

JOHNS-MANVILLE FIBERGLASS PIPE INSULATION

LIFE SAFETY
PRODUCTS

REDUCE HAZARDS OF
FIRE & SMOKE

381S22

APPLICATION SPECIFICATIONS

Johns-Manville offers detailed "Insulation Specifications" sheets for Micro-Lot Pipe Insulation, written in accordance with climatic conditions, design preferences and installation techniques or practices prevailing in various regions of the country. They're available from the local J-M representative or from J-M sales offices.

- | | | |
|------------------|-------------------------|---------------------|
| AKRON, Ohio | DETROIT, Mich. | PITTSBURGH, Penn. |
| ALBANY, N.Y. | HOUSTON, Texas | PROVIDENCE, R.I. |
| ATLANTA, Ga. | INDIANAPOLIS, Ind. | RICHMOND, Va. |
| BALTIMORE, Md. | JACKSONVILLE, Fla. | ST. LOUIS, Mo. |
| BOSTON, Mass. | NORTH JACKSON CITY, Mo. | SAN ANTONIO, Texas |
| BUFFALO, N.Y. | LANSING, Mich. | SAN FRANCISCO, Cal. |
| CHICAGO, Ill. | LOS ANGELES, Cal. | SEATTLE, Wash. |
| CINCINNATI, Ohio | MILWAUKEE, Wis. | SYRACUSE, N.Y. |
| CLEVELAND, Ohio | MINNEAPOLIS, Minn. | TAMPA, Fla. |
| COLUMBUS, Ohio | NEW YORK, N.Y. | TOLEDO, Ohio |
| DALLAS, Texas | OULAHOMA CITY, Okla. | TULSA, Okla. |
| DENVER, Col. | PHILADELPHIA, Penn. | WASHINGTON, D.C. |
| | | WASHINGTON, Va. |
| | | WINNEMAN, Penn. |

JOHNS-MANVILLE
the name to mark of first for Fiber Glass

HEADQUARTERS 22 East 40th Street, New York, N.Y. 10016
JOHNS-MANVILLE INTERNATIONAL 22 E 40th St. New York, N.Y. CABLE ADDRESS: Johnmav

381S21

1964 U.S.A.

J-M FLAME-SAFE

meets the rigid performance standards for
"LIFE SAFETY" SPECIFICATIONS

Consulting engineers and specification writers are now able, to a far greater degree, to fulfill their primary obligation to protect the safety, health and well-being of the general public.

They can now write LIFE SAFETY SPECIFICATIONS to include J-M LIFE SAFETY PRODUCTS designed to furnish the industry with the optimum in permanently fire- and smoke-safe insulations, in combination with high thermal efficiency.

A LIFE SAFETY SPECIFICATION is a performance specification based on composite ratings of 25 or less Flame Spread and 50 or less Smoke Developed, as described on the preceding page.

Guide specifications for J-M Life Safety Products are contained in a booklet (Form IN-768A) available from Johns-Manville Industrial Insulations sales offices, sales representatives or distributors of J-M industrial insulations. These specifications are intended to be basic guides for the revision of standard specifications to include Life Safety Products and not necessarily to supersede local material application and thickness recommendations.

3S1824

3

guide specifications

IN-768A 9/70

2

LIFE SAFETY
PRODUCTS

REDUCE HAZARDS OF
FIRE & SMOKE

LIFE SAFETY PRODUCTS

TO REDUCE HAZARDS OF FIRE & SMOKE

For Standard Construction Using 1/2" Min. Thickness

Product	Flame Spread	Smoke Developed
Asbestos	25	50
Rock Wool	25	50
Wool	25	50
Mineral Wool	25	50
Perlite	25	50
Vermiculite	25	50
Cellulose	25	50
Polystyrene	25	50
Urethane	25	50
Concrete	25	50
Gypsum	25	50
Brick	25	50
Block	25	50
Tile	25	50
Glazed Tile	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50
Marble	25	50
Granite	25	50
Slate	25	50
Schist	25	50
Gneiss	25	50
Quartzite	25	50
Sandstone	25	50
Limestone	25	50
Dolomite	25	50

J-M FLAME-SAFE

is designed for

**SUPERIOR THERMAL PERFORMANCE
HIGH STRENGTH AND DURABILITY
WIDE RANGE OF SERVICE
ECONOMICAL APPLICATION**

all made possible by skillful product development
and advanced manufacturing technology

J-M Flame-Safe is a highly effective, one-piece, resilient pipe insulation made of long, fine, flame-attenuated glass fibers. It is designed for temperatures from zero to 500°F. The three-foot sections are standard, wound in one piece, then cut longitudinally through one wall and partially through the other. Due to the remarkable strength and pliability of the fibers a "hinge" is thus formed, allowing the section to be opened uniformly, and with only slight effort, over its entire length. When the leverage is released it closes automatically and firmly. This feature speeds and simplifies application. The one-piece design also augments the thermal effectiveness of Flame-Safe because there is only one longitudinal joint—half as many as two-piece pipe insulations.

Flame-Safe pipe insulation is available with a variety of factory-applied jackets for the thermal protection of brine, refrigerant and special process lines; hot and chilled water lines; dual temperatures, steam and other hot lines to 500°F. It is made in various wall thicknesses and a wide range of standard iron pipe and copper tubing sizes. (See Page 11.)

Note: At temperatures above 400°F a limited amount of binder degradation may occur in the insulation near the hot surface of the pipe. This does not reduce the thermal effectiveness of Flame-Safe in any way. Furthermore, under these circumstances, no long retention of selected fibers in Flame-Safe is a hindrance; the "aging" effect of any migration to the pipe wall is minor and is corrected by the absorption of the binder which fills the fibers to seal, effectively sealing the joints with a repeating loss of thermal protection. This is not a problem with Flame-Safe.

Flame-Safe is made in 3-foot lengths and sold in 10-foot sections. It is available in 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 30, 36, 48, 60, 72, 96, 120, 144, 168, 192, 216, 240, 288, 360, 480, 600, 720, 840, 960, 1080, 1200, 1440, 1680, 1920, 2160, 2400, 2880, 3600, 4800, 6000, 7200, 8400, 9600, 10800, 12000, 14400, 16800, 19200, 21600, 24000, 28800, 36000, 48000, 60000, 72000, 84000, 96000, 108000, 120000, 144000, 168000, 192000, 216000, 240000, 288000, 360000, 480000, 600000, 720000, 840000, 960000, 1080000, 1200000, 1440000, 1680000, 1920000, 2160000, 2400000, 2880000, 3600000, 4800000, 6000000, 7200000, 8400000, 9600000, 10800000, 12000000, 14400000, 16800000, 19200000, 21600000, 24000000, 28800000, 36000000, 48000000, 60000000, 72000000, 84000000, 96000000, 108000000, 120000000, 144000000, 168000000, 192000000, 216000000, 240000000, 288000000, 360000000, 480000000, 600000000, 720000000, 840000000, 960000000, 1080000000, 1200000000, 1440000000, 1680000000, 1920000000, 2160000000, 2400000000, 2880000000, 3600000000, 4800000000, 6000000000, 7200000000, 8400000000, 9600000000, 10800000000, 12000000000, 14400000000, 16800000000, 19200000000, 21600000000, 24000000000, 28800000000, 36000000000, 48000000000, 60000000000, 72000000000, 84000000000, 96000000000, 108000000000, 120000000000, 144000000000, 168000000000, 192000000000, 216000000000, 240000000000, 288000000000, 360000000000, 480000000000, 600000000000, 720000000000, 840000000000, 960000000000, 1080000000000, 1200000000000, 1440000000000, 1680000000000, 1920000000000, 2160000000000, 2400000000000, 2880000000000, 3600000000000, 4800000000000, 6000000000000, 7200000000000, 8400000000000, 9600000000000, 10800000000000, 12000000000000, 14400000000000, 16800000000000, 19200000000000, 21600000000000, 24000000000000, 28800000000000, 36000000000000, 48000000000000, 60000000000000, 72000000000000, 84000000000000, 96000000000000, 108000000000000, 120000000000000, 144000000000000, 168000000000000, 192000000000000, 216000000000000, 240000000000000, 288000000000000, 360000000000000, 480000000000000, 600000000000000, 720000000000000, 840000000000000, 960000000000000, 1080000000000000, 1200000000000000, 1440000000000000, 1680000000000000, 1920000000000000, 2160000000000000, 2400000000000000, 2880000000000000, 3600000000000000, 4800000000000000, 6000000000000000, 7200000000000000, 8400000000000000, 9600000000000000, 10800000000000000, 12000000000000000, 14400000000000000, 16800000000000000, 19200000000000000, 21600000000000000, 24000000000000000, 28800000000000000, 36000000000000000, 48000000000000000, 60000000000000000, 72000000000000000, 84000000000000000, 96000000000000000, 108000000000000000, 120000000000000000, 144000000000000000, 168000000000000000, 192000000000000000, 216000000000000000, 240000000000000000, 288000000000000000, 360000000000000000, 480000000000000000, 600000000000000000, 720000000000000000, 840000000000000000, 960000000000000000, 1080000000000000000, 1200000000000000000, 1440000000000000000, 1680000000000000000, 1920000000000000000, 2160000000000000000, 2400000000000000000, 2880000000000000000, 3600000000000000000, 4800000000000000000, 6000000000000000000, 7200000000000000000, 8400000000000000000, 9600000000000000000, 10800000000000000000, 12000000000000000000, 14400000000000000000, 16800000000000000000, 19200000000000000000, 21600000000000000000, 24000000000000000000, 28800000000000000000, 36000000000000000000, 48000000000000000000, 60000000000000000000, 72000000000000000000, 84000000000000000000, 96000000000000000000, 108000000000000000000, 120000000000000000000, 144000000000000000000, 168000000000000000000, 192000000000000000000, 216000000000000000000, 240000000000000000000, 288000000000000000000, 360000000000000000000, 480000000000000000000, 600000000000000000000, 720000000000000000000, 840000000000000000000, 960000000000000000000, 1080000000000000000000, 1200000000000000000000, 1440000000000000000000, 1680000000000000000000, 1920000000000000000000, 2160000000000000000000, 2400000000000000000000, 2880000000000000000000, 3600000000000000000000, 4800000000000000000000, 6000000000000000000000, 7200000000000000000000, 8400000000000000000000, 9600000000000000000000, 10800000000000000000000, 12000000000000000000000, 14400000000000000000000, 16800000000000000000000, 19200000000000000000000, 21600000000000000000000, 24000000000000000000000, 28800000000000000000000, 36000000000000000000000, 48000000000000000000000, 60000000000000000000000, 72000000000000000000000, 84000000000000000000000, 96000000000000000000000, 108000000000000000000000, 120000000000000000000000, 144000000000000000000000, 168000000000000000000000, 192000000000000000000000, 216000000000000000000000, 240000000000000000000000, 288000000000000000000000, 360000000000000000000000, 480000000000000000000000, 600000000000000000000000, 720000000000000000000000, 840000000000000000000000, 960000000000000000000000, 1080000000000000000000000, 1200000000000000000000000, 1440000000000000000000000, 1680000000000000000000000, 1920000000000000000000000, 2160000000000000000000000, 2400000000000000000000000, 2880000000000000000000000, 3600000000000000000000000, 4800000000000000000000000, 6000000000000000000000000, 7200000000000000000000000, 8400000000000000000000000, 9600000000000000000000000, 10800000000000000000000000, 12000000000000000000000000, 14400000000000000000000000, 16800000000000000000000000, 19200000000000000000000000, 21600000000000000000000000, 24000000000000000000000000, 28800000000000000000000000, 36000000000000000000000000, 48000000000000000000000000, 60000000000000000000000000, 72000000000000000000000000, 84000000000000000000000000, 96000000000000000000000000, 108000000000000000000000000, 120000000000000000000000000, 144000000000000000000000000, 168000000000000000000000000, 192000000000000000000000000, 216000000000000000000000000, 240000000000000000000000000, 288000000000000000000000000, 360000000000000000000000000, 480000000000000000000000000, 600000000000000000000000000, 720000000000000000000000000, 840000000000000000000000000, 960000000000000000000000000, 1080000000000000000000000000, 1200000000000000000000000000, 1440000000000000000000000000, 1680000000000000000000000000, 1920000000000000000000000000, 2160000000000000000000000000, 2400000000000000000000000000, 2880000000000000000000000000, 3600000000000000000000000000, 4800000000000000000000000000, 6000000000000000000000000000, 7200000000000000000000000000, 8400000000000000000000000000, 9600000000000000000000000000, 10800000000000000000000000000, 12000000000000000000000000000, 14400000000000000000000000000, 16800000000000000000000000000, 19200000000000000000000000000, 21600000000000000000000000000, 24000000000000000000000000000, 28800000000000000000000000000, 36000000000000000000000000000, 48000000000000000000000000000, 60000000000000000000000000000, 72000000000000000000000000000, 84000000000000000000000000000, 96000000000000000000000000000, 108000000000000000000000000000, 120000000000000000000000000000, 144000000000000000000000000000, 168000000000000000000000000000, 192000000000000000000000000000, 216000000000000000000000000000, 240000000000000000000000000000, 288000000000000000000000000000, 360000000000000000000000000000, 480000000000000000000000000000, 600000000000000000000000000000, 720000000000000000000000000000, 840000000000000000000000000000, 960000000000000000000000000000, 1080000000000000000000000000000, 1200000000000000000000000000000, 1440000000000000000000000000000, 1680000000000000000000000000000, 1920000000000000000000000000000, 2160000000000000000000000000000, 2400000000000000000000000000000, 2880000000000000000000000000000, 3600000000000000000000000000000, 4800000000000000000000000000000, 6000000000000000000000000000000, 7200000000000000000000000000000, 8400000000000000000000000000000, 9600000000000000000000000000000, 10800000000000000000000000000000, 12000000000000000000000000000000, 14400000000000000000000000000000, 16800000000000000000000000000000, 19200000000000000000000000000000, 21600000000000000000000000000000, 24000000000000000000000000000000, 28800000000000000000000000000000, 36000000000000000000000000000000, 48000000000000000000000000000000, 60000000000000000000000000000000, 72000000000000000000000000000000, 84000000000000000000000000000000, 96000000000000000000000000000000, 108000000000000000000000000000000, 120000000000000000000000000000000, 144000000000000000000000000000000, 168000000000000000000000000000000, 192000000000000000000000000000000, 216000000000000000000000000000000, 240000000000000000000000000000000, 288000000000000000000000000000000, 360000000000000000000000000000000, 480000000000000000000000000000000, 600000000000000000000000000000000, 720000000000000000000000000000000, 840000000000000000000000000000000, 960000000000000000000000000000000, 1080000000000000000000000000000000, 1200000000000000000000000000000000, 1440000000000000000000000000000000, 1680000000000000000000000000000000, 1920000000000000000000000000000000, 2160000000000000000000000000000000, 2400000000000000000000000000000000, 2880000000000000000000000000000000, 3600000000000000000000000000000000, 4800000000000000000000000000000000, 6000000000000000000000000000000000, 7200000000000000000000000000000000, 8400000000000000000000000000000000, 9600000000000000000000000000000000, 10800000000000000000000000000000000, 12000000000000000000000000000000000, 14400000000000000000000000000000000, 16800000000000000000000000000000000, 19200000000000000000000000000000000, 21600000000000000000000000000000000, 24000000000000000000000000000000000, 28800000000000000000000000000000000, 36000000000000000000000000000000000, 48000000000000000000000000000000000, 60000000000000000000000000000000000, 72000000000000000000000000000000000, 84000000000000000000000000000000000, 96000000000000000000000000000000000, 108000000000000000000000000000000000, 120000000000000000000000000000000000, 144000000000000000000000000000000000, 168000000000000000000000000000000000, 192000000000000000000000000000000000, 216000000000000000000000000000000000, 240000000000000000000000000000000000, 288000000000000000000000000000000000, 360000000000000000000000000000000000, 480000000000000000000000000000000000, 600000000000000000000000000000000000, 720000000000000000000000000000000000, 840000000000000000000000000000000000, 960000000000000000000000000000000000, 1080000000000000000000000000000000000, 1200000000000000000000000000000000000, 1440000000000000000000000000000000000, 1680000000000000000000000000000000000, 1920000000000000000000000000000000000, 2160000000000000000000000000000000000, 2400000000000000000000000000000000000, 2880000000000000000000000000000000000, 3600000000000000000000000000000000000, 4800000000000000000000000000000000000, 6000000000000000000000000000000000000, 7200000000000000000000000000000000000, 8400000000000000000000000000000000000, 9600000000000000000000000000000000000, 10800000000000000000000000000000000000, 12000000000000000000000000000000000000, 14400000000000000000000000000000000000, 16800000000000000000000000000000000000, 19200000000000000000000000000000000000, 21600000000000000000000000000000000000, 24000000000000000000000000000000000000, 28800000000000000000000000000000000000, 36000000000000000000000000000000000000, 48000000000000000000000000000000000000, 60000000000000000000000000000000000000, 72000000000000000000000000000000000000, 84000000000000000000000000000000000000, 96000000000000000000000000000000000000, 108000000000000000000000000000000000000, 120000000000000000000000000000000000000, 144000000000000000000000000000000000000, 168000000000000000000000000000000000000, 192000000000000000000000000000000000000, 216000000000000000000000000000000000000, 240000000000000

Color Coded for Positive Identification

Each section of J-M Flame-Safe pipe insulation is color coded to insure selection and use of the specified type at the job site. It also facilitates inspection during installation. At the end of every section the pipe size, wall thickness and type of jacket is printed in bold letters and in the following colors:

GC	Orange
GCVB	Green
VBC	Blue
GPC	Red

The jacking is completely covered when the butt strips are applied.

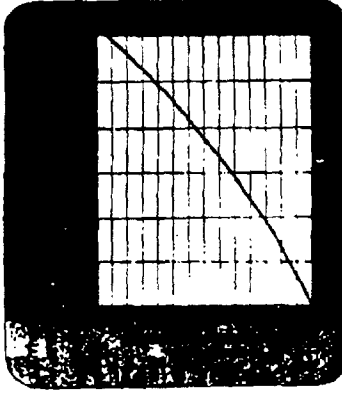
MINIMUM HEAT LOSS saves fuel and power

The high thermal performance of Flame-Safe is due primarily to the basic quality and characteristics of the glass fibers of which it is made.

1. High degree of fiberization
2. Fineness of the fibers.
3. Uniform diameter of the fibers.

The "flame-retardant" method used by Johns-Manville produces insulation that is virtually 100% fiberized. This gives Flame-Safe a thermal performance rating superior to other types of fibrous pipe insulation of twice the density. This same method also makes possible the production of long, extremely fine, exceptionally uniform fibers. As a result, enormously more and smaller air spaces are created in the insulation, adding considerably to its effectiveness in retarding the transfer of heat. Another important factor contributing to the low conductivity of Flame-Safe (and to its structural strength) is the predominantly lateral orientation of the fibers as the insulation is built up while being cylindrically wound to form the sections.

Owing to the cumulative effect of these properties in Flame-Safe, jacking temperatures are immediately maintained at proper levels, the system operates more efficiently, and fuel and power cost is reduced.



RESILIENCY forestalls damage

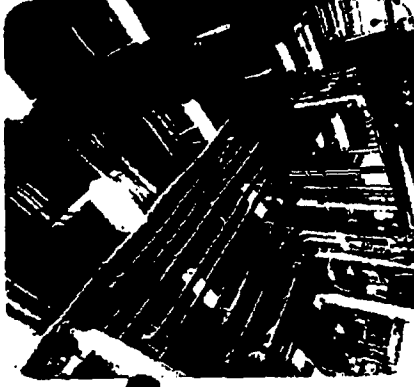
During service on piping there is much less chance of vapor barriers or protective jackets on Flame-Safe being punctured or torn from accidental impact. This is due to the exceptional resiliency of the glass fibers which absorb blows or compression, allowing the jacket to flex and then return to original position. Jackets on heavier density pipe insulations are more apt to shear or puncture because they lack this cushioning support.



When subjected to impact, Flame-Safe insulation does not shatter or break apart. The resiliency of the glass fibers and uniformity of the fibers which make up the insulation prevent it from breaking apart.

UNIFORMITY results in neat installed appearance

Flame-Safe pipe insulation sections are precision-made and uniform in both inside and outside diameter, and in wall thickness. Accuracy of the inside diameter is due to the winding on lightly polished steel mandrels. Wall thicknesses are consistent and the outside surfaces are smooth and true because, in the manufacturing process, each section is accurately sized by an exclusive J-M patented method. This produces proper alignment with adjacent sections and a well-tailored appearance for the entire pipe system.



A typical Flame-Safe insulation system as installed on a pipe. The uniform appearance is a result of the precision manufacturing process. The uniformity of the sections and the uniformity of the fibers which make up the insulation prevent it from breaking apart.

TIME-SAVING FEATURES speed installation

The one-piece construction and "spring-hinge" opening and closing action of Flame-Safe permit faster application with assurance that a proper closure is made. Sections open easily and evenly over the full length, then close automatically around the pipe, holding themselves in place. This allows the workman to use both hands for more positive lap sealing—a very

important application detail, especially where vapor barriers are concerned.



The single jacket on Flame-Safe means that there is no need for a separate vapor barrier. The single layer is sufficient to provide the required protection.

In manufacturing Flame-Safe, J-M uses an exclusive method of gradually building up the wall thickness as the insulation is wound on the mandrel. As a result, it is easy to strip away thin layers from the inside surface to the exact size and shape of pipe unions, reducers and other fittings. The installation will be snug and neat, without voids, bulges or undue compression at these points.

Other properties speed and simplify installation of Flame-Safe. It is light in weight, easy to cut and handle. Being exceptionally resilient, it is able to resist accidental damage from handling during application. Unlike more rigid types of insulation, the edges and ends of Flame-Safe sections will not break or crumble. Waste is reduced, repair time eliminated and expense avoided.

Installation cost

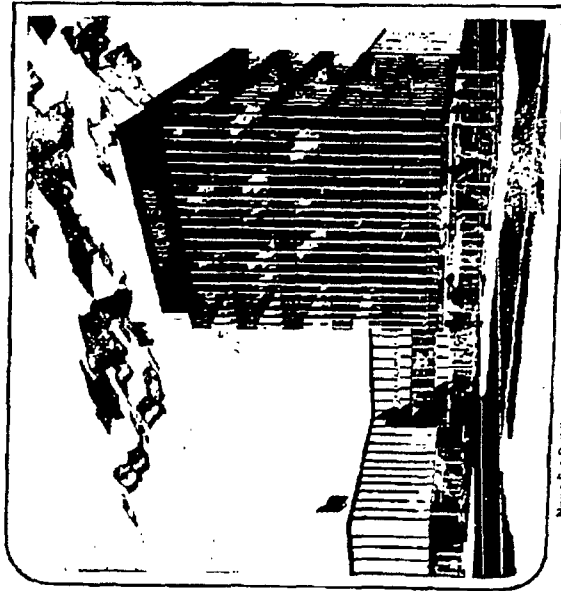
On an installed basis, the cost of Flame-Safe pipe insulation is comparable with conventional materials. Let a J-M representative explain the economic factors and show you how Flame-Safe costs compare with others on typical jobs in your area.

38,828

38,828

Add a vital margin of safety

Because of the noncombustible properties of J-M Flame-Safe, all types of structures can now possess a far greater margin of protection from the hazards of fire and smoke. Pictured here are some of the many buildings for which Flame-Safe was recently specified and installed to safeguard lives, property and, in some cases, irreplaceable contents.



News-Sun Building Milwaukee, Wis.

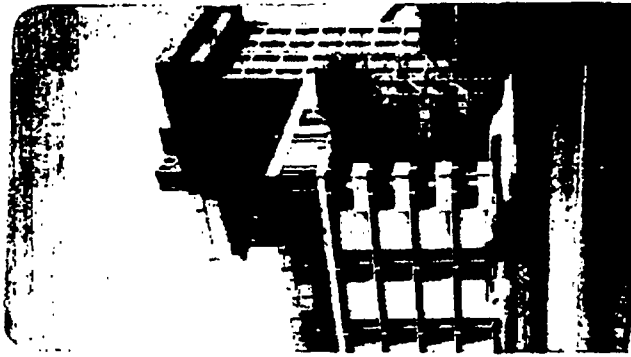
Art Museum,
Cincinnati, Ohio



Robins



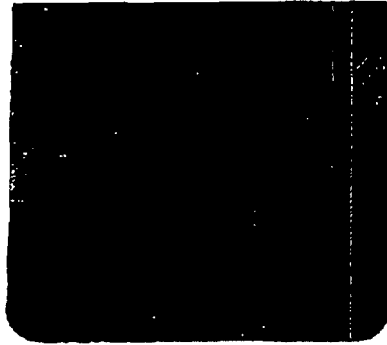
Robins Research Laboratories,
Richmond, Virginia



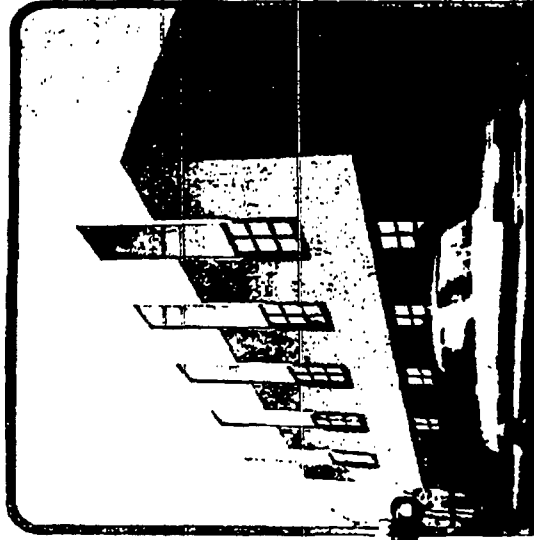
Logan Airport,
Berwyn, Massachusetts



Mount Pleasant High School,
New Castle, Delaware

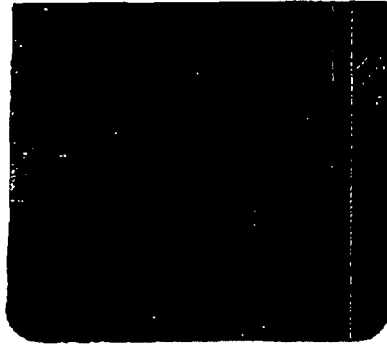


St. John's Cathedral, Milwaukee, Wisconsin



Physics Building, Syracuse University,
Syracuse, New York

Pacific Telephone and Telegraph Co.,
San Francisco, California



381829

8

381930

RECOMMENDED THICKNESSES

PIPE SIZE	WALL THICKNESS
1/2"	0.040
3/4"	0.045
1"	0.050
1 1/2"	0.060
2"	0.070
2 1/2"	0.080
3"	0.090
3 1/2"	0.100
4"	0.110
4 1/2"	0.120
5"	0.130
5 1/2"	0.140
6"	0.150
6 1/2"	0.160
7"	0.170
7 1/2"	0.180
8"	0.190
8 1/2"	0.200
9"	0.210
9 1/2"	0.220
10"	0.230
10 1/2"	0.240
11"	0.250
11 1/2"	0.260
12"	0.270
12 1/2"	0.280
13"	0.290
13 1/2"	0.300
14"	0.310
14 1/2"	0.320
15"	0.330
15 1/2"	0.340
16"	0.350
16 1/2"	0.360
17"	0.370
17 1/2"	0.380
18"	0.390
18 1/2"	0.400
19"	0.410
19 1/2"	0.420
20"	0.430
20 1/2"	0.440
21"	0.450
21 1/2"	0.460
22"	0.470
22 1/2"	0.480
23"	0.490
23 1/2"	0.500
24"	0.510
24 1/2"	0.520
25"	0.530
25 1/2"	0.540
26"	0.550
26 1/2"	0.560
27"	0.570
27 1/2"	0.580
28"	0.590
28 1/2"	0.600
29"	0.610
29 1/2"	0.620
30"	0.630
30 1/2"	0.640
31"	0.650
31 1/2"	0.660
32"	0.670
32 1/2"	0.680
33"	0.690
33 1/2"	0.700
34"	0.710
34 1/2"	0.720
35"	0.730
35 1/2"	0.740
36"	0.750
36 1/2"	0.760
37"	0.770
37 1/2"	0.780
38"	0.790
38 1/2"	0.800
39"	0.810
39 1/2"	0.820
40"	0.830
40 1/2"	0.840
41"	0.850
41 1/2"	0.860
42"	0.870
42 1/2"	0.880
43"	0.890
43 1/2"	0.900
44"	0.910
44 1/2"	0.920
45"	0.930
45 1/2"	0.940
46"	0.950
46 1/2"	0.960
47"	0.970
47 1/2"	0.980
48"	0.990
48 1/2"	1.000
49"	1.010
49 1/2"	1.020
50"	1.030
50 1/2"	1.040
51"	1.050
51 1/2"	1.060
52"	1.070
52 1/2"	1.080
53"	1.090
53 1/2"	1.100
54"	1.110
54 1/2"	1.120
55"	1.130
55 1/2"	1.140
56"	1.150
56 1/2"	1.160
57"	1.170
57 1/2"	1.180
58"	1.190
58 1/2"	1.200
59"	1.210
59 1/2"	1.220
60"	1.230
60 1/2"	1.240
61"	1.250
61 1/2"	1.260
62"	1.270
62 1/2"	1.280
63"	1.290
63 1/2"	1.300
64"	1.310
64 1/2"	1.320
65"	1.330
65 1/2"	1.340
66"	1.350
66 1/2"	1.360
67"	1.370
67 1/2"	1.380
68"	1.390
68 1/2"	1.400
69"	1.410
69 1/2"	1.420
70"	1.430
70 1/2"	1.440
71"	1.450
71 1/2"	1.460
72"	1.470
72 1/2"	1.480
73"	1.490
73 1/2"	1.500
74"	1.510
74 1/2"	1.520
75"	1.530
75 1/2"	1.540
76"	1.550
76 1/2"	1.560
77"	1.570
77 1/2"	1.580
78"	1.590
78 1/2"	1.600
79"	1.610
79 1/2"	1.620
80"	1.630
80 1/2"	1.640
81"	1.650
81 1/2"	1.660
82"	1.670
82 1/2"	1.680
83"	1.690
83 1/2"	1.700
84"	1.710
84 1/2"	1.720
85"	1.730
85 1/2"	1.740
86"	1.750
86 1/2"	1.760
87"	1.770
87 1/2"	1.780
88"	1.790
88 1/2"	1.800
89"	1.810
89 1/2"	1.820
90"	1.830
90 1/2"	1.840
91"	1.850
91 1/2"	1.860
92"	1.870
92 1/2"	1.880
93"	1.890
93 1/2"	1.900
94"	1.910
94 1/2"	1.920
95"	1.930
95 1/2"	1.940
96"	1.950
96 1/2"	1.960
97"	1.970
97 1/2"	1.980
98"	1.990
98 1/2"	2.000
99"	2.010
99 1/2"	2.020
100"	2.030
100 1/2"	2.040
101"	2.050
101 1/2"	2.060
102"	2.070
102 1/2"	2.080
103"	2.090
103 1/2"	2.100
104"	2.110
104 1/2"	2.120
105"	2.130
105 1/2"	2.140
106"	2.150
106 1/2"	2.160
107"	2.170
107 1/2"	2.180
108"	2.190
108 1/2"	2.200
109"	2.210
109 1/2"	2.220
110"	2.230
110 1/2"	2.240
111"	2.250
111 1/2"	2.260
112"	2.270
112 1/2"	2.280
113"	2.290
113 1/2"	2.300
114"	2.310
114 1/2"	2.320
115"	2.330
115 1/2"	2.340
116"	2.350
116 1/2"	2.360
117"	2.370
117 1/2"	2.380
118"	2.390
118 1/2"	2.400
119"	2.410
119 1/2"	2.420
120"	2.430
120 1/2"	2.440
121"	2.450
121 1/2"	2.460
122"	2.470
122 1/2"	2.480
123"	2.490
123 1/2"	2.500
124"	2.510
124 1/2"	2.520
125"	2.530
125 1/2"	2.540
126"	2.550
126 1/2"	2.560
127"	2.570
127 1/2"	2.580
128"	2.590
128 1/2"	2.600
129"	2.610
129 1/2"	2.620
130"	2.630
130 1/2"	2.640
131"	2.650
131 1/2"	2.660
132"	2.670
132 1/2"	2.680
133"	2.690
133 1/2"	2.700
134"	2.710
134 1/2"	2.720
135"	2.730
135 1/2"	2.740
136"	2.750
136 1/2"	2.760
137"	2.770
137 1/2"	2.780
138"	2.790
138 1/2"	2.800
139"	2.810
139 1/2"	2.820
140"	2.830
140 1/2"	2.840
141"	2.850
141 1/2"	2.860
142"	2.870
142 1/2"	2.880
143"	2.890
143 1/2"	2.900
144"	2.910
144 1/2"	2.920
145"	2.930
145 1/2"	2.940
146"	2.950
146 1/2"	2.960
147"	2.970
147 1/2"	2.980
148"	2.990
148 1/2"	3.000
149"	3.010
149 1/2"	3.020
150"	3.030
150 1/2"	3.040
151"	3.050
151 1/2"	3.060
152"	3.070
152 1/2"	3.080
153"	3.090
153 1/2"	3.100
154"	3.110
154 1/2"	3.120
155"	3.130
155 1/2"	3.140
156"	3.150
156 1/2"	3.160
157"	3.170
157 1/2"	3.180
158"	3.190
158 1/2"	3.200
159"	3.210
159 1/2"	3.220
160"	3.230
160 1/2"	3.240
161"	3.250
161 1/2"	3.260
162"	3.270
162 1/2"	3.280
163"	3.290
163 1/2"	3.300
164"	3.310
164 1/2"	3.320
165"	3.330
165 1/2"	3.340
166"	3.350
166 1/2"	3.360
167"	3.370
167 1/2"	3.380
168"	3.390
168 1/2"	3.400
169"	3.410
169 1/2"	3.420
170"	3.430
170 1/2"	3.440
171"	3.450
171 1/2"	3.460
172"	3.470
172 1/2"	3.480
173"	3.490
173 1/2"	3.500
174"	3.510
174 1/2"	3.520
175"	3.530
175 1/2"	3.540
176"	3.550
176 1/2"	3.560
177"	3.570
177 1/2"	3.580
178"	3.590
178 1/2"	3.600
179"	3.610
179 1/2"	3.620
180"	3.630
180 1/2"	3.640
181"	3.650
181 1/2"	3.660
182"	3.670
182 1/2"	3.680
183"	3.690
183 1/2"	3.700
184"	3.710
184 1/2"	3.720
185"	3.730
185 1/2"	3.740
186"	3.750
186 1/2"	3.760
187"	3.770
187 1/2"	3.780
188"	3.790
188 1/2"	3.800
189"	3.810
189 1/2"	3.820
190"	3.830
190 1/2"	3.840
191"	3.850
191 1/2"	3.860
192"	3.870
192 1/2"	3.880
193"	3.890
193 1/2"	3.900
194"	3.910
194 1/2"	3.920
195"	3.930
195 1/2"	3.940
196"	3.950
196 1/2"	3.960
197"	3.970
197 1/2"	3.980
198"	3.990
198 1/2"	4.000
199"	4.010
199 1/2"	4.020
200"	4.030
200 1/2"	4.040
201"	4.050
201 1/2"	4.060
202"	4.070
202 1/2"	4.080
203"	4.090
203 1/2"	4.100
204"	4.110
204 1/2"	4.120
205"	4.130
205 1/2"	4.140
206"	4.150
206 1/2"	4.160
207"	4.170
207 1/2"	4.180
208"	4.190
208 1/2"	4.200
209"	4.210
209 1/2"	4.220
210"	4.230
210 1/2"	4.240
211"	4.250
211 1/2"	4.260
212"	4.270
212 1/2"	4.280
213"	4.290
213 1/2"	4.300
214"	4.310
214 1/2"	4.320
215"	4.330
215 1/2"	4.340
216"	4.350
216 1/2"	4.360
217"	4.370
217 1/2"	4.380
218"	4.390
218 1/2"	4.400
219"	4.410
219 1/2"	4.420
220"	4.430
220 1/2"	4.440
221"	4.450
221 1/2"	4.460
222"	4.470
222 1/2"	4.480
223"	4.490
223 1/2"	4.500
224"	4.510
224 1/2"	4.520
225"	4.530
225 1/2"	4.540
226"	4.550
226 1/2"	4.560
227"	4.570
227 1/2"	4.580
228"	4.590
228 1/2"	4.600
229"	4.610
229 1/2"	4.620
230"	4.630
230 1/2"	4.640
231"	4.650
231 1/2"	4.660
232"	4.670
232 1/2"	4.680
233"	4.690
233 1/2"	4.700
234"	4.710
234 1/2"	4.720
235"	4.730
235 1/2"	4.740
236"	4.750
236 1/2"	4.760
237"	4.770
237 1/2"	4.780
238"	4.790
238 1/2"	4.800
239"	4.810
239 1/2"	4.820
240"	4.830
240 1/2"	4.840
241"	4.850
241 1/2"	4.860
242"	4.870
242 1/2"	4.880
243"	4.890
243 1/2"	4.900
244"	4.910
244 1/2"	4.920
245"	4.930
245 1/2"	4.940
246"	4.950
246 1/2"	4.960
247"	4.970
247 1/2"	4.980
248"	4.990
248 1/2"	5.000
249"	5.010
249 1/2"	5.020
250"	5.030
250 1/2"	5.040
251"	5.050
251 1/2"	5.060
252"	5.070
252 1/2"	5.080
253"	5.090
253 1/2"	5.100
254"	5.110
254 1/2"	5.120
255"	5.130
255 1/2"	5.140
256"	5.150
256 1/2"	5.160
257"	5.170
257 1/2"	5.180
258"	5.190
258 1/2"	5.200
259"	5.210
259 1/2"	

1990

[illegible]

FOR SIZES WITH SHOWE
UP TO 3 1/2" HULL.
MULTIPLE LAYER COMB-
INATIONS WILL BE FUL-
FILLED. SINGLE LAYER
AVAILABLE ON SPECIAL
ORDER.

[illegible]

	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099
0000	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099

[illegible]

NO.	PIPE SIZE (INCHES)	PIPE TEMPERATURE, °F	NOM. THICKNESS (INCHES)	OUTSIDE SURF. TEMP., °F	BTU	NOM. PIPE SIZE (INCHES)	PIPE TEMPERATURE, °F	NOM. THICKNESS (INCHES)	OUTSIDE SURF. TEMP., °F	BTU
1	1	1	1	1	1.1	1	1	1	1	1.1
2	2	2	2	2	2.2	2	2	2	2	2.2
3	3	3	3	3	3.3	3	3	3	3	3.3
4	4	4	4	4	4.4	4	4	4	4	4.4
5	5	5	5	5	5.5	5	5	5	5	5.5
6	6	6	6	6	6.6	6	6	6	6	6.6
7	7	7	7	7	7.7	7	7	7	7	7.7
8	8	8	8	8	8.8	8	8	8	8	8.8
9	9	9	9	9	9.9	9	9	9	9	9.9
10	10	10	10	10	10.0	10	10	10	10	10.0
11	11	11	11	11	11.1	11	11	11	11	11.1
12	12	12	12	12	12.2	12	12	12	12	12.2
13	13	13	13	13	13.3	13	13	13	13	13.3
14	14	14	14	14	14.4	14	14	14	14	14.4
15	15	15	15	15	15.5	15	15	15	15	15.5
16	16	16	16	16	16.6	16	16	16	16	16.6
17	17	17	17	17	17.7	17	17	17	17	17.7
18	18	18	18	18	18.8	18	18	18	18	18.8
19	19	19	19	19	19.9	19	19	19	19	19.9
20	20	20	20	20	20.0	20	20	20	20	20.0
21	21	21	21	21	21.1	21	21	21	21	21.1
22	22	22	22	22	22.2	22	22	22	22	22.2
23	23	23	23	23	23.3	23	23	23	23	23.3
24	24	24	24	24	24.4	24	24	24	24	24.4
25	25	25	25	25	25.5	25	25	25	25	25.5
26	26	26	26	26	26.6	26	26	26	26	26.6
27	27	27	27	27	27.7	27	27	27	27	27.7
28	28	28	28	28	28.8	28	28	28	28	28.8
29	29	29	29	29	29.9	29	29	29	29	29.9
30	30	30	30	30	30.0	30	30	30	30	30.0
31	31	31	31	31	31.1	31	31	31	31	31.1
32	32	32	32	32	32.2	32	32	32	32	32.2
33	33	33	33	33	33.3	33	33	33	33	33.3
34	34	34	34	34	34.4	34	34	34	34	34.4
35	35	35	35	35	35.5	35	35	35	35	35.5
36	36	36	36	36	36.6	36	36	36	36	36.6
37	37	37	37	37	37.7	37	37	37	37	37.7
38	38	38	38	38	38.8	38	38	38	38	38.8
39	39	39	39	39	39.9	39	39	39	39	39.9
40	40	40	40	40	40.0	40	40	40	40	40.0
41	41	41	41	41	41.1	41	41	41	41	41.1
42	42	42	42	42	42.2	42	42	42	42	42.2
43	43	43	43	43	43.3	43	43	43	43	43.3
44	44	44	44	44	44.4	44	44	44	44	44.4
45	45	45	45	45	45.5	45	45	45	45	45.5
46	46	46	46	46	46.6	46	46	46	46	46.6
47	47	47	47	47	47.7	47	47	47	47	47.7
48	48	48	48	48	48.8	48	48	48	48	48.8
49	49	49	49	49	49.9	49	49	49	49	49.9
50	50	50	50	50	50.0	50	50	50	50	50.0
51	51	51	51	51	51.1	51	51	51	51	51.1
52	52	52	52	52	52.2	52	52	52	52	52.2
53	53	53	53	53	53.3	53	53	53	53	53.3
54	54	54	54	54	54.4	54	54	54	54	54.4
55	55	55	55	55	55.5	55	55	55	55	55.5
56	56	56	56	56	56.6	56	56	56	56	56.6
57	57	57	57	57	57.7	57	57	57	57	57.7
58	58	58	58	58	58.8	58	58	58	58	58.8
59	59	59	59	59	59.9	59	59	59	59	59.9
60	60	60	60	60	60.0	60	60	60	60	60.0
61	61	61	61	61	61.1	61	61	61	61	61.1
62	62	62	62	62	62.2	62	62	62	62	62.2
63	63	63	63	63	63.3	63	63	63	63	63.3
64	64	64	64	64	64.4	64	64	64	64	64.4
65	65	65	65	65	65.5	65	65	65	65	65.5
66	66	66	66	66	66.6	66	66	66	66	66.6
67	67	67	67	67	67.7	67	67	67	67	67.7
68	68	68	68	68	68.8	68	68	68	68	68.8
69	69	69	69	69	69.9	69	69	69	69	69.9
70	70	70	70	70	70.0	70	70	70	70	70.0
71	71	71	71	71	71.1	71	71	71	71	71.1
72	72	72	72	72	72.2	72	72	72	72	72.2
73	73	73	73	73	73.3	73	73	73	73	73.3
74	74	74	74	74	74.4	74	74	74	74	74.4
75	75	75	75	75	75.5	75	75	75	75	75.5
76	76	76	76	76	76.6	76	76	76	76	76.6
77	77	77	77	77	77.7	77	77	77	77	77.7
78	78	78	78	78	78.8	78	78	78	78	78.8
79	79	79	79	79	79.9	79	79	79	79	79.9
80	80	80	80	80	80.0	80	80	80	80	80.0
81	81	81	81	81	81.1	81	81	81	81	81.1
82	82	82	82	82	82.2	82	82	82	82	82.2
83	83	83	83	83	83.3	83	83	83	83	83.3
84	84	84	84	84	84.4	84	84	84	84	84.4
85	85	85	85	85	85.5	85	85	85	85	85.5
86	86	86	86	86	86.6	86	86	86	86	86.6
87	87	87	87	87	87.7	87	87	87	87	87.7
88	88	88	88	88	88.8	88	88	88	88	88.8
89	89	89	89	89	89.9	89	89	89	89	89.9
90	90	90	90	90	90.0	90	90	90	90	90.0
91	91	91	91	91	91.1	91	91	91	91	91.1
92	92	92	92	92	92.2	92	92	92	92	92.2
93	93	93	93	93	93.3	93	93	93	93	93.3
94	94	94	94	94	94.4	94	94	94	94	94.4
95	95	95	95	95	95.5	95	95	95	95	95.5
96	96	96	96	96	96.6	96	96	96	96	96.6
97	97	97	97	97	97.7	97	97	97	97	97.7
98	98	98	98	98	98.8	98	98	98	98	98.8
99	99	99	99	99	99.9	99	99	99	99	99.9
100	100	100	100	100	100.0	100	100	100	100	100.0

NOM. PIPE SIZE (INCHES)	PIPE TEMPERATURE, F	NOM. THICKNESS (INCHES)	OUTSIDE SCORF. TEMP., F	BTU	NOM. PIPE SIZE (INCHES)				PIPE TEMPERATURE, F	NOM. THICKNESS (INCHES)	OUTSIDE SCORF. TEMP., F	BTU
					NOM. PIPE SIZE (INCHES)	PIPE TEMPERATURE, F	NOM. THICKNESS (INCHES)	OUTSIDE SCORF. TEMP., F				
1/2	100	1/8	100	100	1/2	100	100	100	100	1/2	100	100
3/4	100	1/8	100	100	3/4	100	100	100	100	3/4	100	100
1	100	1/8	100	100	1	100	100	100	100	1	100	100
1 1/4	100	1/8	100	100	1 1/4	100	100	100	100	1 1/4	100	100
1 1/2	100	1/8	100	100	1 1/2	100	100	100	100	1 1/2	100	100
2	100	1/8	100	100	2	100	100	100	100	2	100	100
2 1/2	100	1/8	100	100	2 1/2	100	100	100	100	2 1/2	100	100
3	100	1/8	100	100	3	100	100	100	100	3	100	100
3 1/2	100	1/8	100	100	3 1/2	100	100	100	100	3 1/2	100	100
4	100	1/8	100	100	4	100	100	100	100	4	100	100
4 1/2	100	1/8	100	100	4 1/2	100	100	100	100	4 1/2	100	100
5	100	1/8	100	100	5	100	100	100	100	5	100	100
5 1/2	100	1/8	100	100	5 1/2	100	100	100	100	5 1/2	100	100
6	100	1/8	100	100	6	100	100	100	100	6	100	100
6 1/2	100	1/8	100	100	6 1/2	100	100	100	100	6 1/2	100	100
7	100	1/8	100	100	7	100	100	100	100	7	100	100
7 1/2	100	1/8	100	100	7 1/2	100	100	100	100	7 1/2	100	100
8	100	1/8	100	100	8	100	100	100	100	8	100	100
8 1/2	100	1/8	100	100	8 1/2	100	100	100	100	8 1/2	100	100
9	100	1/8	100	100	9	100	100	100	100	9	100	100
9 1/2	100	1/8	100	100	9 1/2	100	100	100	100	9 1/2	100	100
10	100	1/8	100	100	10	100	100	100	100	10	100	100
10 1/2	100	1/8	100	100	10 1/2	100	100	100	100	10 1/2	100	100
11	100	1/8	100	100	11	100	100	100	100	11	100	100
11 1/2	100	1/8	100	100	11 1/2	100	100	100	100	11 1/2	100	100
12	100	1/8	100	100	12	100	100	100	100	12	100	100
12 1/2	100	1/8	100	100	12 1/2	100	100	100	100	12 1/2	100	100
13	100	1/8	100	100	13	100	100	100	100	13	100	100
13 1/2	100	1/8	100	100	13 1/2	100	100	100	100	13 1/2	100	100
14	100	1/8	100	100	14	100	100	100	100	14	100	100
14 1/2	100	1/8	100	100	14 1/2	100	100	100	100	14 1/2	100	100

[illegible]

[illegible]

INSULATION

type: Pipe Insulation
temp. limit: 500F*

Johns-Manville

[illegible]

Abstract

[illegible]

OFFICE OF THE ATTORNEY GENERAL, STATE OF TEXAS
 15000 NORTH FORT WORTH FORT WORTH, TEXAS 76104
 1990-1991 FISCAL YEAR - 1991-1992 FISCAL YEAR

1998年12月14日

[illegible]

38-1541

121 2:27 10.00

•

A low β factor of .22 at 95°F mean pin client temperature control. Snug closure head but

*Finnland für 1991 werden in Aussicht zu 100 U.
Nicht nur nach dem Ergebnis der Wahlen, sondern
nach dem Ergebnis der Wahlen.