



FIBERGLAS™ THERMAL INSULATING WOOL (TIW) TYPES I-HP & II-HP INSULATIONS

Fiberglas™ Thermal Insulating Wool (TIW) Types I-HP and II-HP insulations are off-white, non-combustible wool with resilient, inorganic glass fibers bonded with a thermosetting resin. TIW Type I-HP insulation is available in rolls; TIW Type II-HP insulation comes in batts.

Features

- Excellent thermal performance helps contribute to lower energy costs due to reduced heat loss — savings¹ may vary
- Easy to handle and install
- The insulation is easily impaled over welded studs or pins, or may be held in place with wire ties, metal lath, or lagging
- There is no tendency for pin-hole elongation under vibration situations — a frequent source of heat leaks in heavy products
- Large batts or blankets cover greater areas quickly, eliminating tedious block-by-block hand layup and drilling for studs in hard insulations

¹ Savings vary. Find out why in the seller's fact sheet on R-values. Higher R-values mean greater insulating power.

Standards, Codes Compliance

- ASTM C553, Mineral Fiber Blanket Thermal Insulation, Types I, II, III, IV, V, VI — Type I-HP and Type II-HP
- ASTM C612, Mineral Fiber Block & Board Thermal Insulation, Types IA, IB, II, III; Category 1 — TIW Type II-HP
- ASTM C795, Thermal Insulation for Use Over Austenitic Stainless Steel²
- Nuclear Regulatory Commission Guide 1.36, Non-Metallic Thermal Insulation²
- Mil. Spec. MIL-DTL-32585, Insulation, Thermal and Acoustic, Fibrous Glass; Types I and II; Forms 1 and 2
- Mil. Spec. MIL-I-22023D (Ships), Insulation Felt, Thermal and Sound Absorbing Felt, Fibrous Glass, Flexible, Types 1 & 2, Class 3 — TIW Type I-HP
- MIL-DTL-I-24244D (Ships) Insulation Material with Special Corrosion, Chloride, and Fluoride Requirements²; Type XVI
- U.S. Coast Guard Approval No. 164.109, Non-combustible Materials
- Complies to ASTM E136, Behavior of Materials in a Vertical Tube Furnace at 750°C (Non-combustible rating)
- CAN/CGSB-51.11 Class 4, Type 1 for TIW Type I-HP and Class 4, Type 2 for TIW Type II-HP.

² Preproduction qualification testing complete and on file. Chemical analysis of each production lot testing required for total conformance.

Physical Properties

| PROPERTY | TEST METHOD | VALUE |
|--|--------------------------------|---|
| Density | ASTM C167 | Type I-HP: 1.0 pcf (16.1 kg/m ³) Type II-HP: 2.5 pcf (40.1 kg/m ³) |
| Operating Temperature Range ³ | ASTM C411 | Rated to 1,000°F (538°C) |
| Water Vapor Sorption | ASTM C1104 | <5% by weight at 120°F (49°C), 95% R.H. |
| Fungi Resistance | ASTM C1338 | Meets requirements |
| CORROSION RESISTANCE | TEST METHOD | VALUE |
| Corrosion to Steel | ASTM C1617 | Meets Requirements |
| Stress Corrosion Evaluation on External Stress Corrosion Cracking Tendency of Austenitic Stainless Steel | ASTM C795 and ASTM C692 | Meets Requirements |
| Chemical Analysis for Cl ⁻ , F ⁻ , Na ⁺ , SiO ₃ | ASTM C795 and ASTM C871 | Results fall within acceptability limits |
| FIRE | TEST METHOD | VALUE |
| Surface Burning Characteristics ⁴ | UL 723, ASTM E84, CAN/ULC-S102 | UNFACED: Flame Spread Index 0 Smoke Developed Index 0 |

³ Maximum allowable thickness at 1,000°F (538°C); Type I-HP — 8.5 inches (216 mm); Type II-HP — 6 inches (152 mm).

⁴ The surface burning characteristics of these products have been determined in accordance with UL 723, ASTM E84, and CAN/ULC-S102. Values are reported to the nearest 5 rating.

Thermal Conductivity⁵

| MEAN TEMPERATURE °F | k (Btu·in/hr·ft ² ·°F) | | MEAN TEMPERATURE °C | λ W/m·°C | |
|---------------------|-----------------------------------|------------|---------------------|-----------|------------|
| | TYPE I-HP | TYPE II-HP | | TYPE I-HP | TYPE II-HP |
| 75 | 0.24 | 0.22 | 25 | 0.034 | 0.031 |
| 100 | 0.25 | 0.23 | 50 | 0.039 | 0.034 |
| 200 | 0.33 | 0.28 | 100 | 0.049 | 0.041 |
| 300 | 0.42 | 0.34 | 150 | 0.060 | 0.049 |
| 400 | 0.53 | 0.41 | 200 | 0.075 | 0.059 |
| 500 | 0.69 | 0.51 | 250 | 0.095 | 0.071 |
| 600 | 0.88 | 0.63 | 300 | 0.119 | 0.086 |

⁵ Apparent thermal conductivity values determined in accordance with ASTM practice C1045 with data obtained by ASTM test method C177. Values are nominal, subject to normal testing and manufacturing tolerance.

Applications

- Fiberglas™ TIW Type I-HP Insulation is used in applications up to 1,000°F (538°C) at maximum recommended thickness requiring a lightweight insulation, such as that used in panel systems, flexible wrap, industrial ovens, or surfaces having irregularities. Its low compressive strength makes it unsuitable for use as a base wool for metal mesh blankets.
- Fiberglas™ TIW Type II-HP Insulation is especially suitable for use in metal mesh blankets and for use on boilers, vessels, and many other types of industrial equipment operating at temperatures up to 1,000°F (538°C) at maximum recommended thickness. It may also be used in panel systems for precipitators, ducts, and breechings where more compressive resistance than Fiberglas™ TIW Type I-HP Insulation is needed.

Technical Information

TIW Type I-HP and Type II-HP are usually impaled over welded pins on flat surfaces. For irregular surfaces, they are cut in segments and impaled over welded pins to hold in place.

See Installation Instruction Pub No. 10025339.

Thermal Performance, ASTM C680⁶

| | THICKNESS | | OPERATING TEMPERATURE, °F (°C) | | | | | | | |
|----------------|-----------|------|--------------------------------|-----|-----------|-----|-----------|-----|-------------|-----|
| | IN. | (MM) | 400 (204) | | 600 (316) | | 800 (427) | | 1,000 (538) | |
| | | | HL | ST | HL | ST | HL | ST | HL | ST |
| TIW Type I-HP | 1 | 25 | 109 | 182 | 241 | 275 | 435 | 394 | 699 | 533 |
| | 2 | 51 | 61 | 143 | 136 | 201 | 249 | 281 | 409 | 379 |
| | 3 | 76 | 43 | 126 | 95 | 171 | 174 | 230 | 287 | 305 |
| | 4 | 102 | 32 | 116 | 73 | 153 | 133 | 201 | 221 | 262 |
| | 5 | 127 | 27 | 110 | 59 | 141 | 108 | 182 | 179 | 233 |
| | 6 | 152 | 22 | 106 | 49 | 133 | 91 | 168 | 151 | 213 |
| | 7 | 178 | 19 | 102 | 43 | 126 | 79 | 157 | 130 | 198 |
| | 8 | 203 | 17 | 99 | 38 | 121 | 69 | 150 | 114 | 186 |
| TIW Type II-HP | 1 | 25 | 81 | 160 | 167 | 225 | 289 | 306 | 453 | 404 |
| | 2 | 51 | 45 | 128 | 92 | 167 | 159 | 219 | 251 | 282 |
| | 3 | 76 | 31 | 115 | 63 | 145 | 109 | 183 | 173 | 229 |
| | 4 | 102 | 23 | 107 | 48 | 131 | 84 | 162 | 132 | 198 |
| | 5 | 127 | 19 | 109 | 39 | 123 | 68 | 148 | 106 | 180 |
| | 6 | 152 | 16 | 99 | 33 | 117 | 57 | 139 | 89 | 167 |

6 The above table provides approximate heat loss values (HL), Btu/hr-ft², and surface temperatures (ST), °F, for flat surfaces. Values are based on horizontal heat flow, vertical flat surface, 80°F ambient temperature, still air, and weathered aluminum jacket. To convert heat loss values to W/m², multiply values by 3.15. To convert surface temperatures, use the formula: °C = (°F-32)/1.8.

Sound Absorption Coefficients

ASTM C423; Type A Mounting⁷ – Material placed against solid backing

| PRODUCT TYPE | THICKNESS | | 1/3 OCTAVE BAND CENTER FREQUENCIES (Hz) | | | | | | |
|--------------|-----------|------|---|------|------|------|------|------|------|
| | INCHES | (mm) | 125 | 250 | 500 | 1000 | 2000 | 4000 | NRC |
| TIW Type I | 1 | 25 | 0.08 | 0.38 | 0.76 | 0.81 | 0.92 | 0.96 | 0.75 |
| | 2 | 50 | 0.18 | 0.75 | 1.10 | 1.06 | 1.00 | 1.01 | 1.00 |
| TIW Type II | 1 | 25 | 0.12 | 0.46 | 0.95 | 1.07 | 1.04 | 1.06 | 0.90 |
| | 2 | 50 | 0.32 | 1.19 | 1.25 | 1.17 | 1.11 | 1.13 | 1.20 |

7 Nominal samples were measured in accordance with ASTM C423. These measured absorption coefficients were adjusted to values representative of the product with mean specification properties. While these values are an accurate representation of our product, they are for design approximations only. Production, testing, and application variabilities will alter results. Specific designs should be evaluated in end-use configuration.

Availability

TIW TYPE I-HP (ROLLS ONLY)

| THICKNESS (IN.) | WIDTH (IN.) | LENGTH (FT.) | NUMBER OF LAYERS |
|-----------------|----------------|--------------|------------------|
| 1" | 24", 36" & 48" | 87 | 2 layers |
| 1.5" | | 58 | 2 layers |
| 2" | | 87 | 1 layer |
| 3" | | 58 | 1 layer |
| 4" | | 44 | 1 layer |

TIW TYPE II-HP (BATTS ONLY)

| THICKNESS (IN.) | WIDTH (IN.) | LENGTH (IN.) | NUMBER OF LAYERS |
|----------------------------|-------------|--------------|------------------|
| 1" to 4" (1/2" increments) | 24" & 36" | 48" | N/A |

Certifications and Sustainable Features

- Certified by SCS Global Services to contain an average of 53% recycled glass content, 31% pre-consumer, and 22% post-consumer



Environmental and Sustainability

Owens Corning is a worldwide leader in building material systems, insulation, and composite solutions, delivering a broad range of high-quality products and services. Owens Corning is committed to driving sustainability by delivering solutions, transforming markets, and enhancing lives. More information can be found at www.owenscorning.com.

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SCS Global Services provides independent verification of recycled content in building materials and verifies recycled content claims made by manufacturers. For more information, visit www.SCSglobalservices.com.

Notes

For additional information, refer to the Safe Use Instruction Sheet (SUIS) found in the SDS Database via <http://sds.owenscorning.com>. Savings¹ vary. Find out why in the seller's fact sheet on R-values. Higher R-values mean greater insulating power.

OWENS CORNING INSULATING SYSTEMS, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OH 43659 USA

1-800-GET-PINK®
www.owenscorning.com