PLAINTIFF'S EXHIBIT

DUP-3016

THORPE PRODUCTS COMPANY

DIVISION OF J T THORPE COMPANY

DISTRIBUTORS OF INDUSTRIAL INSULATION

P. O. BOX 33399 644-2391 HOUSTON, TEXAS 77033

July 19, 1972

Mr. D. S. Meaden
SHELL OIL COMPANY
P. O. Box 2633
Deer Park, Texas 77536

Subject: OSHA Asbestos Dust Standard
Effective July 7th, 1972

Thorpe has had many requests for information regarding compliance with these new standards and in regard to asbestos containing insulating materials which we are furnishing to industry.

This letter is to make available to you our latest information and to offer any assistance possible where and when needed to assist you in compliance.

Attached is a copy of a news release from the U. S. Department of Labor which summarizes this new standard.

Also attached is a listing by type of material stocked or fabricated by Thorpe. Those having dry asbestos as a component are marked with an asterisk. Those most commonly used by industry are those included under Class I - Calcium Silicate and High Temperature Insulation.

We have taken steps to eliminate asbestos from all products which we stock and fabricate. By January 1st, 1973, we expect to have a new pipe covering produced by Johns-Manville which will have the same or better properties as Thermobestos but will contain no Asbestos or free Silica.

Until we have this new product we offer the following suggestions for compliance:

I. Eliminate all field fabrication of Asbestos products. When frequent removal of insulation is required, Thorpe can furnish prefabricated Thermobestos covers or completely incapsulated removable metal covers.

LAM 005403

continued .....

DPMC-02999

Elbows can be insulated by the use of:

A. Prefabricated or factory molded covers
B. Aluminum covers filled with asbestos free insulating cement
C. Zeston PVC covers with 1000° Fiberglas filler
D. Zeston PVC covers with asbestos free insulating cement

II. Where cutting is required, the use of a respirator such as Safe-line Products No. 5441 Mask with No. 5905 Filter or any respirator carrying the U. S. Bureau of Mines Approval No. 21B-81.

III. Use substitute materials containing no asbestos as follows:

A. Microlok Fiberglass Pipe Covering to 500° F
B. Mineral Fiber Pipe Covering to 1200° F
C. Ceramic Fiber to 2300° F

Thorpe is currently monitoring its operation with the use of Micronair Personnel Air Samplers Catalog No. 3900-10 as produced by the Bendix Corporation and carrying OSHA Approval No. 1A-102. Dust analysis can be made by Shilstone Testing Laboratories, Houston, Texas.

We have made extensive provisions for dust collection in our warehouses and fabrication facilities. Our cutting equipment have the most effective collection attachments that we can obtain. You are welcome to visit our Houston facility at any time. Arrangements can be made through the writer.

CAUTION: When considering Asbestos Free products, be sure also that they contain no Free Silica. Manufacturers will generally offer this information in writing.

The enclosed information is fragmentary. Please call us for additional information or assistance. Copies are available for your Safety Department or person responsible for OSHA compliance.

We appreciate your business and hope that the enclosed information will be beneficial to you and will help us earn your continued trust and confidence in our services.

THORPE PRODUCTS COMPANY

M. P. Proctor

MPP:pb

Enclosure

LAM 005404

COPY OF NEWS RELEASE
U. S. DEPARTMENT OF LABOR
OFFICE OF INFORMATION, WASHINGTON, D.C.

FOR RELEASE: IMMEDIATE, WEDNESDAY, JUNE 7, 1972

OSHA ESTABLISHES NEW STANDARD FOR EMPLOYEE EXPOSURE TO ASBESTOS DUST

A new standard for employee exposure to asbestos dust, limiting concentrations to 2 fibers, which are longer than 5 micrometers, per cubic centimeter of air on a time-weighted average, effective July 1, 1976, was announced today by the Occupational Safety and Health Administration (OSHA).

The current permissible time-weighted average concentration of 5 fibers of asbestos longer 5 micrometers, established originially in an emergency temporary standard last December 7, will be continued until July 1, 1976.

The standard also establishes a ceiling concentration of 10 fibers, not to be exceeded at any time.

George C. Guenther, Assistant Secretary of Labor for OSHA, said the new standard was adopted after consideration of recommendations from the National Institute for Occupational Safety and Health (NIOSH) of the Department of Health, Education, and Welfare; of the OSHA Advisory Committee on Asbestos Dust, and of comments from interested persons, including presentations in a four-day public hearing.

The new standard provides the following:

Acceptable Concentrations -- As of July 1, 1976, time-weighted average concentrations of asbestos fibers longer than 5 micrometers will not be allowed to exceed 2 fibers per cubic centimeter of air. The current time-weighted average concentrations of 5 fibers will be permitted until July 1, 1976.

METHODS OF COMPLIANCE -- Feasible technological controls and appropriate work practices are required as the primary means of compliance. Rotation of employees to reduce their exposures is allowed only in "exceptional circumstances". Personal protective equipment, such as respirators, cannot be relied upon, in large part because such devices are so uncomfortable as to be burdensome except for short periods.

The standard includes these other compliance requirements:

-- Hand tools that may produce or release asbestos fibers in excess of the limits must be provided with local exhaust ventilation systems.

LAM 005405

-- Insofar as practicable, asbestos must be handled, mixed, applied, removed, cut, scored or otherwise worked in a wet state to reduce fiber emissions unless this would diminish the usefulness of the product.

-- No asbestos cement, mortar, coating, grout, plaster or similar material containing asbestos can be removed from shipping bags or other containers without being either wetted, enclosed or ventilated.

-- Where respirators are permitted, they must be selected from among the

types approved by the Bureau of Mines or NIOSH. Extensive details are given on types of respirators and conditions for their use. No employee may be assigned to a task requiring a respirator if a physician determines it would affect his job functioning or his health.

-- The employer must provide and require the use of special protective clothing, change rooms, and two separate lockers for the employees street and work clothes. The employer also must exercise care in laundering and other handling of contaminated clothing.

-- External work area surfaces must be kept free of excessive accumulations of asbestos fibers. Waste must be collected in sealed, impermeable bags or other such containers.

MONITORING -- Employers must establish monitoring systems to make certain every employee's exposure to asbestos fiber is below the prescribed limits. If the limits are exceeded, the employer must undertake a compliance program. Therefore, the standard also requires monitoring at intervals no longer than 6 months and gives employees or their representatives the opportunity to observe the monitoring and to have access to such records.

WARNING SIGNS -- Caution signs are to be displayed in areas where asbestos concentrations may exceed the exposure limits. Caution labels must be affixed to all raw materials, mixtures, scrap, waste, debris and other products containing asbestos fibers, or to their containers. However, no label is required where asbestos has been modified by a bonding agent, coating, binder or other material that would prevent release of above-limit concentrations.

RECORDKEEPING -- Employers must maintain records of personal or environmental monitoring, keep them for at least 3 years, and make them available upon request to OSHA or NIOSH. Every current and former employee is given opportunity for reasonable access to any records indicating their exposure to asbestos dust. Any employee found to have been exposed at any time to airborne concentrations in excess of the limits must be notified in writing no later than 5 days after the finding, and informed as to corrective action being taken.

MEDICAL EXAMINATIONS -- The employer must provide, or make available at his cost, medical examinations. Within 30 days of an employee's first employment in a job involving asbestos exposure, the employer must provide a comprehensive medical examination, including a chest X-ray and pulmonary tests. By January 31, 1973, and at least annually thereafter, every employer shall provide or make available comprehensive medical examinations to employees in asbestos exposure areas. A similar examination is to be provided within 30 days before or after termination of employment.

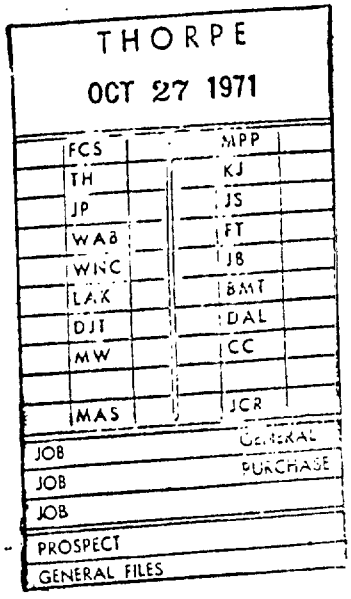
MEDICAL RECORDS -- Employers whose employees have been examined under the standard must maintain complete records of these examinations and retain them for at least 20 years. The contents of the records are to be made available for inspection and copying to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, authorized physicians and medical consultants of either agency, and, upon request of an employee or former

employee, to his physician. Any physician who conducts an examination under the standard must furnish the employer all information required by the standard, and any other medical information related to occupational exposure to asbestos fibers.

AFFECTED EMPLOYMENT -- This general standard covers also employees in construction, ship repairing, shipbuilding, shipbreaking and longshoring who normally are subject to construction and maritime standards.

All parts of the new standard go into effect July 7 of this year except for the reduction from 5 fibers to 2, which takes effect July 1, 1976. The standards is scheduled for publication in the Federal Register June 7.

KELSEY-SEYBOLD CLINIC
6624 Fannin 526-2671
Houston, Texas 77025



October 20, 1971

Dear Sir:

The Kelsey-Seybold Clinic of Houston, Texas has formed a Consulting Service in Industrial Health in connection with our longstanding Occupational Health Services program.

We have enclosed two copies of a brochure which outlines the services available to you. This brochure also lists the men who are available to conduct surveys.

The new Occupational Safety and Health Act prompted the formation of this consulting service. We hope that we will be able to provide these services for your company. If you need additional information, please call us at 526-2671.

Thank you very much for your consideration.

Sincerely yours,

Maurice B. Johnston M.D.

Maurice B. Johnston, M.D., F.A.C.Pr.M.
Occupational Health Services

LAM 005408

DPMC-03004

THORPE PRODUCTS COMPANY

HOUSTON DALLAS BEAUMONT

THE FOLLOWING IS A LISTING BY TYPE OF INSULATING MATERIALS STOCKED OR FABRICATED BY THORPE

I. CALCIUM SILICATE AND HIGH TEMPERATURE INSULATIONS
- A. Thermobestos - Pipe Covering and Block *
- B. Metal-On Pipe Insulation *
- C. Superex Block

II. FIBERGLASS INSULATIONS
- A. Micro-Lok Pipe Insulation (snap-on)
- B. Microlite Blanket
- C. Duct Liner - Lina Coustic

III. MINERAL WOOL
- A. Spinglas 1000° Blanket
- B. #10 Blanket
- C. Griptex Block
- D. MF Pipe Covering
- E. Minibond - Stress Relieving Blanket
- F. Cerafelt
- G. Cerafiber

IV. FOAM INSULATIONS
- A. Urethane - Pipe Covering and Block
- B. T-Foam - Two Component Pour Urethane
- C. Styrofoam
- D. Ceramic Foam

V. UNDERGROUND INSULATION
- A. Witcolite
- B. Trisulite

VI. CELLULAR GLASS INSULATION
- A. Foamglas - Pipe Covering and Block

VII. INSULATION ACCESSORIES
- A. Cements
  - 1. 48 Insulation, Inc.
    - a. Quik Set (One Coat) 1000° Temp.
    - b. Super 48 1800° Temp.
  - 2. Johns Manville
    - a. 352 Cement *

LAM 005409

Continued .....

THE FOLLOWING IS A LISTING BY TYPE OF INSULATING MATERIALS STOCKED OR FABRICATED BY THORPE

VII. INSULATION ACCESSORIES - Continued
- B. - Weather-Barrier Jacketing
  1. D. C. Flexstone
  2. Asbestos Firetard *
- C. Glassfab
  1. 10 x 10 Mesh - White
  2. 20 x 20 Mesh - White and Black
- D. Bands, Seals and Screws
  1. Aluminum
  2. Galvanized
  3. Stainless Steel
  4. Expander Bands
- E. Wire
  1. Galvanized
  2. Stainless Steel
  3. Hex-Mesh
- F. Miscellaneous Insulation Accessories
  1. Standard Hairfelt
  2. Canvas
  3. Dux-Seal
  4. Fiberous Adhesive
  5. Micro-Seal 3A
  6. Thermon and Zeston Heat Transfer Cement
  7. Wheat Paste

VIII. PROTECTIVE COATINGS
- A. Weather Barrier Mastics
  1. Johns-Manville Insulkote ET and ST
  2. Vimasco Coatings and Adhesives
  3. Benjamin Foster Coating and Adhesives

IX. METAL JACKETING
- A. Aluminum
- B. Stainless Steel
- C. Galvanized

LAM 005410

Continued .....

THORPE PRODUCTS COMPANY

HOUSTON DALLAS BEAUMONT

THE FOLLOWING IS A LISTING BY TYPE OF INSULATING MATERIALS STOCKED OR FABRICATED BY THORPE

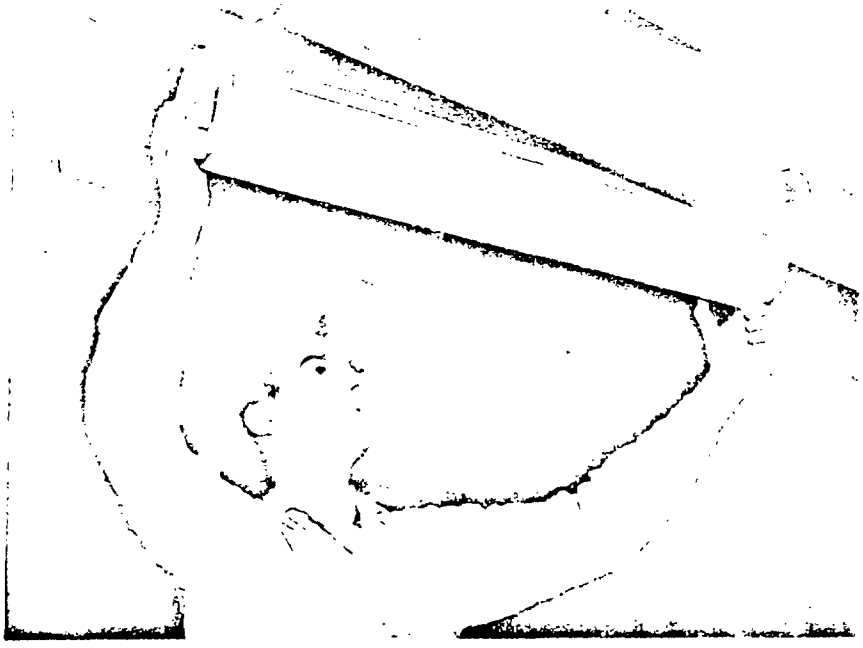
X. ASBESTOS CLOTH, BOARD, PAPER
- A. Asbestos Cloth *
- B. Firefelt *
- C. Millboard *
- D. Paper *
- E. Rollboard *
- F. Welding Paper *

XI. REFRACTORIES
- A. Johns-Manville Insulating Firebrick
- B. C-E Refractories
  1. Brick
  2. Castable
  3. Mortar

LAM 005411

Johns-Manville

PRODUCT INFORMATION



type: Pipe Insulation
temp. limit: 500F†

J-M MICRO-LOK fiber glass pipe insulation

DESCRIPTION: J-M Micro-Lok* is a lightweight pipe insulation made of long, fine flame-attenuated glass fibers bonded 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: Where required, Micro-Lok for 500F service is available, if specified on the order. Otherwise standard Micro-Lok for 370F is supplied. It is made in 3′ sections for IPS ½″ to 30″ depending on thickness, and copper tube sizes from ⅝″ to 12⅛″. (A special metal-jacketed Micro-Lok—known as Metal-Lok—is also available.)

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.

ADVANTAGES

Saves Fuel & Power

Low k factor of .22 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.

† See paragraph "Available Forms", above.

*J-M Trademark

LAM 005412

DPMC-03008

MICRO-LOK
Specification Data

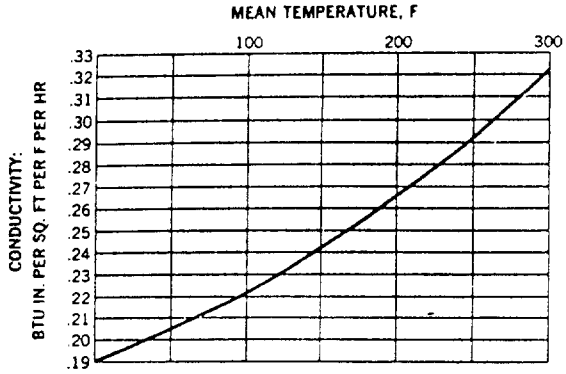
GENERAL PROPERTIES*

Temperature limit	**500F†**
Moisture absorption	**less than 0.2% by volume**
Alkalinity	**less than 0.6% expressed as Na_2O**
Corrosivity (with steel, copper, aluminum)	**does not cause or accelerate**
Capillarity (after 24 hours)	**negligible**
Shrinkage	**none**
Resistance to fungi and bacteria	**does not breed or promote**

*The values given herein are average typical values obtained in accordance with accepted test methods and are subject to change. Check the nearest J-M district office for latest information.

† See other side under "Available Forms."

THERMAL CONDUCTIVITY



JACKETING INFORMATION

***Canvas**—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.

Weather Proofing

***WP:** (Roofing Felt) 45 lb.

METAL-LOK: Factory-applied .016" or .010" aluminum, or .010" stainless steel jacket with special Z-joint, longitudinal seam closure and factory-supplied butt straps.

*Canvas jackets have a minimum 1½" longitudinal lap and a minimum 2½" circumferential lap. WP jacket also has a minimum 1½" longitudinal lap, and circumferential joints are sealed with 3" wide strips of the same jacketing material supplied in the carton.

GUIDE TO SPECIFICATIONS FOR APPLICATION AND FINISHING

Service & Temperature	Location	Jacket Material
Hot Water 250F	Exposed or Concealed	Canvas or *
	Outdoor	WP or Metal-Lok
Cold Water 50F	Exposed or Concealed	*
	Outdoor	WP or Metal-Lok
Chilled Water, Brine, Refrigerants and Special Processes	Exposed or Concealed	*
Dual Temp 212F to 35F**	Outdoor	* plus WP or .016 Aluminum
Hot Water, 500F Steam	Exposed or Concealed	Canvas
	Outdoor	WP or Metal-Lok

*J-M Flame-Safe® fiber glass pipe insulation with VB (vapor barrier) jacket.

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

COMPLIANCE WITH GOVERNMENT SPECS

MIL-I-22344
HH-I-558A, Form D, Type III, Class 12
HH-I-558A, Form D, Type III, Class 13

Note: HH-I-558A replaces the following.
HH-I-00558, Form C, Type VII, Class e (HH-I-552, 563, 564) and
HH-I-00559, Form C, Type V (HH-I-542, 562).

LAM 005413

Johns-Manville
22 East 40th Street, New York, N. Y. 10016

DPMC-03009

Johns-Manville

PRODUCT INFORMATION

type: Molded 90° Elbow Insulation

temp. limit: 1200F



J-M THERMOBESTOS LD MOLDED 90° ELBOW
pipe fitting insulation

■ **DESCRIPTION:** A molded pipe fitting insulation designed to fit 90° elbows on Thermobestos* and Metal-On* pipe insulation systems. Made of hydrous calcium silicate for strength and durability.

■ **AVAILABLE FORMS:** Thermobestos LD molded pipe fitting insulation is presently furnished to fit 90° elbows in both screwed and long radius welded sizes up through 12″ IPS and in nominal thicknesses of 1″, 1½″ and 2″, to match standard pipe insulation. Mitered sections of Metal-On (precision-cut at the factory) to fit elbows, sweeps, bends and valves are also available up to 24″ pipe size.

They can be furnished with canvas, Insulkote* ET weatherproofing mastic reinforced with Duramesh* porous glass fiber fabric, or a preformed Metal-On aluminum jacket.

■ **USES:** Especially recommended for use in the power generation and process industries on indoor and outdoor piping operating at temperatures to 1200F. Thermobestors LD elbows are light enough for easy handling and fast application. Repeated wettings have no permanent effect on them, thus making them ideal for installations subject to weather, or for insulating underground steam lines. Because they will not burn or carry flame, they may also be advantageously specified for use in the presence of inflammable gases and liquids.

*J-M Trademark

■ **ADVANTAGES**

Easy Application

There's no fuss, no muss, no time-consuming assembling problem with Thermobestos LD elbows. Just select two sections of the required size, slip them over the 90° pipe elbow, secure them together and apply finish. You can do a fast, accurate job every time with factory-molded fittings the exact size you need.

Chemically Stable

100% inorganic, will neither burn nor rot.

Exceptional Strength

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

Lightweight

Thermobestos LD elbows are as light as many insulating materials possessing a fraction of their strength and durability.

Not Damaged by Water

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

Low Conductivity

Thermobestos LD elbows offer the lowest *k* factor of all insulations in general use throughout the power generation and process industries.

LAM 005414

IN-8/78-1

DPMC-03010

THERMOBESTOS LD ELBOW INSULATION

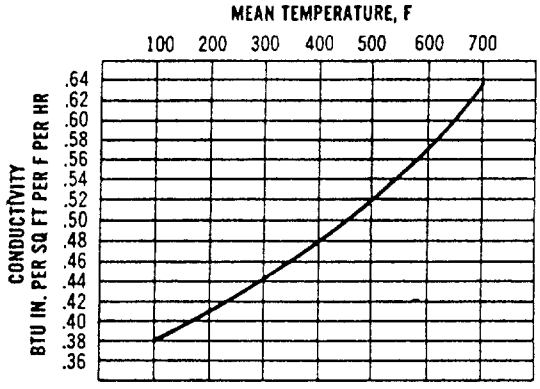
Specification Data

PHYSICAL PROPERTIES*

Density (dry)	13 lbs per cu ft
Transverse Strength (modulus of rupture)	95 psi
Compressive Strength (based on 2" thickness of block)	165 psi to produce 5% compression
Linear Shrinkage	1.5% after 24-hr soaking period at 1200F
Maximum Service Temperature	1200F

*The physical (or chemical) properties of Johns-Manville Thermobestos represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Check the Johns-Manville district office to assure current information.

THERMAL CONDUCTIVITY



COMPLIANCE WITH GOVERNMENT SPECS

MIL-I-2781
- Grade I, Class b, to 600F
- Grade II, Class d, to 750F
- Grade III, Class e, Type I, to 1200F

HH-I-523 Type II, Class A, to 1200F

COMPLIANCE WITH ASTM STANDARDS

C533, to 1200F

Johns-Manville

22 East 40th Street · New York, N. Y 10016

Sales Offices in Principal Cities

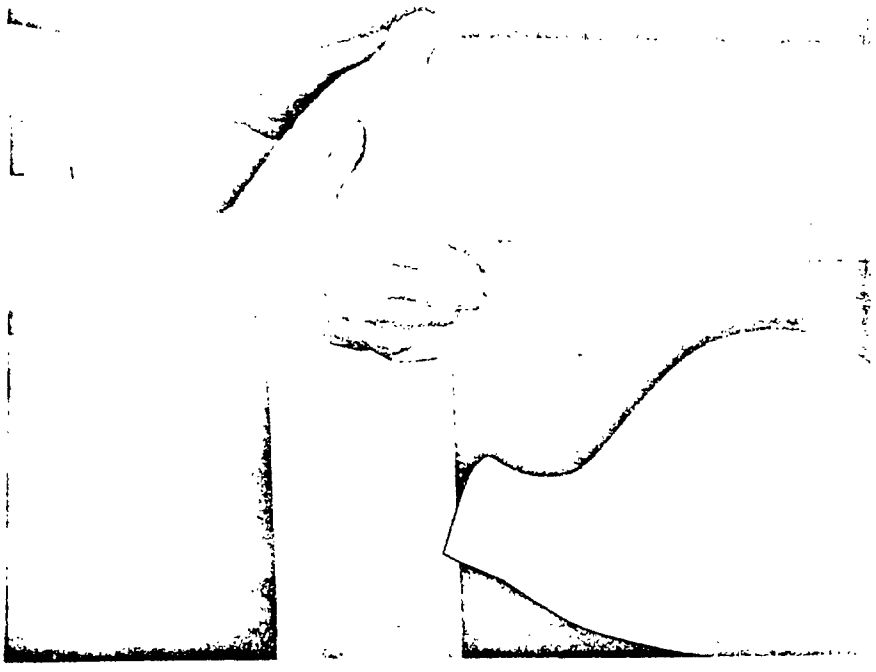
LAM 005415

DPMC-03011

Johns-Manville

PRODUCT INFORMATION

type: Pipe Fittings Insulation
temp. limit: 0F to 500F



J-M UNI-FIT*
One-Piece PVC, Insulated, Fitting Covers

DESCRIPTION: PVC Covers pre-molded in one piece in several shapes and sizes to hold an insulation insert and fit snugly over a variety of fittings. The insulation is J-M fiber glass. The insulated cover simplifies and speeds up the work of providing adequate insulation plus vapor barrier around fittings.

AVAILABLE COVERS: For 45° and 90° Elbows, Tees, and Valves—IPS Sizes ¼" through 12"; CT sizes ½" through 6⅛" O.D.s.

APPLICATIONS: For use in insulating chilled water, hot water, steam, and other piping systems in commercial, institutional, industrial construction. Meets requirements of Federal, State and local codes, and federal and military specifications as shown on the reverse side. For use with J-M FLAME-SAFE® pipe insulation.

ADVANTAGES:

Fire and Smoke Safety

The PVC cover is self-extinguishing. Flame spread—25 or less. Fuel contributed—0 (by ASTM E-84). The J-M insulation meets the safety requirements of federal, state and local codes, including GSA and Corps of Engineers.

Strong and Durable

Flexible PVC cover accepts blows and crushing, then returns to original shape. Withstands water, most acids and alkalies, chemical washdowns. Resists alcohols, aliphatic hydrocarbons, and oils. Insulation will not settle or separate in vibration.

Neat Appearance, Paintable

Attractive, off-white UNI-FIT cover provides excellent appearance. The smooth finish may be painted if desired.

Simple, Fast Installation

As shown in the UNI-FIT Installation Guide, there are three basic steps as follows: wrap the fiber glass insert around the fitting and tuck it in as necessary; pop on the fitting cover and smooth it into position; secure with staples, tacks, or tape as required. No tools required. Can be installed by hand, by only one skilled or semi-skilled workman.

*J-M Trademark

LAM 005416

IN-899A 9/71

DPMC-03012

J-M UNI-FIT

Specification Data

GENERAL PROPERTIES

Thermal Conductivity	at 75F mean temp., "k" = .27.
Temperature Limits	OF to 500F.
Non-Combustible	Will not burn or support combustion.
Vapor and Moisture Resistant	Fibers cannot absorb moisture. Resistance to moisture facilitates rapid drying out.
Sanitary	Odorless. Will not absorb odors. Provides no food for insects, rodents, or mildew.
Non-Corrosive	Will not cause corrosion when in contact with aluminum or steel as tested under alternating damp and dry conditions.
Vibration Proof	Will not settle or expand. Vibration helps the insulation expand into voids, if any.

SPECIFICATION DATA

PVC Jacketing—Fed. Spec. L-P-535C Composition A Type II Grade GU.

J-M fiber glass insulation—

HH-I-558a Mar. 7, 1967 Supercedes HHI-563 and HH-I-542	Insulation Blankets, Felts, Mineral Fiber, Industrial Types	Form B Type 1 Class 7 Class 8	Blankets, and felts, flexible 1000F to below ambient
MIL-I-22023B Oct. 16, 1964 Int. Amd. 1 Apr. 21, 1965	Industrial Felt, Thermal and Sound Absorption Felt, Fibrous Glass, Flexible	Type 1 Class 3	Thermal

Meets requirements of other federal, state, and local codes. Accepted for commercial, institutional, industrial, residential projects in all parts of U.S.

UNI-FIT PRE-MOLDED ONE PIECE PVC INSULATED FITTING SPECIFICATIONS

GENERAL:
Where the factory-premolded one-piece PVC insulated fitting covers are to be used, the proper factory precut insulation shall be applied to the fitting. The ends of the insulation shall be tucked snugly into the throat of the fitting and the edges adjacent to the pipe covering tufted and tucked in, fully insulating the pipe fitting. The one-piece PVC fitting cover is then secured by stapling, tack fastening, banding or taping the ends to the adjacent pipe covering.

CHILLED:
Chilled water systems shall be insulated as above and have all seam edges of the cover sealed with vapor-barrier adhesive mastic or equal. The circumferential edges of cover shall be wrapped with vapor-barrier pressure sensitive color matching Tape. The tape shall extend over the adjacent pipe insulation, and have an overlap on itself at least 2 inches on the downward side.

HOT:
On fittings where temperature exceeds 250°F, 2 layers of the factory precut insulation inserts shall be applied with a few wrappings of twine on first layer, to be sure there are no voids or hot spots. The fitting cover shall then be applied over the insulation as described above, in "General."

REFRIGERANT:
The same procedure for 2-layer insulation described above is to be followed on insulating fittings for pipe temperature 35°F and lower. In addition, the seam edges of the PVC fitting cover shall be sealed with vapor-barrier adhesive mastic or equal. The circumferential edges shall be wrapped with vapor-barrier pressure sensitive color matching Tape. The tape shall extend over the adjacent pipe insulation, and have an overlap on itself at least 2 inches on the downward side.

NOTE: The contractor will insulate all untested piping leaving all fittings uninsulated until after tests are completed.

THE PHYSICAL AND CHEMICAL PROPERTIES OF JOHNS-MANVILLE UNI-FIT REPRESENT TYPICAL, AVERAGE VALUES OBTAINED IN ACCORDANCE WITH ACCEPTED TEST METHODS AND ARE SUBJECT TO NORMAL MANUFACTURING VARIATIONS. THEY ARE SUPPLIED AS A TECHNICAL SERVICE AND ARE SUBJECT TO CHANGE WITHOUT NOTICE. CHECK THE JOHNS-MANVILLE DISTRICT OFFICE TO ASSURE CURRENT INFORMATION.

Johns-Manville
22 East 40th Street · New York, N. Y. 10016
Sales Offices in Principal Cities

LAM 005417

DPMC-03013

FORTY-EIGHT INSULATIONS INC. AURORA, ILLINOIS

3600
January 1972

FORTY-EIGHT MF PIPE INSULATION

FORTY-EIGHT MF PIPE INSULATION is an effective thermal and acoustical insulation in one product. It is manufactured from 1600°F refractory fibers as a one piece, wraparound pipe covering, grooved to fit pipe sizes up to 36" IPS. It is shipped flat to reduce shipping, warehousing and handling costs.

MF PIPE INSULATION is wired on in economical, single layer application. Cutouts for hangers, bends, etc. are easily made with a knife. MF PIPE INSULATION is water repellent, incombustible and may be used on carbon or stainless steel piping.

Thermal insulating performance is generally better than that of preformed pipe covering. Acoustical insulating performance is excellent. Practical and useful solutions for specific noise problems can be found by matching MF PIPE INSULATION dB reduction data with profile measurements (dB levels at the various CPS frequencies) detailing those problems.

[redacted]

THERMAL INSULATING EFFICIENCY

Mean Temperature	K-Factor
200°F	.275
400°F	.335
600°F	.44
700°F	.53

ACOUSTICAL INSULATING EFFICIENCY

Average* dB(A) Reductions	
2" thickness	15
3" thickness	23
4" thickness	29

*Under averaged conditions:
1000 to 4000 CPS & 100 to 115 dB(A)

SERVICE TEMPERATURE: Up to 1200°F.

DENSITY: Nominal 9 lbs. per cu. ft.

RECOMMENDED THICKNESSES

Temp. Range	Up to 300°F	300 - 500°F	500 - 700°F	700 - 800°F	800 - 1000°F	1000 - 1200°F
Pipe Size	Insulation Thickness					
2"	1"	1"	1½"	2½"	3"	3½"
3"	1"	1½"	2"	2½"	3"	3½"
4"	1"	1½"	2"	2½"	3"	3½"
6"	1"	1½"	2"	2½"	3½"	4"
8"	1½"	1½"	2"	3"	3½"	4"
10"	1½"	1½"	2½"	3"	3½"	4"
12"	1½"	1½"	2½"	3"	3½"	4"
14" & Larger	1½"	1½"	2½"	3"	3½"	4"

MOISTURE ADSORPTION: Less than 1%.

LEACHABLE CHLORIDES: Less than 20 ppm.

SPECIFICATIONS: Federal: HH-I-558a, Form D, Type IV, Class 14 & 15.
MIL-I-24244(SHIPS).

LAM 005418

Values shown are subject to our normal manufacturing and testing methods and tolerances.

DPMC-03014