



# FOAMGLAS®

Pittsburgh Corning

**Protecting Companies and Their People Worldwide™**

## INDUSTRIAL PIPE & EQUIPMENT INSULATION

FOAMGLAS® ONE™ insulation is a lightweight, rigid material composed of millions of completely sealed glass cells. FOAMGLAS® ONE™ insulation is manufactured by Pittsburgh Corning in a block form and then fabricated into a wide range of shapes and sizes to satisfy industrial and commercial insulation requirements.

### BENEFITS

#### CONSTANT INSULATING EFFICIENCY

FOAMGLAS® ONE™ insulation has a homogeneous, closed cell glass structure that resists moisture in both liquid and vapor forms and results in long term, constant insulating efficiency.

#### NONCOMBUSTIBLE

FOAMGLAS® ONE™ insulation is 100% glass and contains no binders or fillers – it cannot burn. It will not absorb flammable liquids or vapors. If a facility fire occurs, FOAMGLAS® ONE™ insulation can help protect people and equipment by aiding in the containment or suppression of the flames.

#### CORROSION RESISTENT

FOAMGLAS® ONE™ insulation is unaffected by common chemicals and by most corrosive atmospheres. It does not promote metal corrosion and its moisture resistance will help keep water from reaching equipment and piping.

#### LONG TERM DIMENSIONAL STABILITY

FOAMGLAS® ONE™ insulation is not affected by temperature differentials and humidity. It will not swell, warp, shrink or otherwise distort. The integrity of the insulation remains intact even at the extremes of cryogenic service.

#### VERMIN RESISTANCE

FOAMGLAS® ONE™ insulation is resistant to vermin, as well as microbes and mold.

#### HIGH COMPRESSIVE STRENGTH

FOAMGLAS® ONE™ insulation can withstand loads which crush most other insulating materials. In a properly designed piping system, it eliminates the need for special treatment at pipe cradles. It provides a fire base for roof membranes, jacketing or vapor retarders, and can prolong their life.

#### ECOLOGICALLY FRIENDLY, SUSTAINABLE

FOAMGLAS® ONE™ insulation is free of CFC's and HCFC's and has been formally recognized as an ecologically friendly, sustainable construction material.

#### WORLDWIDE TECHNICAL SERVICE

Pittsburgh Corning's Technical Service Staff provides product, application and materials testing; standardized and customized application specifications; and onsite customer assistance and installation guidance.

### FOAMGLAS® ONE™ INSULATION SYSTEMS FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS

Pittsburgh Corning insulation systems provide solutions for a wide range of piping and equipment applications at operating temperatures from -268 to 482 °C (-450 to 900 °F).

- Cryogenic systems
- Low temperature pipe, equipment, tanks and vessels
- Medium and high temperature pipes and equipment
- Hot oil and hot asphalt storage tanks
- Heat transfer fluid systems
- Hydrocarbon processing systems
- Chemical processing systems
- Above ground and underground steam and chilled water piping
- Commercial piping and ductwork

#### STANDARD BLOCK DIMENSIONS

| STANDARD BLOCK DIMENSIONS |                                       |                                       |
|---------------------------|---------------------------------------|---------------------------------------|
| STANDARD FORMATS          | 450 x 600 mm<br>(18 x 24 inches)      | (18 x 36 inches)                      |
| STANDARD THICKNESSES      | 50 x 180 mm<br>10 mm increments       |                                       |
|                           | (2 – 7 inches)<br>(½ inch increments) | (3 - 8 inches)<br>(½ inch increments) |

Other thicknesses and formats may be provided to fill specialty orders.

**STANDARDS, CERTIFICATIONS\* AND APPROVALS**

FOAMGLAS® ONE™ Insulation is the only cellular glass that can be certified to confirm to the requirements of:

- ASTM C552 "Specification for Cellular Glass Thermal Insulation"
- ASTM C1639 "Standard Specification for Fabrication of Cellular Glass Piping and Tubing Insulation"
- Military Specification MIL-DLT-24244D (SH), with Special Corrosion and Chloride Requirement"
- Nuclear Regulatory Guide 1.36, ASTM C795, C692, C871
- Flame Spread Index 0, Smoke Developed Index 0 (UL 723, ASTM E 84), UL R2844; also classified by UL of Canada
- ISO 9001: 2008
- UL 1709, Rapid Rise Fire Tests of Protection Materials for Structural Steel
- UL Through Penetration Fire Stop Approved Systems UL1479/ASTM E814, please search the UL Database at <http://www.ul.com>. Once on this page click on CERTIFICATIONS on the left hand side. Under General Search click on UL FILE NUMBER and type in R15207 and then click SEARCH.
- Board of Steamship Inspection (Canada) Certificate of Approval No. 100 / FI-98
- General Services Administration, PBS (PCD; 15250, Public Building Services Guide Specification, "Thermal Insulation (Mechanical)"
- New York City Department of Buildings, MEA #138-81-M FOAMGLAS® insulation for piping, equipment, walls and ceilings
- New York State Uniform Fire Prevention and Building Code Department of state (DOS) 07200-890201-2013
- City of Los Angeles General Approval RR22534
- USGS Approval for Non-combustible Inspections
- GreenSpec® Listed. [www.greenspec.com](http://www.greenspec.com)
- EC-114.456 USCG 164.109/EC0736/114.456 Approval for marine use

FOAMGLAS® ONE™ insulation is identified by Federal Supply code for



| PHYSICAL AND THERMAL PROPERTIES              |   |   |   |
|--|---|---|---|
| PROPERTY                                     | ASTM METHOD                                       | SI  | ENGLISH   |
| DENSITY, NOMINAL                             | C303  | 117 kg / m <sup>3</sup>   | 7.3 lbs. / ft <sup>3</sup>  |
| ABSORPTION OF MOISTURE                       | C240  | < 0.2% by Vol   | < 0.2% by Vol   |
| WATER VAPOR PERMEABILITY                     | E96 Wet Cup                                       | 0.00 ng / Pa·s·m  | 0.00 perm·inch  |
| CHEMICAL RESISTANCE                          | Impervious to common acids and their fumes.       |   |   |
| CAPILLARITY                                  | None  |   |   |
| COMBUSTIBILITY & REACTION TO FIRE            | E136 E84  | Non Combustible<br>Flame Spread Index 0<br>Smoke Development Index 0                      |   |
| COMPOSITION                                  | Soda lime glass. Inorganic. No fibers or binders. |   |   |
| CORROSION, WATER SOLUBLE IONS AND PH         | C871 C692 C1617                                   | Acceptable for use with Stainless Steel Pass (0 Coupon Cracked) < DI Water                |   |
| COMPRESSIVE STRENGTH, BLOCK AVG              | C165 C240 C552                                    | 620 KPa   | 90 lbs / in <sup>2</sup>  |
| DIMENSIONAL STABILITY                        | Excellent – does not shrink or swell              |   |   |
| FLEXURAL STRENGTH, BLOCK AVG                 | C203 C240   | 480 KPa   | 70 lbs / in <sup>2</sup>  |
| HYGROSCOPICITY                               | No increase in weight at 90% relative humidity.   |   |   |
| COEFFICIENT OF LINEAR THERMAL EXPANSION, AVG | E228  | 25 to 300 °C<br>9.0 x 10 <sup>-6</sup> / K<br>-170 to 25 °C<br>6.6 x 10 <sup>-6</sup> / K | 75 to 575 °F<br>5.0 x 10 <sup>-6</sup> / F<br>-274 to 75 °F<br>3.7 x 10 <sup>-6</sup> / F |
| SERVICE TEMPERATURE                          | -268 to 482 °C                                    |   | -450 to 900 °F  |
| MODULUS OF ELASTICITY, APPROXIMATE           | C623  | 900 MPa   | 1.3 x 10 <sup>5</sup> lbs·in <sup>-2</sup>  |
| SPECIFIC HEAT                                | E1461   | 0.77 kJ / kg·K @ 25°C   | 0.18 BTU / lb · °F @ 77°F   |
| THERMAL DIFFUSIVITY                          | E1461   | 4.2 x 10 <sup>-7</sup> m <sup>2</sup> / s   | 0.016 ft <sup>2</sup> / hr  |

**THERMAL CONDUCTIVITY (LAMBDA) VALUES AT SELECT TEMPERATURES (ASTM C518, C177)<sup>1</sup>**

| TEMPERATURE                                  | °C (°F)                                   | 204 (400)    | 149 (300)    | 93 (200)     | 38 (100)     | 24 (75)      | 10 (50)      | -18 (0)      | -46 (-50)    | -73 (-100)   | -101 (-150)  | -160 (-275)  |
|--|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>ASTM C552 (Maximum)</b>                   | W / m K (BTU in / hr °F ft <sup>2</sup> ) | 0.084 (0.58) | 0.069 (0.48) | 0.058 (0.40) | 0.048 (0.33) | 0.045 (0.31) | 0.043 (0.30) | 0.039 (0.27) | 0.035 (0.24) | 0.032 (0.22) | 0.029 (0.20) | -            |
| <b>FOAMGLAS® ONE™ Insulation<sup>2</sup></b> | W / m K (BTU in / hr °F ft <sup>2</sup> ) | 0.078 (0.54) | 0.065 (0.45) | 0.054 (0.38) | 0.044 (0.31) | 0.042 (0.29) | 0.040 (0.28) | 0.036 (0.25) | 0.032 (0.22) | 0.028 (0.20) | 0.025 (0.18) | 0.020 (0.13) |

<sup>1</sup>Contact Pittsburgh Corning for assistance applying our design polynomial to your application.

<sup>2</sup>The average values shown represent expected "as manufactured" properties and should be considered design values for thickness calculation purposes.

For additional information on FOAMGLAS® ONE™ insulation or systems, please visit our website at [www.foamglas.com](http://www.foamglas.com) or contact Pittsburgh Corning at any of our worldwide offices.

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