

## BACKGROUND

Johns Manville has developed a new version of Trymer® PIR Insulation with exceptionally low flammability. This product is called Trymer 25-50 PIR Insulation and yields the very low flame spread/smoke developed indices of  $\leq 25 / 50$  at thicknesses of up to 1.5 inches in the ASTM E84 test.

Coupled with Trymer 2000XP, Saranex® CX Vapor Retarder Film and Tape, and, in some cases, Trymer Supercel Phenolic insulation, Johns Manville now offers the ideal product lineup for your mechanical insulation needs in commercial building chilled water applications.

## APPLICATION

The excellent low flammability as indicated by the performance of Trymer 25-50 in the ASTM E84 test coupled with other properties including high closed-cell content, water resistance, and very low (good) thermal conductivity, make the Trymer 25-50 the ideal insulation for use in commercial building chilled water pipe insulation applications.

## BENEFITS OF A TRYMER PIR SYSTEM

### Lower Cost, Higher Performance

Compared to cellular glass or phenolic insulation, a chilled water pipe insulation system based on Trymer 25-50 insulation offers substantially lower cost. A Trymer 25-50 system can have a total installed cost as low as half the cost of a cellular glass insulation system.

Compared to fiberglass with ASJ, a chilled water pipe insulation system based on Trymer 25-50 offers much better performance due to these properties:

- Greater than 90% closed-cell
- Superior resistance to liquid water & water vapor
- Better (lower) k-Factor
- Strong and rigid insulation
- Better performing vapor retarder (Saranex CX)
- No exposed paper which reduces mold growth and water absorption

## PHYSICAL PROPERTIES

Trymer 25-50 and the other JM products described in this data sheet have excellent physical properties which make them ideal for use in chilled water pipe insulation applications. Consult the appropriate JM product data sheet for the physical properties of Trymer 25-50, Trymer 2000XP, Trymer Supercel Phenolic, Saranex CX Vapor Retarder, and metal jacketing.

## RECOMMENDED INSULATION USAGE

### Buildings With Plenums

- Use Trymer 25-50 PIR pipe insulation in all locations (plenum and non-plenum) for the simplest installation.
- Use Trymer 25-50 PIR pipe insulation in plenum locations and Trymer 2000XP in non-plenum locations for a slightly more complex but lower cost solution.
- If both Trymer 25-50 and Trymer 2000XP are used on the same job, specifiers and contractors can be confident that these products will be used in their correct locations (plenum versus non-plenum) since they have very different appearance. Trymer 25-50 is gray while Trymer 2000XP retains its tan color.

### Buildings without Plenums (e.g., most hospitals)

- If a  $\leq 25/50$  flame spread/smoke developed rating is not required by the specification, then use Trymer 2000XP in all locations for a lower cost solution.
- If a  $\leq 25/50$  flame spread/smoke developed rating is required by the specification even in the absence of plenums, then use Trymer 25-50 in all locations for the simplest installation.

### Building Locations with High Humidity

- In very rare cases, the Trymer PIR insulation thickness required to prevent condensation on chilled water pipe inside a plenum could exceed 1.5 inches. This would only occur with a combination of particularly cold chilled water, large pipe size (which is unlikely to run in a plenum), and unusually high relative humidity. For this situation, Trymer Supercel Phenolic insulation should be used either only on those pipes where greater than 1.5 inches insulation thickness is required or in all locations depending on the specifier's desire for specification simplicity versus cost savings.

## COMPLIANCE TO STANDARDS

All of the Trymer brand insulation, Saranex CX Vapor Retarder Film, and metal jacketing materials mentioned in this document comply with the relevant ASTM standards as follows:

- Trymer 25-50 PIR – Complies with C591, Type IV
- Trymer 2000XP PIR – Complies with C591, Type IV
- Trymer Supercel Phenolic – Complies with C1126, Type III
- Saranex CX Vapor Retarder – Complies with C1136, Type VII or VIII
- Aluminum Jacketing – Complies with C1729
- Stainless Steel Jacketing – Complies with C1767

## TRYMER 25-50® PIR

### INSULATING CHILLED WATER SYSTEMS WITH POLYISOCYANURATE

#### CODES FOR ENERGY EFFICIENCY

Based on applicable energy codes, the maximum thickness of Trymer 25-50 PIR required for energy efficiency is 1 inch for any chilled water application.

There are two main sources for energy efficiency requirements that are used in model codes. These are the ASHRAE 90.1 standard and the International Energy Efficiency Code (IECC). Since the latest edition of the IECC merely requires compliance to 90.1 for pipe insulation, these two sources effectively collapse to one.

Table 6.8.3-2 in ASHRAE Standard 90.1 governs the insulation thickness on pipes in a commercial building, including chilled water pipe. This table is complex with the required insulation thickness depending on pipe temperature, insulation type/k-Factor, and NPS. This table also provides instruction for how to modify the table to account for insulation with better (lower) k-Factor such as Trymer 25-50 PIR.

Applying the proper calculations yields the result that 1-inch thickness of Trymer 25-50, Trymer 2000XP or Trymer Supercel Phenolic insulations will, in all cases, meet the code-mandated energy efficiency requirements for chilled water pipe.

#### INSTALLATION

Consult JM installation guidelines for insulation, vapor retarders, and metal jacketing for more details. These guides are all available on the Johns Manville website.

#### CODE COMPLIANCE - FLAMMABILITY

The usual code requirements for pipe insulation are found in sections 602.2.1 and 1204.1 of the International Mechanical Code (IMC). Section 1204.1 applies to pipe insulation not located in an air plenum and to comply with this section, the insulation must achieve ASTM E84 flame spread/smoke developed indices of  $\leq 25/450$ . Section 602.2.1 applies to pipe insulation located in an air plenum and to comply with this section, the insulation must achieve ASTM E84 flame spread/smoke developed indices of  $\leq 25/50$ .

##### Trymer 25-50 PIR Insulation

- Meets the flame spread/smoke developed requirements of both IMC sections at up to 1.5 inches of thickness so it can be used in all chilled water pipe insulation applications in a commercial building including inside a plenum.

##### Trymer 2000XP PIR Insulation

- Meets the flame spread/smoke developed requirements of IMC section 1204.1 so it can be used in all non-plenum chilled water pipe insulation applications such as rooftop, mechanical room, pipe chases, and industrial locations.

##### Saranex CX Vapor Retarder Film and Tape

- Meet the flame spread/smoke developed requirements of both IMC sections so they can be used in all chilled water pipe insulation applications in a commercial building including inside a plenum.

#### RECOMMENDED VAPOR RETARDER

For best results, the vapor retarder should be based on Saranex CX Film and Tape or a similar low permeance vapor retarder without exposed paper and without an easily damage ultra-thin layer of aluminum foil.

More specifically, in cold applications including chilled water pipe insulation, JM recommends against the use of ASJ with any type insulation. The paper layer in ASJ absorbs water which can lead to mold growth and corrosion of the thin aluminum foil layer in the ASJ. In addition, the foil layer is very thin and prone to pinholes. For more details, consult the Saranex CX Film and Tape Product Data Sheets on the Johns Manville website.

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Technical specifications as shown in this literature are intended to be used as general guidelines only. Please refer to the Safety Data Sheet and product label prior to using this product. The physical and chemical properties of the product listed herein 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. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you for current information.

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