

**GRACE**  
**Construction Products**

**1. Product Name**

ZONOLITE® Masonry Insulation

**2. Manufacturer**

Grace Construction Products  
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**3. Product Description**

**BASIC USE**

ZONOLITE Masonry Insulation is free flowing vermiculite used to insulate masonry wall cores and cavities. It also increases the fire resistance rating and Sound Transmission Classification (STC) of the wall system.

**COMPOSITION & MATERIALS**

ZONOLITE Masonry Insulation, available in 4 cf (0.11 m<sup>3</sup>) bags, is lightweight, free flowing, inorganic vermiculite, specially treated for water repellency. It has a dry loose weight density of 4.5 - 7.0 pcf (72 - 112 kg/m<sup>3</sup>), and is capable of supporting its own weight, so it will not settle. It is fire resistant, with a fusion point of approximately 2200°F (1204°C), rotproof and vermin-proof.

**LIMITATIONS**

Where average interior relative humidity exceeds 50%, a vapor barrier is recommended on the exterior side of the interior wythe of the cavity wall or composite masonry wall system.

**4. Technical Data**

**APPLICABLE STANDARDS**

American Society for Testing & Materials (ASTM)

- ASTM E84-96a - *Surface Burning Characteristics of Building Materials*

**APPROVALS**

Underwriters' Laboratories, Inc. (UL) *Fire Resistance Directory*, approved designs include:

- Design U-901 • Design U-904
- Design U-905 • Design U-907

**PHYSICAL/CHEMICAL PROPERTIES**

Upon request, written certification will be provided that ZONOLITE Masonry Insulation meets or exceeds the following standards:

ASTM C516-80 - *Vermiculite Loose Fill Thermal Insulation, Type II*

Federal Housing Authority (FHA) - *FHA Bulletin UM-30*

Federal Specification for Insulation, Thermal (Vermiculite) - Fed Spec HH-585C, superseded by ASTM C516-80 effective March 31, 1983

National Concrete Masonry Association (NCMA) - *General Performance Criteria*

**HEAT TRANSMISSION**

Tables 1, 2, 4 and 5 provide system thermal design values, and measured values where noted, for thermal transmittance (U-value) and thermal resistance (R-value) for common constructions insulated with ZONOLITE Masonry Insulation. A manufacturer's insulation fact sheet is available upon request.

**FIRE RESISTANCE RATING**

ZONOLITE Masonry Insulation will not burn. When tested in accordance with the ASTM E84 Tunnel Test, ZONOLITE Masonry Insulation received the following ratings:

- Flame spread - 0
- Fuel contributed - 0
- Smoke developed - 0

UL Designs U-901, U-904, U-905, and U-907 will improve to a minimum 4-hour rated wall when filled with ZONOLITE Masonry Insulation. Due to its outstanding performance in the UL Fire Wall Test, 6-hour rated walls can be achieved when filled with ZONOLITE Masonry Insulation.

**SOUND TRANSMISSION**

ZONOLITE Masonry Insulation has an STC rating of 51, which means noise transmission is reduced by 24% to a level where room-to-room conversation is inaudible. Test results are available upon request.

**WATER PERMEANCE**

Specially treated ZONOLITE Masonry Insulation eliminates moisture condensation. Tests conducted by the Structural Clay Products Research Foundation on ZONOLITE Masonry Insulation in cavity walls showed virtually no water permeation.

Further, there is no need for a vapor barrier when the average indoor relative humidity does not exceed 50% (*FHA Bulletin UM-30*).

**APPROXIMATE COVERAGE**

When installed according to manufacturer's recommendations, approximate coverage can be calculated per Table 5.

**SAFETY**

Health and safety information is available on this product. Contact Grace Construction Products for a Material Safety Data Sheet (MSDS).

**5. Installation**

**PREPARATORY WORK**

Block joints at pilasters or other vertical members should be mortared, and weep holes should be filled with glass fiber, rope or copper screen to prevent insulation leakage.

**METHOD**

Insulation should be poured from the bag or hopper directly into the concrete block core or wall cavity. Pours can be made at any interval, but not to exceed 20' (6.1 m) in height, without requiring bridging. Rodding and tamping are not required.

**6. Availability & Cost**

**AVAILABILITY**

Strategically located warehouses and a network of distributors carry ZONOLITE Masonry Insulation for prompt delivery to project sites. Contact a Grace Masonry Products representative for ordering and delivery information.

**COST**

ZONOLITE Masonry Insulation is competitively priced. For specific information, contact a Grace representative.

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**7. Warranty**

Grace products are warranted to meet published specifications at time of delivery. For further warranty information, contact a Grace representative.

**8. Maintenance**

ZONOLITE Masonry Insulation can be stored indefinitely and, when installed with manufacturer's recommendations, it will not require maintenance.

**9. Technical Services**

Support is provided by full-time, technically-trained Grace Masonry Products representatives and technical personnel. They are supported by a central research and development technical services staff.

**10. Filing Systems**

- Architects' First Source for Products
- Additional product information is available from the manufacturer.

TABLE 1 THERMAL PROPERTIES OF ZONOLITE - CMU SINGLE-WYTHE WALLS

Wall thickness	Types of block	R-value ft <sup>2</sup> ·h·°F/Btu (m <sup>2</sup> ·K/W)	U-value Btu/(ft <sup>2</sup> ·h·°F) W/(m <sup>2</sup> ·K)
6" (152 mm)	Lightweight uninsulated	2.5 (0.44)	.40 (2.27)
	insulated	3.8 (0.67)	.26 (1.48)
8" (203 mm)	Lightweight uninsulated	3.0 (0.53)	.33 (1.87)
	insulated	5.9 (1.04)	.17 (0.97)
8" (203 mm)	Heavyweight uninsulated	2.1 (0.37) <sup>1</sup>	.48 (2.73)
	insulated	3.1 (0.55) <sup>1</sup>	.32 (1.82)
12" (305 mm)	Lightweight uninsulated	3.3 (0.58)	.30 (1.70)
	insulated	8.0 (1.41) <sup>1</sup>	.12 (0.68)
12" (305 mm)	Heavyweight uninsulated	2.3 (0.40) <sup>1</sup>	.44 (2.50)
	insulated	4.2 (0.74) <sup>1</sup>	.24 (1.36)

<sup>1</sup> Measured values

TABLE 2 THERMAL PROPERTIES OF ZONOLITE - CMU WALL WITH BRICK VENEER

Backup CMU thickness	Type of CMU	Exterior wythe			
		Face brick 4" (102 mm)		Common brick 4" (102 mm)	
		R-value ft <sup>2</sup> ·h·°F/Btu (m <sup>2</sup> ·K/W)	U-value Btu/(ft <sup>2</sup> ·h·°F) W/(m <sup>2</sup> ·K)	R-value ft <sup>2</sup> ·h·°F/Btu (m <sup>2</sup> ·K/W)	U-value Btu/(ft <sup>2</sup> ·h·°F) W/(m <sup>2</sup> ·K)
6" (152 mm)	Lightweight uninsulated	3.0 (0.53)	.33 (1.87)	3.3 (0.58)	.30 (1.70)
	Lightweight insulated	4.3 (0.76)	.23 (1.31)	4.6 (0.81)	.22 (1.25)
8" (203 mm)	Lightweight uninsulated	3.5 (0.62)	.29 (1.65)	3.8 (0.66)	.26 (1.48)
	Lightweight insulated	6.3 (1.11)	.16 (0.91)	6.7 (1.18)	.15 (0.85)
8" (203 mm)	Heavyweight uninsulated	2.4 (0.42)	.42 (2.39)	2.8 (0.49)	.36 (2.04)
	Heavyweight insulated	3.2 (0.56)	.31 (1.76)	3.6 (0.63)	.28 (1.59)

TABLE 3 NUMBER OF 4 CF (0.11 M<sup>3</sup>) BAGS PER 1000 SF (93 M<sup>2</sup>) OF WALL AREA

Type	No. of bags
8" (203 mm) CMU	68
12" (305 mm) CMU	121
1" (25 mm) cavity	21
2" (51 mm) cavity	42
2½" (64 mm) cavity	50
4" (102 mm) cavity	95



TABLE 4 THERMAL PROPERTIES OF ZONOLITE – CAVITY WALLS WITH 4" (102 MM) EXTERIOR WYTHE

Interior wythe thickness	Type of Construction		Cavity Dimension			
			2½" (64 mm)		4½" (114 mm)	
			R-value ft²·h·°F/Btu (m²·K/W)	U-Value Btu/(ft²·h·°F) W/(m²·K)	R-value ft²·h·°F/Btu (m²·K/W)	U-Value Btu/(ft²·h·°F) W/(m²·K)
4" (102 mm)	Lightweight CMU	Uninsulated	3.8 (0.67)	.27 (1.53)	3.8 (0.67)	.27 (1.53)
		Cavity Insulated	8.8 (1.55)	.11 (0.62)	13.6 (2.39)	.07 (0.40)
4" (102 mm)	Heavyweight CMU	Uninsulated	3.0 (0.53)	.34 (1.93)	3.0 (0.53)	.34 (1.93)
		Cavity Insulated	8.0 (1.41)	.12 (0.68)	12.8 (2.25)	.08 (0.45)
4" (102 mm)	Concrete (Cinder) Block or Clay Tile	Uninsulated	3.4 (0.60)	.30 (1.70)	3.4 (0.60)	.30 (1.70)
		Cavity Insulated	8.4 (1.48)	.12 (0.68)	13.2 (2.32)	.08 (0.45)
4" (102 mm)	Face Brick	Uninsulated	2.7 (0.48)	.37 (2.10)	2.7 (0.48)	.37 (2.10)
		Cavity Insulated	7.7 (1.36)	.13 (0.74)	12.5 (2.20)	.08 (0.45)
4" (102 mm)	Common Brick	Uninsulated	3.1 (0.55)	.33 (1.87)	3.1 (0.55)	.33 (1.87)
		Cavity Insulated	8.1 (1.43)	.12 (0.68)	12.9 (2.27)	.08 (0.45)
6" (152 mm)	Lightweight CMU	Uninsulated	3.9 (0.69)	.26 (1.48)	3.9 (0.69)	.26 (1.48)
		Cavity Insulated	8.9 (1.57)	.11 (0.62)	13.7 (2.41)	.07 (0.40)
		Cavity & Block Insulated	10.3 (1.81)	.10 (0.57)	15.1 (2.66)	.07 (0.40)
8" (203 mm)	Lightweight CMU	Uninsulated	4.4 (0.77)	.23 (1.31)	4.4 (0.77)	.23 (1.31)
		Cavity Insulated	9.5 (1.67)	.11 (0.62)	14.3 (2.52)	.07 (0.40)
		Cavity & Block Insulated	12.3 (2.16)	.08 (0.45)	17.1 (3.12)	.06 (0.34)

TABLE 5 THERMAL PROPERTIES OF ZONOLITE – CAVITY WALLS WITH LIGHTWEIGHT 4" (102 MM) EXTERIOR WYTHE

Interior wythe thickness	Type of concrete		Cavity Dimension			
			2½" (64 mm)		4½" (114 mm)	
			R-value ft²·h·°F/Btu (m²·K/W)	U-Value Btu/(ft²·h·°F) W/(m²·K)	R-value ft²·h·°F/Btu (m²·K/W)	U-Value Btu/(ft²·h·°F) W/(m²·K)
4" (102 mm)	Lightweight Concrete Block	Uninsulated	4.8 (0.84)	.21 (1.19)	4.8 (0.84)	.21 (1.19)
		Cavity Insulated	9.9 (1.74)	.10 (0.57)	14.7 (2.59)	.07 (0.40)
4" (102 mm)	Heavyweight Concrete Block	Uninsulated	4.0 (0.70)	.25 (1.42)	4.0 (0.70)	.25 (1.42)
		Cavity Insulated	9.1 (1.60)	.11 (0.62)	13.9 (2.45)	.07 (0.40)
4" (102 mm)	Concrete (Cinder) Block or Clay Tile	Uninsulated	4.4 (0.77)	.23 (1.31)	4.4 (0.77)	.23 (1.31)
		Cavity Insulated	9.5 (1.67)	.11 (0.62)	14.3 (2.52)	.07 (0.40)
4" (102 mm)	Face Brick	Uninsulated	3.8 (0.67)	.27 (1.53)	3.8 (0.67)	.27 (1.53)
		Cavity Insulated	8.8 (1.55)	.11 (0.62)	13.6 (2.39)	.07 (0.40)
4" (102 mm)	Common Brick	Uninsulated	4.1 (0.72)	.24 (1.36)	4.1 (0.72)	.24 (1.36)
		Cavity Insulated	9.2 (1.62)	.11 (0.62)	14.0 (2.46)	.07 (0.40)
6" (152 mm)	Lightweight Concrete Block	Uninsulated	5.0 (0.88)	.20 (1.14)	5.0 (0.88)	.20 (1.14)
		Cavity Insulated	10.0 (1.76)	.10 (0.57)	14.8 (2.60)	.07 (0.40)
		Cavity & Block Insulated	11.3 (1.99)	.09 (0.51)	16.1 (2.83)	.06 (0.34)
8" (203 mm)	Lightweight Concrete Block	Uninsulated	5.5 (0.97)	.18 (1.02)	5.5 (0.97)	.18 (1.02)
		Cavity Insulated	10.5 (1.85)	.10 (0.57)	15.3 (2.69)	.07 (0.40)
		Cavity & Block Insulated	13.4 (2.36)	.07 (0.40)	18.2 (3.20)	.06 (0.34)



**07210 Building Insulation**



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