



# 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 – savings 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
- Can be used in direct contact with steel, copper, and aluminum without corrosive effects

## 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 Steel<sup>1</sup>
- Nuclear Regulatory Commission Guide 1.36, Non-Metallic Thermal Insulation<sup>1</sup>
- 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 Requirements<sup>1</sup>; Type XVI
- U.S. Coast Guard Approval No. 164.109, Non-combustible Materials
- CAN/CGSB-51.11 – Type 1, Class 4 – Fiberglas™ TIW Types I-HP & II-HP Insulation

<sup>1</sup> Preproduction qualification testing complete and on file. Chemical analysis of each production lot testing required for total conformance.

## 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 does not make it suitable 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.

## Physical Properties

PROPERTY	TEST METHOD	VALUE
Density	ASTM C167	Type I-HP: 1.0 pcf (16.1 kg/m <sup>3</sup> ) Type II-HP: 2.5 pcf (40.1 kg/m <sup>3</sup> )
Operating Temperature Range <sup>2</sup>	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 Copper and Aluminum	ASTM C665	Pass - copper and aluminum
Corrosion to Steel	ASTM C1617	Pass
Stress Corrosion Evaluation on External Stress Corrosion Cracking Tendency of Austenitic Stainless Steel	ASTM C795 and ASTM C6921	Pass
Chemical Analysis for Cl <sup>-</sup> , F <sup>-</sup> , Na <sup>+</sup> , SiO <sub>3</sub>	ASTM C795 and ASTM C8711	Results fall within acceptability limits
FIRE	TEST METHOD	VALUE
Surface Burning Characteristics <sup>3</sup>	UL 723, ASTM E84, CAN/ULC-S102	UNFACED: Flame Spread Index 0 Smoke Developed Index 0

<sup>2</sup> Maximum allowable thickness at 1,000°F (538°C); Type I-HP – 8.5 inches (216 mm); Type II-HP – 6 inches (152 mm).

<sup>3</sup> 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 Conductivity<sup>4</sup>

MEAN TEMPERATURE °F	k (Btu·in/hr·ft <sup>2</sup> ·°F)		MEAN TEMPERATURE °C	λ W/m·°C	
	TYPE I-HP	TYPE II-HP		TYPE I-HP	TYPE II-HP
75	0.23	0.21	24	0.033	0.030
100	0.25	0.22	38	0.037	0.032
200	0.32	0.27	93	0.046	0.039
300	0.41	0.33	149	0.059	0.048
400	0.53	0.41	204	0.077	0.060
500	0.68	0.51	260	0.098	0.074
600	0.88	0.63	316	0.127	0.091

<sup>4</sup> 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.

## 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 C680<sup>5</sup>

	THICKNESS		OPERATING TEMPERATURE, °F (°C)							
			400 (204)		600 (316)		800 (427)		1,000 (538)	
	IN.	(MM)	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

5 The above table provides approximate heat loss values (HL), Btu/hr·ft<sup>2</sup>, 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/m<sup>2</sup>, multiply values by 3.15. To convert surface temperatures, use the formula: °C = (°F-32)/1.8.

## Sound Absorption Coefficients

ASTM C423; Type A Mounting<sup>6</sup> – 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

6 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

ROLL WIDTH SIZES (in.)	TIW TYPE I-HP (ROLLS)		
	THICKNESS (in.)	LENGTH (ft.)	NO. OF LAYERS
24	1.0	87.00	2 layers
36	1.5	58.00	2 layers
48	2.0	87.00	1 layers
	3.0	58.00	1 layers
	4.0	44.00	1 layers
TYPE II-HP (BATTS)			
	THICKNESS	WIDTH X LENGTH	
	1" to 4" at 1/2" increments	24 x 48 36 x 48	

## 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](http://www.owenscorning.com).

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## Notes

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

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