



Arabian Fiberglass Insulation Company Ltd.  
J.V. of Zamil Industrial & Owens Corning Corp.

## Thermacon Pre-Engineered Metal Building Insulation

Technical Data Sheet  
Product Code: **MBI**



### DESCRIPTION

**Thermacon Pre-Engineered Metal Building Insulation** is a highly efficient, lightweight, strong, resilient, and easy to handle flexible blanket insulation composed of fine, stable and uniformly textured inorganic glass fibers bonded together by a non-water soluble and fire-retardant thermosetting and heat resistant resin. It is free from coarse fibers and shot due to its mineral composition.

### APPLICATION

**Thermacon Pre-Engineered Metal Building Insulation** is manufactured specifically for use in the roof and side walls of commercial, industrial, residential, agricultural and poultry farms metal building construction. This insulation greatly reduces heat gain or loss through the building envelope. It will not rot, disintegrate or slump.

### STANDARD NOMINAL DENSITY

10 – 12 kg/m<sup>3</sup> – 0.625 – 0.75 lb/ft<sup>3</sup>

Nominal Manufacturing Specifications.  
Check for availability of other dimensions and densities.

### FACING

**Thermacon Pre-Engineered Metal Building Insulation** is designed and factory-laminated to a choice of functional finishes to provide attractive interiors, abuse resistance, and assistance in the control of moisture or vapor condensation. **Thermacon Pre-Engineered Metal Building Insulation** is available with one side factory-applied Aluminum Foil Glass Reinforced Kraft Paper Laminate (FRK), White Metalized Scrim Kraft (WMSK) or other specific vapor barrier facings.

The use of the proper facing helps to preserve the inherent fire safety of metal buildings. These facings brighten the building interiors due to their high light reflectance, reduce the cost of interior lighting, contribute to an effective vapor barrier and to the control of condensation and dripping moisture.

A 50mm (2 inch) stapling and taping overlap flange on one side or both sides of these facings is available. The facings are also available with UL fire resistant rating.

### Normal Thermal Conductivity (ASTM C 518, B.S. 874)

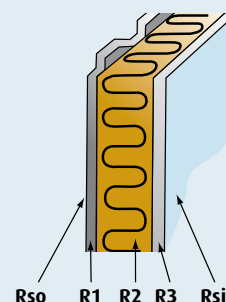
"K" or "λ" = 0.040 W/m.°C or 0.28 Btu.in./ft<sup>2</sup>.hr.°F at 24°C or 75°F mean temperature.

### R-Values of Standard Sizes Available

Thickness		Thermal Resistance (R)		Dimensions Width Length	
mm	inch	m <sup>2</sup> .°C/W	hr.ft <sup>2</sup> .°F Btu	mm	m
25	1	0.63	4	900-100	10-36
38	1 ½	0.95	5		
50	2	1.25	7		
64	2 ½	1.60	9		
75	3	1.88	11	36-44	ft
89	3 ½	2.23	13		
100	4	2.50	14		
150	6	3.75	21		

### THERMAL TRANSMITTANCE (U VALUE)

Thermal transmittance is the rate of heat flow through unit area of a wall system when unit temperature difference exists between air on each side of the structure. The U value is the reciprocal of the sum of the resistances of the component parts of the structure plus the resistance of the surfaces and any cavities within the structure.



$$U = \frac{1}{\text{Total "R"}}$$

$$\text{Here } U = \frac{1}{R_{so} + R_1 + R_2 + R_3 + R_{si}}$$

- R<sub>so</sub> = Outside surface resistance
- R<sub>1</sub> = External sheeting
- R<sub>2</sub> = AFICO insulation
- R<sub>3</sub> = Internal sheeting or lining if any
- R<sub>si</sub> = Inside surface resistance



\* Standard Products and Sizes

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## Performance & Physical Characteristics

### Thermal Resistance "R" Value (ASTM C 167)

"R" is a measure of the resistance to heat flow of a material of any given thickness. ("R" = m<sup>2</sup>. °C/W or hr. ft<sup>2</sup>. °F/Btu.)

$$R = \frac{T}{K} \quad \text{where "T" = thickness} \\ \text{and "K" or "λ" = thermal conductivity}$$

### Thermal Conductance, 'C' - Value (ASTM C 518, ASTM C 177)

$$C = \frac{1}{R} = W/m^2 \cdot ^\circ C \text{ or } Btu/hr \cdot ft^2 \cdot ^\circ F$$

It is the ability of the product to conduct heat.

### Working Temperature Limitations (ASTM C 411)

-4°C to +260°C. At excessive temperatures, a limited migration of binder may occur in the insulation in contact with the hot surface. This in no way impairs the performance of the insulation.

### Alkalinity (ASTM C 871)

pH 9

### Corrosiveness (ASTM C 665)

Chemically inert. Will not cause or accelerate corrosion of steel, stainless steel, copper or aluminum, due to its particular inorganic and mineral composition.

### Mold Growth (ASTM D 2020, UL 181, ASTM C 991)

Does not breed or sustain mold, fungus, bacteria or rodents.

### Moisture Absorption (ASTM D-07 B, ASTM C 553)

In conditions of 95% relative humidity at 49°C for 96 hours, moisture absorption is less than 0.2% by volume, when tested in accordance with ASTM C 533. Thermacon fiberglass products do not absorb moisture from the ambient air nor water by capillary attraction, only water under pressure can enter the insulation products but that will quickly dry out owing to the material's open cell structure.

### Vapor Permeability (ASTM E 96 A)

See Table 3

### Puncture Resistance (ASTM D 781)

FRK 25 UNITS  
WMSK 25 UNITS

### Surface Burning Characteristics (UL 723, ASTM E 84, ASTM E 136)

Base glass fiber is non-combustible when tested to ASTM E 84.

Facing	Flame Spread	Smoke Developed	Fuel Contributed
FRK	25	10	0
WMSK	20	30	0

### Compressive Strength

PCF AT 10% DEFORMATION 5  
PCF AT 25% DEFORMATION 10

### Fire Properties

B.S. 476 PART 4 – Non-combustible  
B.S. 476 PART 5 – Ignitability  
B.S. 476 PART 6 – Fire propagation  
B.S. 476 PART 7 – Surface spread of flame  
Class 'O' fire rating to the building regulations section E15

### Specification Compliance

Thermacon Pre-Engineered Metal Building Insulation complies with the property requirements of the following specifications:

- U.S. Federal Specification HH-1-521 F,
- U.S. Federal Specification HH-1-558 B, TYPE I, Class 6 B-1
- TIMA Standard 202
- ASTM C 423
- DCL ASTM - C 533 - C 547 - C 612 - C 665
- CE-EN 13162

### Overall Heat Transmission Coefficient:

Table 1

Insulation thickness inches	Actual "K"	Manufacturers data for uncompressed insulation		MBMA/TMA test values**			
		Theoretical "R"	Theoretical "U"	Insulation compressed over girts and purlins, fasteners on 12" centers		Insulation compressed over girts and purlins, fasteners on 6" centers	
		"R"	"U"	"R"	"U"	"R"	"U"
1 ½	0.28	5.36	.18	4.12	.20	4.06	.21
2	0.28	7.14	.14	5.23	.17	4.64	.19
3	0.28	10.71	.10	6.89	.13	6.11	.15
4	0.28	14.29	.07	7.60	.12	6.45	.14

### Sound Transmission Loss in dB Metal Building Walls

Table 2

Construction Type	Octave Band Center Frequencies, Hz						
	125	250	500	1000	2000	4000	NRC
Metal Building wall 26 gauge	12	14	15	21	21	25	20
Metal building wall + 2" insulation	11	15	16	29	31	37	24
Metal building wall+ 3" insulation	12	16	18	31	32	39	25
Metal building wall + 4" insulation	11	17	21	34	35	42	27



## Performance & Physical Characteristics

### UL Facings Available

Table 3

Type	Light Reflectance	Perm Rating	Sound Absorption Coefficients (Hz)* at Octave Band Center Frequencies						NRC	Insulation Thickness		"R"	Recommended temperature limitations (-6°C to + 60°C)
			125	250	500	1000	2000	4000		mm	inch		
FRK	89%	.02	.33	.49	.99	.60	.30	.23	.60	50	2	7	25°F - 150°F
WMSK heavy duty	80%	.02	.35	.51	.99	.68	.35	.30	.60	75	3	11	20°F - 140°F
WMSK heavy duty	80%	.02	.33	.48	.99	.86	.44	.33	.70	100	4	14	20°F - 140°F

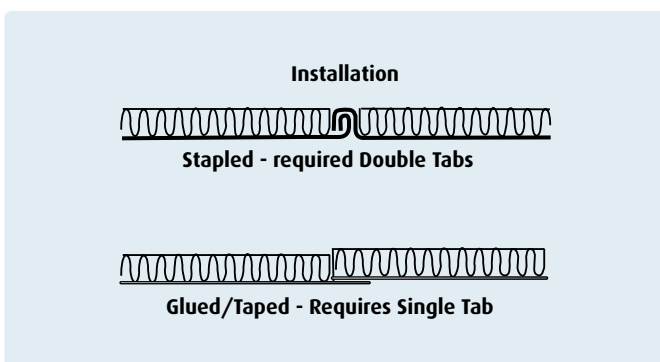
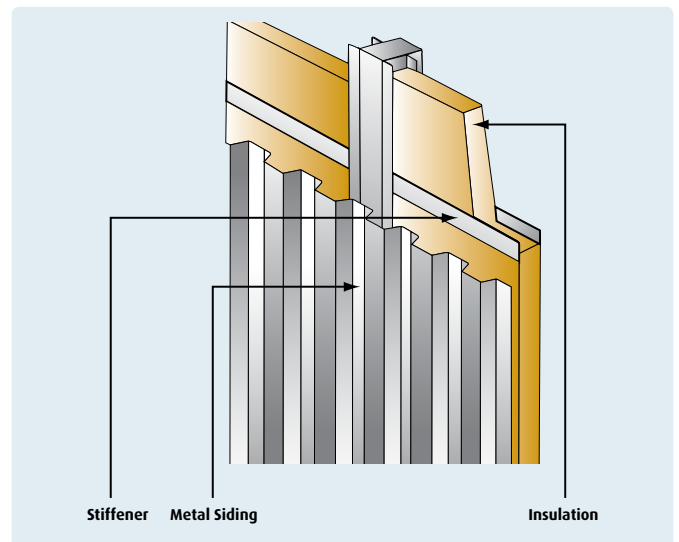
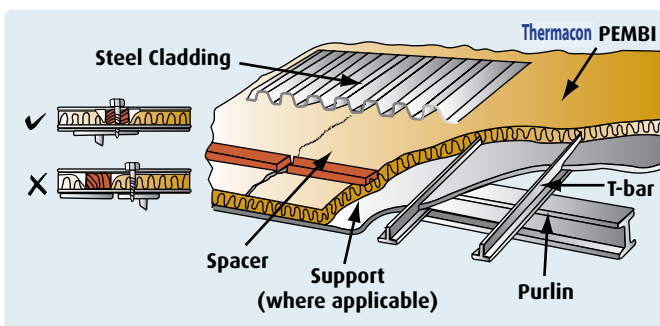
\* No. 7 mounting-framing 400mm (16" air space) backed with 24 gauge sheet using 38mm (1 1/2") thick insulation.

### Application Guidelines

Several methods are used to insulate metal buildings. The usual method is to apply the insulation over the structural members (purlins and girts) and inside the exterior panels. This method generally accommodates single layer insulation to R-13. Methods are also used to apply insulation in metal building roofs between purlins so as to accommodate greater insulation thickness and better thermal performance.

In some cases, two insulation layers are necessary or desirable. In such case, **Thermacon Pre-Engineered Metal Building Insulation** provides an economical unfaced second layer. The table below shows how double layer application may be used to achieve desired R-values.

Desired R-Value	First layer (Faced)	Second Layer (Unfaced)
16	R = 7	R = 9
19	R = 7	R = 12
25	R = 7	R = 18
31	R = 7	R = 24





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## MAINTENANCE

No maintenance is required. **Thermacon Pre-Engineered Metal Building Insulation** has a high resistance to accidental damage from knocks and handling during installation and maintenance. Dimensionally stable under varying conditions of temperature and humidity, rot-proof, odorless, non-hygroscopic and will not sustain vermin or fungus due to its inorganic and mineral compositions.

The product will maintain its thermal properties throughout the lifetime of the construction and will not age. **Thermacon** fibreglass is non toxic and not hazardous to health.

## STORAGE

To avoid moisture in the building construction, **Thermacon** insulation products stored outside must be kept dry. We recommend **Thermacon** products to be always stored in covered and dry areas. **Thermacon** is not liable for the damage resulting from inadequate utilization, loading and off loading and mishandling of its products.

## WARRANTY

See manufacturer's General Terms and Conditions of Sale. As **Thermacon** and/or OC has no control over installation design, installation workmanship, accessory materials, or conditions of application, **Thermacon** and/or OC does not warrant the performance or results of any installation containing their products. This warranty disclaimer includes all implied warranties, including the warranties or merchantability and fitness for a particular purpose.

Arabian Fibreglass Insulation Company **Thermacon** reserves the right to alter product specifications without prior notice, as part of its policy of continued development and improvement. The installation methods described in this leaflet are not compulsory. The choice of **Thermacon** materials and methods of fixing are the decision of the specifier, consultant or contractor. For further information or advice on specification of **Thermacon** products, contact your local sales office.

## AVAILABILITY

Manufactured by **Arabian Fibreglass Insulation Company, Ltd.** (AFICO), member of **Zamil Industrial**, with headquarters and production facilities located in Dammam, Saudi Arabia, under license from and utilizing the manufacturing specifications and technology of **Owens-Corning Corporation** (OC), Toledo, Ohio, U.S.A.

Marketed throughout Saudi Arabia, the G.C.C. countries, the Middle East and the Far East. **Thermacon** products are available directly from **Thermacon** as well as through a vast and reliable network of local distributors.

**Special products are manufactured on request.**

## Thermacon PRODUCTS

## PRODUCTS CODE

Acoustical Ceiling Panels	ACP
Blanket Insulation	BKT
HD Series Blanket Insulation	HDB
Board Insulation	BD
Roof Insulation	RI
Roof Deck Board Insulation	RD
Cavity Wall Insulation	CWI
<b>Pre-Engineered Metal Building Insulation</b>	<b>MBI</b>
Faced Duct Wrap	FDW
Duct Liner	DL
Duct Liner Board	DLB
Mechanical Board Insulation	MBD
Heavy Density Pipe Insulation	PI
Pipe Wrap Insulation	PWI
Thermal Insulating Wool	TIW
Quiet Liner	AQL
Woven Facing	AWF
Prefabricated Duct Board	PDB

**For more information call the insulation professionals:**



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ISO 14001

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