86 | .87 | .88 | .90 | .91 | .93 | .95 |
| No. 302 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| No. 352 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 |
| No. 0352 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 |
| No. 450 | .67 | .72 | .76 | .81 | .86 | .91 | .96 | .99 | 1.01 |
| No. 500 | .74 | .79 | .83 | .88 | .92 | .98 | 1.02 | 1.06 | 1.11 |
| 85% Magnesia | .51 | .54 | — | — | — | — | — | — | — |
| Superex | .75 | .77 | .79 | .82 | .84 | .86 | .89 | .91 | .94 |
| Fibrofil | .59 | .61 | .62 | .63 | .65 | .66 | .68 | .69 | .70 |
| Fil-Insul | .53 | .58 | .64 | .70 | .76 | .83 | .91 | — | — |

CONDUCTIVITY: BTU IN PER SQ FT PER F PER HR

COMPLIANCE WITH GOVERNMENT SPECS

Navy 450 Cement meets MIL-C-2861, MIL-C-158 and HH-I-00580, Type III.

85% Magnesia Cement meets HH-I-00580, Type I.

Superex Cement meets HH-I-00580, Type V.

352 Asbestos Cement meets MIL-C-2906.

### SHORT FORM SPECIFICATIONS

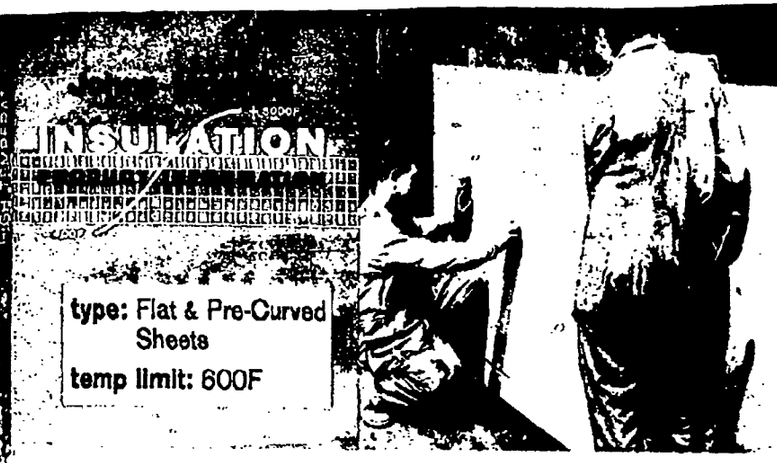
FINISH OVER BLOCKS

Asbestos cement (J-M No. 352, 0352 or 302) in two coats, or hydraulic setting cement (J-M No. 301) in one coat, shall be applied over hexagonal wire mesh stretched tightly over blocks and securely wired in place. The first coat of asbestos cement shall be left rough and allowed to dry thoroughly before applying second coat. Second coat of asbestos cement shall be mixed 2 to 1 by weight with portland cement and troweled smooth. Insulating cement (J-M No. 450) may be substituted for first coat in lieu of asbestos cement.

VALVES, FITTINGS AND FLANGES

On piping 4" and larger, valves, fittings and flanges shall be insulated with pipe or block insulation of same material fabricated in sections, or pieces wired in place, and finished with a filling and smoothing coat of asbestos cement. On pipe sizes smaller than 4" insulating cement (J-M No. 450) shall be used with an asbestos cement (J-M No. 352, 0352 or 302) finish. J-M No. 301 shall be applied in one coat over small pipe fittings.

292578




# 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.



292579

292580

# ASBESTOCITE
## Specification Data

| | |
|---|---|
| Density, Dry | 85 lbs per cu ft minimum |
| Normal (75 F, 50% RH Moisture Content (of dry weight) | 7% |
| Water Absorption (of dry weight after 24 hrs immersion) | 22% max. |
| Transverse Strength, Dry (modulus of rupture) | |
| Long direction of sheet | 5500 psi |
| Short direction of sheet | 4000 psi |
| Modulus of Elasticity, Dry (transverse) | 1.8 x 10⁶ psi |
| Compressive Strength, Normal** | 14,000 psi |
| Tensile Strength, Normal | |
| Long direction of sheet | 2350 psi |
| Short direction of sheet | 1710 psi |
| Screw Holding Strength, Normal (withdrawal load of type A, Mrs. 8-32 sheet metal screws) | 1/8" thickness—50 lbs per screw; 3/16" thickness—75 lbs per screw; 1/4" thickness—100 lbs per screw |
| Brinell Hardness No., Dry (500 kg load, 10 mm ball, 10 sec) | 18 |
| Flexibility, Normal (minimum bending radius) | |
| Long direction of sheet | 1/8" thickness—38 inches; 3/16" thickness—38 inches; 1/4" thickness—60 inches |
| Short direction of sheet | 1/8" thickness—30 inches; 3/16" thickness—34 inches; 1/4" thickness—12 inches |
| Moisture Change (in./in.) | |
| Shrinkage—normal to dry | 0.0022 |
| Expansion—normal to 90% RH | 0.0008 |
| Expansion—dry to saturated | 0.0030 |
| Maximum Service Temperature (soaking heat) | 600F |

*The figures given for the specified properties of standard Asbestocite are average values obtained in accordance with accepted test methods. Strength figures must be modified by applying adequate factors of safety to assure it working values.

**"Normal" refers to normal moisture content.

**COMPLIANCE WITH ASTM AND GOVERNMENT SPECS**

Asbestocite meets the American Society for Testing Materials' Specification C220-53T, Type F (Flexible), as well as Federal Specification SS-S-283a, Type F (Flexible) and Type U (Utility)

**FIRE UNDERWRITERS' APPROVAL**

Underwriters' Laboratories, Inc., approve J-M Asbestocite as being incombustible. Their tests show that Asbestocite, when used as a protective covering or as a structural material, will not contribute fuel to a fire, will not permit the spread of flame over its surface, and will not generate objectionable smoke. This is the best possible guarantee of Asbestocite's fire safety for any industrial application.

**STANDARD SIZES AND TOLERANCES**

| Thickness, Inches | Standard Sheet Size*, feet | | | |
|---|---|---|---|---|
| 1/8 | 4 x 4 | 4 x 8 | 4 x 10 | 4 x 12 |
| 3/16 | 4 x 4 | 4 x 8 | 4 x 10 | 4 x 12 |
| 1/4 | 4 x 4 | 4 x 8 | 4 x 10 | 4 x 12 |
| 3/8** | – | 4 x 8 | – | – |
| 1/2** | – | 4 x 8 | – | – |

*Pre-curved Asbestocite is furnished in 1/8" and 3/16" thicknesses in 4' x 4' and 4' x 8' sheet sizes in 64 diameters from 3' to 18'. For information on ordering consult your nearest J-M representative

**Available from West Coast plant only.

**DIMENSIONAL TOLERANCES**

| | Length, Inches | Width, Inches | Thickness, Inches |
|---|---|---|---|
| Flat | ±1/8 | ±1/8 | ±1/8 |
| Pre-curved | ±1/4 | ±1/4 | ±1/8 |

**type:** Protective Coating
**temp limit:** 250F

# J-M INSULKOTE® weather protective coatings and reinforcing mesh

**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:

**Insulkote ET*** A non water-vapor barrier, non-burning, weatherproof coating for use over insulation where "breathing" is required.

**Insulkote ST* and SG**** Weatherproofing and vapor barrier coatings for insulations on refrigerated equipment. Insulkote SG is an excellent anti-corrosion coating.

**Insulkote SGC***** A combination purpose coating which insulates and protects against weather and corrosive atmospheric conditions, and will prevent condensation under moderate 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

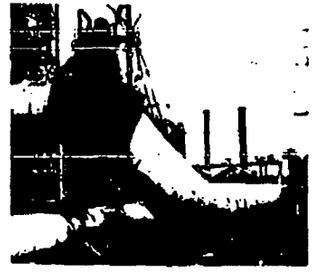
Years of service in the field have shown that Insulkote resists acid or alkaline atmospheres and will stand up under the most adverse weather conditions. Its composition minimizes surface cracking and crazing under sudden temperature changes. A jet black material, it will not fade after it is applied—patches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

### Easily Applied

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

## REINFORCEMENT

Furnished as an accessory item, Duramesh® Fabric Type 931 is an open mesh fabric made from continuous filament glass yarns and coated with asphalt. It is recommended as a reinforcing agent for use with Insulkote weather protective coatings.



J-M Duramesh reinforcing is easily applied to both irregular and even contours. High tensile strength of glass fiber yarn in Duramesh helps to prevent cracking or checking of Insulkote.



292581

# INSULKOTE
## Specification Data

| Type | Insulkote ET emulsion trowel | Insulkote Primer E emulsion brush | Insulkote ST solvent trowel | Insulkote SG solvent gun** | Insulkote Primer S solvent brush | Insulkote SGC solvent trowel or gun** |
|---|---|---|---|---|---|---|
| Application | | | | | | |
| Weight per gal | 10 lbs. | 8.4 lbs | 9.5 lbs | 9.5 lbs | 8.5 lbs | 7 lbs |
| Coverage as applied | 16 gal per 100 sq ft ¼" thick | 75 sq ft per gal | 8 gal per 100 sq ft ¼" thick | 8 gal per 100 sq ft ¼" thick | 100 sq ft per gal | 16 gal per 100 sq ft ¼" thick |
| Percent shrinkage (estimated) | 50 | 50 | 25 | 25 | 25 | 20 |
| Water vapor permeability in perms —for recommended thickness | .2 to .5 | — | .0 to .1 | .1 to .2 | — | — |
| Temperature use range | 100 to 250F | 100 to 250F | up to 250F | up to 250F | up to 250F | up to 250F |

Code: E—emulsion type; S—solvent type; T—trowel consistency; S—spray gun consistency; G—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 must be provided where material is used in enclosed spaces.

## PACKAGING INFORMATION

**INSULKOTE**

Available in 5 gallon pails, and 30 or 55 gallon drums.

**DURAMESH**

Available in 150 foot rolls in the following widths: 2", 3", 4", 6", 9", 11.5", 12", 15", 18", 23", 36" and 45".

## APPLICATION RECOMMENDATIONS

**INSULKOTE ET** On asbestos cement no primer is required, but cement should be dry and hexagonal wire mesh reinforcement used. Coating should be troweled on to a thickness of approximately ¼", and care should be taken to see that it is forced through the mesh so as to make a good bond with the cement. The mesh should not be exposed to the weather at any point.

On mineral fiber insulations, Insulkote Primer E should be applied, and Insulkote ET troweled on while the primer is still tacky. Wire mesh reinforcement is not required except where movement or vibration may occur.

**INSULKOTE ST** When applied on dry asbestos cement no primer is required, but hexagonal wire mesh reinforcement should be used. Troweling should be done firmly to make sure the coating is thoroughly forced through the mesh. Insulkote ST should not be applied in thicknesses greater than ⅛". Application to a greater thickness may cause slumping while there is still solvent in the coating.

On mineral fiber insulations, Insulkote Primer S should be applied prior to application of Insulkote ST. Wire mesh reinforcement is not required except where movement or vibration may occur.

**INSULKOTE SG** On asbestos cement no primer is required, but wire mesh reinforcement should be used except under certain conditions where it may be desirable to substitute a glass fabric Duramesh reinforcement. In the latter case, a coating of Insulkote SG, approximately 1/16" thick, shall be sprayed on the surface to be covered, and the glass fabric rolled or pressed into this coating. A second coat of Insulkote SG shall then be sprayed on to give a total wet thickness of approximately ¼".

When used as metal protection, no primer or wire reinforcement is required. Metal must be clean and dry at time of application.

When used on mineral fiber insulations, a coat of Insulkote Primer S should be sprayed on before applying the Insulkote SG.

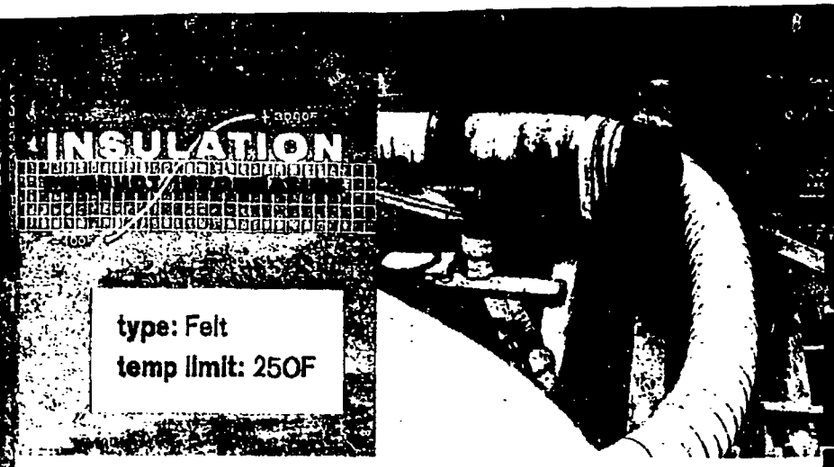
**INSULKOTE SGC** This coating is furnished in consistencies suitable for spray gun or trowel application. In either case, the metal to which the coating is to be applied must be clean and dry. To build up a thickness of ¼" by spray gun, the compound should be applied in two equal ⅛" coats.

NOTE: If a finish of lead and oil paint is desired, the Insulkote (except in the case of Insulkote ET, where primer is not recommended) should be allowed to dry thoroughly and then painted with aluminum paint or similar.

292582



*An Insulation for Every Commercial and Industrial Purpose*




# J-M WEATHERPROOFING JACKETS

**DESCRIPTION:** Johns-Manville produces a complete line of weatherproofing jackets for every hot and cold insulation requirement. Most are made from asbestos felts which are saturated and coated with asphalt. These jackets, in various thicknesses and weights, may be used for fire protection as well as weatherproofing purposes.

**AVAILABLE TYPES:**

**Double Coated Flexstone®** An asphalt-saturated asbestos felt coated with a mineral-filled asphalt. Designed for long life and extra heavy weatherproofing. Will not embrittle under prolonged exposure to sunlight. Supplied in rolls 36 in. wide, each roll containing 1 square and weighing 50 lbs.

**Asbestos Firetard®** A weatherproofing jacket designed for use where resistance to the spread of fire is of primary importance. Firetard is a lamination of heavy asphalt-saturated felt and plain asbestos felt, and affords excellent insulation protection. Because the unsaturated asbestos is incombustible, it prevents flame from travelling along the surface of an insulated pipe line. Supplied in rolls 32 in. wide, each roll containing 1 square and weighing 55 lbs.

**No. 50*** An asphalt-saturated asbestos felt jacket designed for medium long life. Supplied in rolls 36 in. wide, each roll containing 2 squares and weighing 32 lbs per square.

**No. 7700** An asphalt-saturated and coated asbestos felt with a smooth outer surface. Good weatherproofing jacket designed to be given a field coating of asphalt. Supplied in rolls 32 in. wide, each roll containing 2 squares weighing 35 lbs each.

**No. 15-A*** A lightweight asphalt-saturated asbestos finishing felt. Supplied in rolls 36 in. wide, each roll containing 3 squares and weighing 15 lbs per square.

**White Surface Asbestos** 3-ply asbestos felt consisting of two inner layers asphalt-saturated and one outer layer unsaturated. Features fire resistance and medium life. Supplied in rolls 32 in. wide, each roll containing 1 square and weighing 53 lbs.

**No. 45-A*** Asphalt-saturated asbestos felt with a sand finish. A heavy, long life weatherproofing jacket supplied in rolls 36 in. wide, each roll containing 1 square and weighing 42 lbs.

**No. 55-R*** Asphalt-saturated and coated organic felt. Heavy weatherproofing jacket supplied in rolls 36 in. wide, each roll containing 1 square and weighing 55 lbs.

**No. 45-R*** Asphalt-saturated and coated organic felt for medium weatherproofing protection. Supplied in rolls 36 in. wide, each roll containing 1 square and weighing 45 lbs.

**No. 30-R*** Asphalt-saturated organic felt for light weatherproofing protection. Supplied in rolls 36 in. wide, each roll containing 2 squares and weighing 30 lbs per square.

**No. 15-R*** Asphalt-saturated organic felt which gives very light protection against weather. Supplied in rolls 36 in. wide, each roll containing 4 squares and weighing 15 lbs per square. (Note: This felt when furnished by Pittsburg, Cal., plant comes in rolls containing 3 squares.)

**Available perforated.*



292583

**ACCESSORIES:**

With all factory-applied jackets enough 16 gauge galvanized wire and J-M Laptite® asphalt-plastic cement to seal joints will be furnished. In addition, a butt strip of the same jacket material, 7 in. wide and having the same circumferential length as the jacket, will also be supplied.

**USES:** Especially recommended for weather proofing insulated outdoor piping and small diameter equipment.

**ADVANTAGES:**

**Wide Jacket Selection**

Eleven different jackets give user a choice to meet every requirement.

**Factory Applied**

All J-M weatherproofing jackets can be furnished factory-applied thus eliminating the necessity of separate application at the job site.

## COMPLIANCE WITH GOVERNMENT SPECS

No. 15-A perforated or unperforated complies with HH-F-185, Type I perforated, Class A and Type II plain, Class A.

No. 15-R complies with HH-F-191a, Type I.

No. 30-R complies with HH-F-191a, Type II.

No. 15-R (from Waukegan plant only) complies with HH-F-201, Type I.

**FACTORY-APPLIED JACKETS FOR EVERY PURPOSE...**

In addition to its line of weatherproofing jackets, Johns-Manville manufactures jacketing materials for every commercial and industrial purpose. These materials, which include kraft paper, canvas, asphalt felts, asbestos felts, and aluminum, can be furnished factory-applied to J-M Thermobestos calcium silicate pipe insulation. The felts, paper and canvas can also be factory-applied to J-M 85% Magnesia and J-M Superex-II pipe insulations. All can be supplied in roll form for large area protection or for field application.

## SHORT FORM SPECIFICATIONS

**WEATHERPROOFED OUTDOOR PIPING** "All outdoor pipe insulation shall be finished with a weatherproof jacket of_____ (fill in name). All joints shall be lapped at least 3", horizontal joints lapping downward to shed water. Longitudinal laps on vertical pipe shall be sealed with J-M Laptite. All other joints shall be left unsealed.

"The jacket shall be secured with loops of No. 16 galvanized wire applied on not greater than 4" centers, or ½" x 0.015" corrosion-resistant metal bands and clips applied on not greater than 6" centers, with one loop on each end lap, or two on each 7" butt strip."

**WEATHERPROOFED FITTINGS** "On pipe bends, fittings and flanges, the jacket shall lap about 4" over the mastic-type weatherproofing." Note: See data sheet on J-M Insulkote® weather protective coatings for specifications on bends, fittings and flanges.

**FIRE PROTECTION** "Where fire hazard must be considered due to the fact that flame may be carried along exposed piping when fire occurs adjacent to such lines, a fire-retarded weatherproof jacket of Asbestos Firetard shall be applied."

**UNDERGROUND PIPING** "All pipe insulation in underground tunnels or conduits shall be protected from water submersion with a No. 50 asbestos weatherproof felt, perforated. All joints shall be lapped about 1½" and left unsealed. Longitudinal laps shall be located on top of pipe to permit ready escape of steam after submersion."

292584

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.



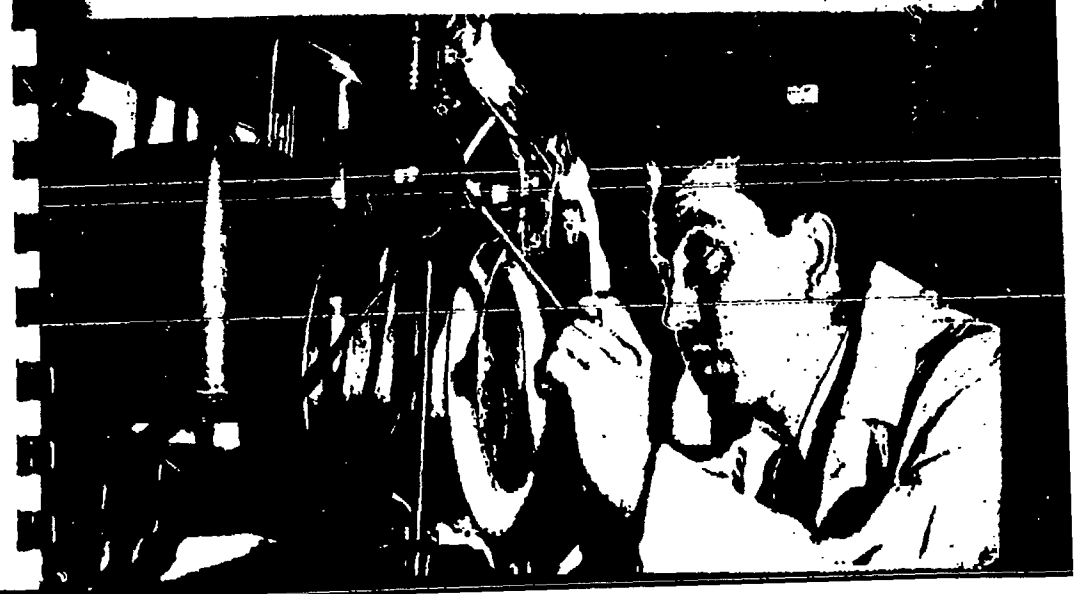
292585

## Johns-Manville INSULATION RESEARCH...

### the secret of J-M insulation progress

The Johns-Manville Research Center, located at Manville, New Jersey, contains the world's largest and most completely equipped laboratories devoted to the study of insulations and allied products for all temperature ranges encountered in modern industry. Here a staff of hundreds—including organic and inorganic chemists, physicists, geologists, metallurgists, and mechanical, mining, electrical, civil and chemical engineers—is engaged in research and development.

Working with the most advanced laboratory equipment, these scientists devote their efforts to the development of new insulating products and the improvement of existing ones. In addition, they carry out insulation research assignments related to specific customer problems. This broad research program plays a major part in Johns-Manville's ability to offer exactly the right insulation... the most economical and efficient ... for any equipment or operating temperature.



**Alpha Systems**
*Microfilming Specialists*
458 Pike Road
Huntingdon Valley, PA 19006
(215) 322-8100

# MICROFILM CERTIFICATE

Dechert Price & Rhoads
COMPANY

Spec. 7065 DR

The microfilming of official records, designated below, in the offices of the identified herein, is true and correct and same is performed as prescribed by the custodian of records.

The following records are hereinafter microfilmed for preservation, relating to substitution of microfilm for the original record in the interest of economy and conservation of space, in accordance with the Uniform Photographic Copies of Business and Public Records As Evidence Act.

| RECORD DESCRIPTION | BEGINNING | ENDING |
|---|---|---|
| Brochures | Johns Manville. Insulation Product Information 4A | |

Lauer

ROLL 4

DATE 9/17/87

CART. COLOR