

MC/MS Series Connector

Energy-efficient, Non-composite Sandwich Panels

Overview

Thermomass MC/MS Series fiber-composite connectors are designed for the construction of non-composite, sandwich wall panels used in both load-bearing and cladding applications. Inserted through a layer of rigid foam board to create an integrally insulated wall assembly, the connectors eliminate thermal bridging while transferring loads from the fascia wythe, or layer, of concrete to the inner, structural wythe.

During construction, a layer of rigid insulation is set directly on a still-plastic layer of concrete. Thermomass connectors are inserted into the insulation layer. Finally, the second layer of concrete is cast. Once cured, the entire sandwich panel is lifting out of the form and erected into place.

MC/MS Series connectors are tested in accordance with ICC-ES AC308, and are listed with **ICC-Evaluation Service** (ICC-ES) Report ESR-1746. They are also certified building products under **Passive House** and **DIBt**.



Features

- **Energy-efficient:** Eliminates thermal bridging between the two concrete layers
- **Durable:** E-CR glass fiber and vinyl ester resin ingredients create an incredibly strong composite material, resistant to corrosion and chemical attack.
- **Extensively Tested:** MC/MS Series connectors have undergone thorough fire, cyclical and cracked concrete third-party testing.
- **Safe:** Load-bearing, non-composite sandwich panel samples using MC/MS Series connectors have been independently tested in accordance with ASTM E-119, resulting in a four-hour fire rating.
- **Easy-to-use:** Simple installation, especially with pre-drilled, pre-cut insulation. Thermoplastic molded sealing collars and flange provide precision installation embedment.



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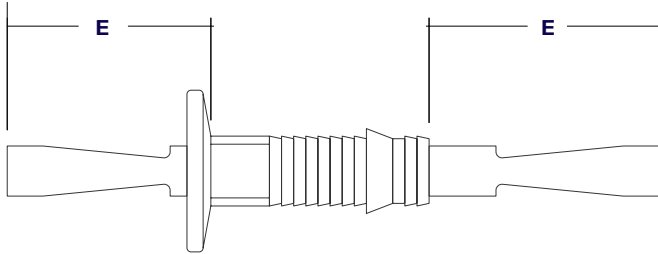
Physical Properties - MC/MS Series Connector

Description	MS Series	MC Series
Tension Capacity, Pt ¹ (f'c _{test} ² = 4,000 psi)	496 lbf	577 lbf
Average Shear Capacity, Vt ¹ (f'c _{test} ² = 4,000 psi)	103 lbf	119 lbf
Embedment Depth, h _v	1.5"	2"
Critical Minimum Concrete Edge Distance	5.25"	
Critical Minimum Connector Spacing	8"	
Cross-sectional Area	0.078" ²	
Average Moment of Inertia, I _A	0.005858" ⁴	
Bending Elastic Modulus, E _{Ab}	4,764,000 psi	
Connector Conductivity, λ	3.2 BTU•in/(ft ² •h•°F)	

¹Published capacities include a safety factor of 4:1

²Allowable capacities may be adjusted for concrete compressive strengths up to 6,000psi by using the following equation:

$$\text{Published Capacity} \times \sqrt{\frac{\text{actual concrete strength} \leq 6000\text{psi}}{\text{tested concrete strength}}} = \text{Adjusted connector capacity}$$



Connector Dimensions

Product Data - MS Series Connector

For wythe thickness of 2.5" (63mm) and less				
Item Number	Description	Insulation Thickness	Embedment (E)	Collar Color
4108010	MS 10/25	1" (25mm)	1.5" (38mm)	Purple
4108020	MS 15/40	1.5" (38mm)	1.5" (38mm)	Brown
4108030	MS 20/50	2" (51mm)	1.5" (38mm)	Dark Blue
4108045	MS 25/60	2.5" (63mm)	1.5" (38mm)	Dark Green
4108050	MS 30/75	3" (76mm)	1.5" (38mm)	Black
4108060	MS 35/90	3.5" (89mm)	1.5" (38mm)	Dark Gray
4108070	MS 40/100	4" (102mm)	1.5" (38mm)	Yellow
4108080	MS 45/115	4.5" (114mm)	1.5" (38mm)	Light Green
4108090	MS 50/130	5" (127mm)	1.5" (38mm)	White
4108100	MS 55/140	5.5" (140mm)	1.5" (38mm)	Orange

Selection Matrix - MC/MS Series Connector

Insulation Wythe Thickness (d _{ir} , inches)	Exterior Concrete Fascia Wythe Thickness (t, inches)						
		2.0	2.5	3.0	3.5	4.0	t>4.0
	2.0	MS	MS	MC	MC	MC	
	2.5	MS	MS	MC	MC	MC	
	3.0	MS	MS	MC	Contact Leviat Engineering for design assist within this range		
	3.5	MS	MS				
	t>3.5						

MC/MS recommendations for 16"x16" connector spacing

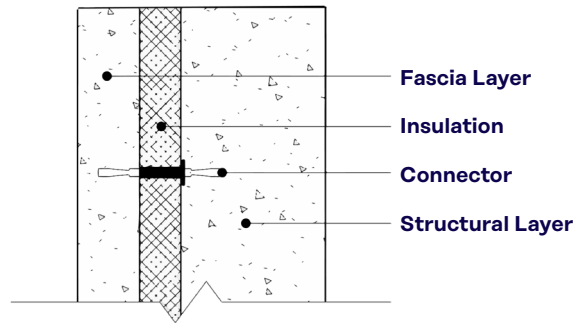
³For connector design methodology, reference ICC-ESR 1746.

⁴Recommendations are acceptable with service level wind pressures of up to 50 psf (ASD).

⁵Fascia-wythe features such as parapets and thickened zones are NOT considered.

⁶Minimum compressive strength (f'ci) of 2,500psi at time of lift. Minimum design compressive strength (f'c, 28-day) of 4,000psi.

⁷For MS connectors used in sandwich panel heights exceeding 40ft, or MC connectors used in sandwich panel heights exceeding 45ft, horizontal control joints may be required for exact fascia/insulation combinations (by others). [Assuming a temperature differential between interior operating temperature and outside environment, ΔT=40°F]



General Detail

Product Data - MC Series Connector

For wythe thickness of more than 2.5" (63mm)				
Item Number	Description	Insulation Thickness	Embedment (E)	Collar Color
4100010	MC 10/25	1" (25mm)	2" (51mm)	Purple
4100020	MC 15/40	1.5" (38mm)	2" (51mm)	Brown
4100030	MC 20/50	2" (51mm)	2" (51mm)	Dark Blue
4100040	MC 25/60	2.5" (63mm)	2" (51mm)	Dark Green
4100050	MC 30/75	3" (76mm)	2" (51mm)	Black
4100060	MC 35/90	3.5" (89mm)	2" (51mm)	Dark Gray
4100070	MC 40/100	4" (102mm)	2" (51mm)	Yellow
4100010	MC 45/115	4.5" (114mm)	2" (51mm)	Light Green
4100090	MC 50/130	5" (127mm)	2" (51mm)	White
4100100	MC 55/140	5.5" (140mm)	2" (51mm)	Orange
4100110	MC 60/150	6" (152mm)	2" (51mm)	Red