

MS-T Series Connector

Energy-efficient, Non-composite Sandwich Panels

Overview

MS-T Series connectors are designed with a patented threaded overmold to be installed (drilled) through the insulation and into the fascia concrete layer without the use of pre-punched insulation sheets. Like the standard MS Series, it is a non-conductive, non-corrosive, fiber-composite connector designed for the construction of non-composite concrete sandwich wall panels. The connectors eliminate thermal bridging while transferring loads from the fascia wythe, or layer, of concrete to the inner, structural wythe.

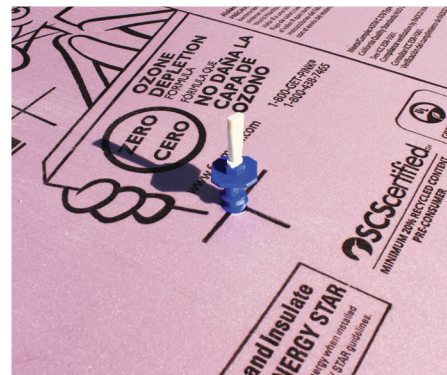
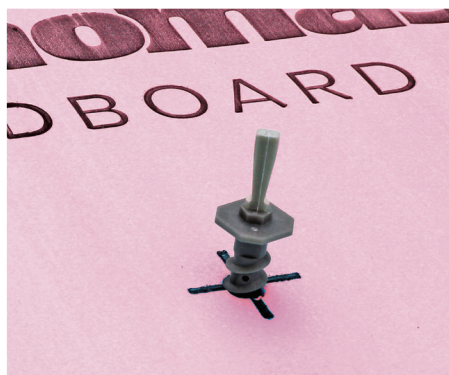
MS-T connectors are designed site-cast tilt-up and plant precast construction, and can be installed with any 6 or 12 point, 12 mm deep well socket, 2 1/2" (63 mm) depth or greater.

During casting, rigid insulation is set directly on the new layer of concrete. MS-T Series connectors are drilled through the insulation layer, and a second layer of concrete is cast. Once cured, the entire panel is lifted out of the form and erected.



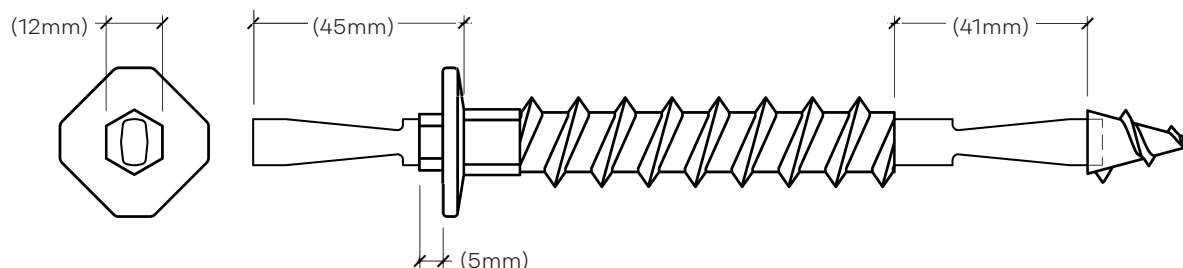
Features

- **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.
- **Safe:** Load-bearing, non-composite sandwich panel samples using MS-T Series connectors have been independently tested in accordance with ASTM E-119, resulting in a four-hour fire rating.
- **Extensively Tested:** MS-T Series connectors have undergone thorough fire, cyclical and cracked concrete third-party testing. They have also been tested in accordance with ICC-ES AC308, and are listed with **ICC-Evaluation Service** (ICC-ES) Report ESR-1746, and are certified building products under **Passive House** and **DIBt**.
- **Easy Installation:** The MS-T connector has two distinct ends: one with a typical dovetail and the other with a threaded tip. The molded collar is threaded and includes a hexagon socket mount for easy installation.



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Product Data - MS-T Series Connector

For wythe thickness of 3" (76mm) and greater			
Item Number	Description	Insulation Thickness	Collar Color
4102015	MS-T 20/50-DG	2" (51mm)	Dark Gray
4102026	MS-T 25/60-DG	2.5" (63mm)	Dark Gray
4102035	MS-T 30/75-DG	3" (76mm)	Dark Gray
4102040	MS-T 35/90-DG	3.5" (89mm)	Dark Gray
4102052	MS-T 40/100-DG	4" (102mm)	Dark Gray
4102060	MS-T 45/115-DG	4.5" (114mm)	Dark Gray
4102070	MS-T 50/130-DG	5" (127mm)	Dark Gray
4102080	MS-T 55/140-DG	5.5" (140mm)	Dark Gray
4102090	MS-T 60/150-DG	6" (152mm)	Dark Gray

Physical Properties - MS-T Series Connector

Description	MS-T Series
Tension Capacity, P_t^1 ($f'_{c_{test}} = 4,000$ psi)	496 lbf
Average Shear Capacity, V_t^1 ($f'_{c_{test}} = 4,000$ psi)	103 lbf
Embedment Depth, h_v	1.5"
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:

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

Selection Matrix - MS-T Series Connector

Insulation Wythe Thickness (d _i , inches)	Exterior Concrete Fascia Wythe Thickness (t, inches)					
		2.0	2.5	3.0	3.5	t>3.5
	2.0	MS-T	MS-T	MS-T	MS-T	Contact Leviat Engineering for design assist within this range
	2.5	MS-T	MS-T	MS-T	MS-T	
	3.0	MS-T	MS-T	MS-T	MS-T	
	3.5	MS-T	MS-T			
	t>3.5					

MS-T 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 ($f'_{c, 28\text{-day}}$) of 4,000psi.

⁷For MS-T connectors used in sandwich panel heights exceeding 30ft, horizontal control joints may be required for exact fascia/insulation combinations (by others). [Assuming a temperature differential between interior operating temperature and outside environment, $\Delta T = 40^\circ\text{F}$]