

DATA SHEET

# Pyrogel XT

## FLEXIBLE INDUSTRIAL INSULATION FOR HIGH-TEMPERATURE APPLICATIONS

Pyrogel<sup>®</sup> XT is a high-temperature insulation blanket formed of silica aerogel and reinforced with a non-woven, glass-fiber batting. It is also available with a factory-applied foil vapor barrier (Pyrogel<sup>®</sup> XTZ) for low- to moderate-temperature applications such as chilled water piping.

Silica aerogels possess the lowest thermal conductivity of any known solid. Pyrogel XT achieves this industry-leading thermal performance in a flexible, environmentally safe, and easy-to-use product.

Ideal for insulating piping, vessels, tanks, and equipment, Pyrogel XT is an essential material for those seeking the ultimate in thermal efficiency.

### Physical Properties

|                       |  |  |
|-----------------------|--|--|
| <b>Thicknesses*</b>   | 0.20 in (5 mm)                                   | 0.40 in (10 mm)                                  |
| <b>Material Form*</b> | 60 in (1,500 mm) wide x 260 ft (80 m) long rolls | 60 in (1,500 mm) wide x 155 ft (47 m) long rolls |
| <b>Max. Use Temp.</b> | 1200°F (650°C)                                   |  |
| <b>Color</b>          | Beige  |  |
| <b>Density*</b>       | 11 lb/ft <sup>3</sup> (0.18 g/cc)                |  |
| <b>Hydrophobic</b>    | Yes  |  |

\*Nominal Values



### Advantages

#### Superior Thermal Performance

2 to 5 times better than competing insulation products

#### Reduced Thickness and Profile

Equal thermal resistance at a fraction of the thickness

#### Less Time and Labor to Install

Easily cut and conformed to complex shapes, tight curvatures, and spaces with restricted access

#### Physically Robust

Soft and flexible but with excellent springback, Pyrogel XT recovers its thermal performance even after compression events as high as 100 psi

#### Shipping and Warehousing Savings

Reduced material volume, high packing density, and low scrap rates can reduce logistics costs by a factor of five or more compared to rigid, pre-formed insulations

#### Simplified Inventory

Unlike rigid pre-forms such as pipe cover or board, the same Pyrogel XT blanket can be kitted to fit any shape or design

#### Hydrophobic Yet Breathable

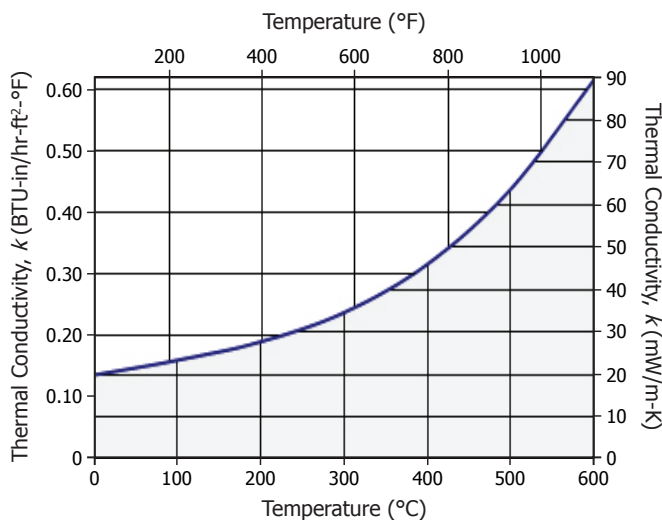
Pyrogel repels liquid water but allows vapor to pass through, helping to prevent corrosion under insulation

#### Environmentally Safe

Landfill disposable, shot-free, with no respirable fiber content

### Thermal Conductivity<sup>†</sup>

ASTM C 177 Results



| Mean Temp. °C    | 0    | 100  | 200  | 300  | 400  | 500  | 600  |
|------------------|------|------|------|------|------|------|------|
| °F               | 32   | 212  | 392  | 572  | 752  | 932  | 1112 |
| k mW/m-K         | 20   | 23   | 28   | 35   | 46   | 64   | 89   |
| BTU-in/hr-ft²-°F | 0.14 | 0.16 | 0.19 | 0.24 | 0.32 | 0.44 | 0.62 |

<sup>†</sup>Thermal conductivity measurements taken at a compressive load of 2 psi.

# Pyrogel XT

## Thicknesses Required for Personnel Protection\*

Design conditions:

Ambient temperature = 86°F (30°C)  
 Wind speed = 2.2 mph (1 m/s)  
 Surface emissivity = 0.15

\*These data are provided as an example only. Actual performance should be determined using the parameters relevant to the particular application. Please contact Aspen Aerogels for technical assistance.

| Pyrogel XT Thickness (mm) vs. Process Temperature and Nominal Pipe Size |               |               |               |               |               |               |               |               |               |                |                |                |                           |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|---------------------------|
| NPS in (mm)   | 100°C (210°F) | 150°C (300°F) | 200°C (390°F) | 250°C (480°F) | 300°C (570°F) | 350°C (660°F) | 400°C (750°F) | 450°C (840°F) | 500°C (930°F) | 550°C (1020°F) | 600°C (1110°F) | 650°C (1200°F) |                           |
| <b>0.5 (15)</b>   | 5             | 5             | 5             | 10            | 10            | 15            | 15            | 20            | 20            | 25             | 30             | 40             | 5 mm product              |
| <b>0.75 (20)</b>  | 5             | 5             | 5             | 10            | 10            | 15            | 15            | 20            | 25            | 30             | 35             | 45             |                           |
| <b>1 (25)</b>   | 5             | 5             | 10            | 10            | 15            | 15            | 20            | 25            | 30            | 35             | 40             | 50             |                           |
| <b>1.5 (40)</b>   | 5             | 5             | 10            | 10            | 15            | 20            | 20            | 25            | 30            | 40             | 45             | 55             |                           |
| <b>2 (50)</b>   | 5             | 5             | 10            | 15            | 15            | 20            | 25            | 30            | 35            | 40             | 50             | 60             |                           |
| <b>3 (80)</b>   | 5             | 10            | 10            | 15            | 20            | 25            | 30            | 35            | 40            | 50             | 60             | 70             |                           |
| <b>4 (100)</b>  | 5             | 10            | 10            | 15            | 20            | 25            | 30            | 35            | 45            | 55             | 65             | 75             |                           |
| <b>6 (150)</b>  | 5             | 10            | 15            | 20            | 25            | 30            | 35            | 45            | 50            | 60             | 75             | 85             |                           |
| <b>8 (200)</b>  | 5             | 10            | 15            | 20            | 25            | 30            | 40            | 45            | 55            | 70             | 80             | 95             | 5 mm and/or 10 mm product |
| <b>10 (250)</b>   | 5             | 10            | 15            | 20            | 25            | 35            | 40            | 50            | 60            | 75             | 85             | 105            |                           |
| <b>12 (300)</b>   | 5             | 10            | 15            | 20            | 30            | 35            | 45            | 55            | 65            | 75             | 90             | 110            |                           |
| <b>14 (350)</b>   | 5             | 10            | 15            | 25            | 30            | 35            | 45            | 55            | 65            | 80             | 95             | 110            |                           |
| <b>16 (400)</b>   | 5             | 10            | 15            | 25            | 30            | 40            | 45            | 55            | 70            | 80             | 100            | 115            |                           |
| <b>18 (450)</b>   | 5             | 10            | 20            | 25            | 30            | 40            | 50            | 60            | 70            | 85             | 100            | 120            |                           |
| <b>20 (500)</b>   | 5             | 10            | 20            | 25            | 30            | 40            | 50            | 60            | 75            | 90             | 105            | 125            |                           |
| <b>24 (600)</b>   | 5             | 15            | 20            | 25            | 35            | 40            | 50            | 65            | 75            | 90             | 110            | 130            |                           |
| <b>28 (700)</b>   | 5             | 15            | 20            | 25            | 35            | 45            | 55            | 65            | 80            | 95             | 115            | 135            |                           |
| <b>30 (750)</b>   | 5             | 15            | 20            | 25            | 35            | 45            | 55            | 65            | 80            | 95             | 115            | 140            |                           |
| <b>36 (900)</b>   | 5             | 15            | 20            | 30            | 35            | 45            | 55            | 70            | 85            | 100            | 120            | 145            |                           |
| <b>48 (1200)</b>  | 10            | 15            | 20            | 30            | 40            | 50            | 60            | 75            | 90            | 105            | 130            | 150            |                           |
| <b>Flat</b>   | 10            | 15            | 20            | 35            | 45            | 50            | 65            | 80            | 100           | 125            | 150            | 175            |                           |

## Specification Compliance and Performance

| Test Procedure | Property   | Results  |
|----------------|--|--|
| ASTM C165      | Compressive Strength                                   | Stress at 10% strain = 14.8 psi (102 kPa)<br>Stress at 25% strain = 26.6 psi (183 kPa) |
| ASTM C356      | Linear Shrinkage Under Soaking Heat                    | < 1.3% @ 1200°F (650°C)  |
| ASTM C411      | Hot Surface Performance                                | Passed   |
| ASTM C447      | Estimation of Maximum Use Temperature                  | 1200°F (650°C)   |
| ASTM C871      | Leachable Chloride, Fluoride, Silicate and Sodium Ions | Passed   |
| ASTM C1101     | Classifying the Flexibility of Mineral Fiber Blankets  | Class: Resilient Flexible  |
| ASTM C1104     | Water Vapor Sorption                                   | 2.25% (by weight)  |
| ASTM C1338     | Fungal Resistance of Insulation Materials              | Passed   |
| ASTM C1511     | Liquid Water Retention After Submersion                | 4% (by weight)   |
| ASTM E84       | Surface Burning Characteristics                        | Flame Spread Index = 0<br>Smoke Developed Index = 0                                    |
| ISO 1182:1990  | Non-Combustibility                                     | Meets criteria outlined in ISO 1182:1990   |
| ASTM E1354     | Cone Calorimetry                                       | No ignition at 50 kW/m <sup>2</sup>  |

## Characteristics

Pyrogel XT can be cut using conventional cutting tools including scissors, tin snips, and razor knives. The material can be dusty, and it is recommended gloves, safety glasses, and dust mask be worn when handling material. See MSDS for complete health and safety information.

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