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Wisconsin Department of Commerce

Safety & Buildings Division
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Evaluation #

New Product # 20089012
Replaces 200812-R
Previously Replaced 200252-R

Wisconsin
Building Products Evaluation

Material	EnerBlock Insulated Concrete Masonry Units
Manufacturer	West Materials, Inc. P.O. Box 97 Northfield, MN 55057

SCOPE OF EVALUATION

GENERAL: This report evaluates EnerBlock insulated concrete masonry units, manufactured by West Materials, Inc. The EnerBlock insulated concrete masonry units were evaluated for use as an insulation material with specified "R" values.

The **Comm** code requirements below in accordance with the current **Wisconsin Uniform Dwelling Code for 1 & 2 family dwellings:**

- **Thermal Performance Calculations:** The EnerBlock insulated concrete masonry units were evaluated in accordance with the thermal performance calculation requirements of **s. Comm 22.31**. The "R" values may be used in heat gain and heat loss calculations as required by **s. Comm 22.31 (4)** and **(5)**

The **IBC** requirements below in accordance with the current **Wisconsin Amended ICC Code:**

- **Thermal Performance:** The EnerBlock insulated concrete masonry units were evaluated in accordance with the thermal performance calculation requirements of **s. Comm 63.0102(2)(b)3.** and **4**.

DESCRIPTION AND USE

The EnerBlock insulated concrete masonry units consist of molded, rigid polystyrene insulation barriers that are inserted into specially designed one-cell concrete blocks. The insulation creates a nearly continuous thermal barrier in the cores and between the blocks, both vertically and horizontally.
The same insulating barriers are used for 8-, 10- and 12-inch block widths, in lightweight or heavyweight densities, and in any of the decorative faces offered. It fits both the block core and the cavity between adjoining blocks. Crush ribs on the sides and ears of the barrier assure necessary contact with masonry surfaces despite normal dimension

variations in the masonry units. Crush ribs on the top assure good vertical contact between barriers, while allowing for ladder or truss style joint reinforcing.

TESTS AND RESULTS

The tests and results listed below cover the **Wisconsin Uniform Dwelling Code (UDC), (for 1- and 2-family dwellings)** and the current **Wisconsin Amended 2000 IBC Code** requirements:

The following EnerBlock thermal insulation values (see TABLE 1), are based on the Isothermal Planes calculation method (series-parallel), as specified by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals.

Calculation and Certification Procedure: The R-Values in TABLE 1 are certified to comply with the series-parallel (iso-thermal planes) calculation procedure, recommended by NCMA and mandated by the American Society of Heating, Refrigeration, and Air Conditioning Engineers in ASHRAE Standard 90.1 for determining R-Values of concrete masonry. These R-Values were calculated based on the following:

1. Standard dimensions for units were provided by the client and verified to be within specified tolerance by the NCMA Laboratory by physical measurement of representative samples.
2. Concrete thermal conductivities are correlated to concrete density. The range of thermal values reflects variations in aggregate composition, concrete mix, and moisture content of the units, based on a compendium of historical data.
3. Units are face shell mortar bedded with 3/8-inch thick mortar joints. The effects of extruded mortar (i.e., mortar "fins") are neglected. Thermal resistivity of mortar is 0.103 hr • ft^2 • ˚F/Btu • in., per ASHRAE Fundamentals Handbook, 1997.
4. Insulation inserts are assumed to completely fill the cores of the units i.e., the effect of the minor, unintentional air gaps are neglected. Insulation thermal resistivity is 4.35 hr • ft^2 • ˚F/Btu • in., per Huntsman Corporation Technical Bulletin No 7.10. Insert dimensions verified from information and samples supplied by West Materials, Inc. Thermal resistivity of grout is 0.08 hr • ft^2 • ˚F/Btu • in based on 140-pcf grout and the mid-range concrete conductivity. Thermal conductance of partially grouted walls is determined by an area-weighted average of the conductances of the ungrouted wall and the fully grouted wall in accordance with ASHRAE 90.1.
5. R-Values include the effects of interior and exterior air film resistances of 0.68 and 0.17 hr • ft^2 • ˚F/Btu, respectively.
6. Series parallel calculations for concrete masonry are outlined in detail in Series-Parallel Procedure for Calculating the Overall Coefficient of Heat Transfer, NCMA.
7. Certification was performed in accordance with Evaluation Procedure of Thermal Performance for Integrally Insulated Concrete Masonry Walls, NCMA.

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Grouting Schemes: The R-Values for this system are affected by the location of grout in the concrete masonry wall. Six different grout placements are identified below. Insulation material may be present as applicable for this system in those areas in which grout is indicated. Those variations are described and depicted here for informational purposes:

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Disclaimer: Certification of the wall R-values was performed by the National Concrete Masonry Association in accordance with their "Evaluation Procedure of Thermal Performance for Integrally Insulated Concrete Masonry Walls". The thermal conductivity (K-value) of the expanded polystyrene is 0.23 Btu/hr/sq ft/^{o}F/in.

Thermal mass calculations, using methods acceptable to the department, may be submitted for review for specific projects.

This certification does not address structural performance, which shall be verified independently.

LIMITATIONS OF APPROVAL

The limitations below are in accordance with the current **Wisconsin Uniform Dwelling Code (UDC), (for 1 & 2 family dwellings)** and the current **Wisconsin Amended ICC Code:**

- The "R" values specified in this approval are calculated using the series-parallel or "isothermal planes" method in accordance with current ASHRAE standards and may be used in heat gain or loss calculations as required by **s. Comm 22.31(4)** and **(5)** of the **Wisconsin Uniform Dwelling Code** and **s. Comm 63.0102(2)(b)3.** and **4.** of the **Wisconsin Amended ICC Code**.

Structural approval is not included under this approval number.

The EnerBlock insulated concrete masonry units shall be installed in accordance with the manufacturer's installation instructions/manual.

This approval will be valid through December 31, 2013, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date:
Approval Date: July 25, 2008 By: _____

Lee E. Finley, Jr.
Product & Material Review
Integrated Services Bureau

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