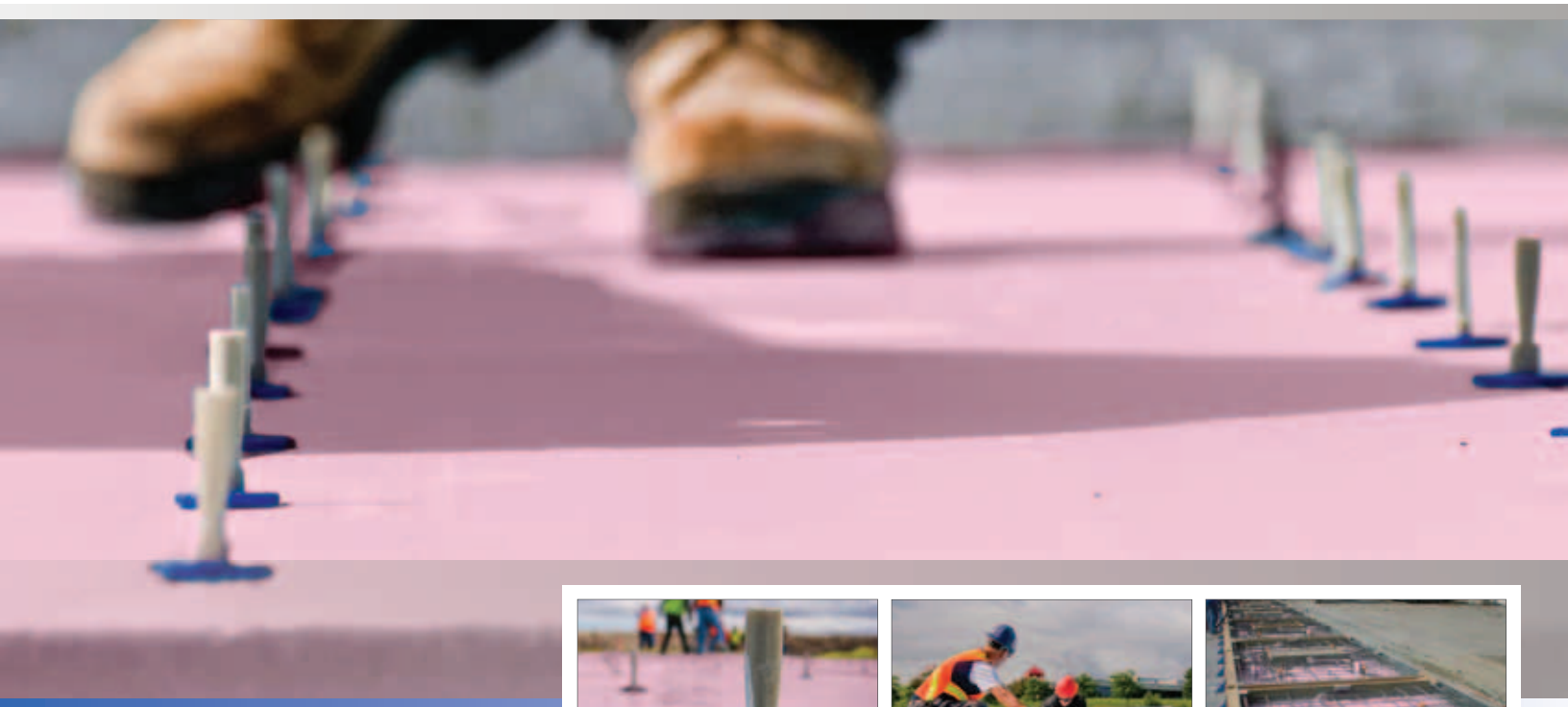

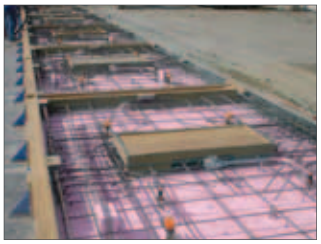

## Division 3

**Manufacturer:**

Thermomass

1000 Technology Drive

PO Box 950

Boone, IA 50036

US: 800-232-1748

Int'l: 515-433-6075

Fax: 515-433-6088

Web: www.thermomass.com

***Product Description:***

*Thermomass MC/MS series fiber-composite connectors are designed for the construction of non-composite, load-bearing and cladding concrete sandwich wall panels. The connectors are corrosion and alkali resistant and, when combined with rigid insulation, provide an integral insulation system for concrete walls and a connection between two wythes, or layers, of concrete to transfer loads to the structural wythe.*

***Composition & Materials:***

*Thermomass MC/MS Series connectors include a structural portion composed of E-CR glass fiber and cured vinyl ester resin, as well as thermoplastic molded sealing collars. The vinyl ester matrix impregnates the fiber strands, creating a composite material that has been tested and shown to be resistant to chemical attack. The sealing collars provide a friction fit when placed within the pre-drilled holes in the insulation. The flange (stop) ensures proper embedment depth.*

***Types & Sizes:***

*The MC series connectors provide for 2" (50 mm) of embedment in each wythe of concrete. They are designed specifically for sandwich walls that have a exterior wythe of 2 ½" (63 mm) or more. The MS series connectors provide for 1 ½" (38 mm) of embedment in both layers of concrete. They are designed specifically for sandwich walls that have a fascia wythe less than 2 ½" (63 mm). The overall connector lengths are determined based on the insulation thickness and minimum concrete wythe thickness. For example, if a non-composite sandwich wall has a configuration of 7 ¼" (184mm) of interior concrete, 3" (76mm) of insulation, and a 2 ½" (63mm) fascia wythe, the connector will be 6" (152 mm) in overall length. In this instance, the product designation would be MC 30/75. "MC" reflects the 2" (50 mm) of connector embedment. "30" reflects the insulation thickness times 10 in US customary units and "75" reflects the insulation thickness in metric units.*

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***Installation & Application:***

*The MC/MS series connectors are designed for use in both site-cast tilt-up and plant pre-cast applications. In either application, the connectors are installed through pre-drilled holes in rigid insulation into plastic concrete. The connectors should be pushed through the holes until the collar flange is seated against the insulation. For complete installation instructions, please contact Thermomass.*

***Technical Data:***

*Thermomass MC/MS series connectors are tested in accordance with ICC-ES AC320, Acceptance Criteria for Fiber-Reinforced Composite Connectors Anchored in Concrete and are listed with ICC-Evaluation Service, Inc (ICC-ES) Report ESR-1746. The connectors exhibit the properties and characteristics indicated in Table 1 when tested as represented.*

- *ASTM C581 Standard Practice for Determining Chemical resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service.*
- *ASTM D790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.*
- *ASTM D3039/D3039M Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials*
- *ASTM E488 Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements*
- *ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.*

*Additionally, the fire performance of a load bearing non-composite sandwich wall panel utilizing the MC/MS series connectors was conducted in accordance with ASTM E-119 at an independent testing laboratory, resulting in a four (4) hour fire rating.*

***Warranty:***

*Thermomass warrants that the connectors will not vary by more than 10% from performance specifications specified herein. All other warranties, expressed or implied, including the warranty of merchantability and fitness for a particular purpose, are excluded. No endorsement or promotion of any particular panel system or fabricator is intended. Thermomass makes no representation as to the performance of any panel fabricated using Thermomass MC/MS series fiber-composite connectors. The concrete wall panel fabricator is solely responsible for the performance of the building system panel. For further warranty information, contact a Thermomass representative.*

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Table 1: Physical Properties of Thermomass MC/MS Series Connectors

| Connector Series | | Single Connector - MC Series With fascia wythe ≥ 2.5" (63 mm) | Single Connector - MS Series With fascia wythe < 2.5" (63 mm) |
|---|---|---|---|
| Property & Test | Concrete Strength | | |
| Tensile strength of connector rod, ASTM D3039/D3039M | N/A | 126,000 psi (869 MPa) | 126,000 psi (869 MPa) |
| Flexural strength of connector rod, ASTM D790 | N/A | 120,000 psi (827 MPa) | 120,000 psi (827 MPa) |
| Ultimate tension (pull out) capacity, ASTM E488 | 6000 psi<br>4000 psi | 2828 lb (12,580 N)<br>2308 lb (10,266 N) | 2432 lb (10,818 N)<br>1358 lb (6040 N) |
| Ultimate shear capacity, ASTM E488 | 6000 psi<br>4000 psi | 608 lb (2704 N)<br>452 lb (2011 N) | 416 lb (1850 N)<br>402 lb (1788 N) |
| Tensile strength of connector rod, ASTM D3039/D3039M | N/A | 94.5% retained strength after 3,000 hours of immersion in pH12 solution. | 94.5% retained strength after 3,000 hours of immersion in pH12 solution. |