



FERO THERMAL MASONRY TIES & CONNECTORS



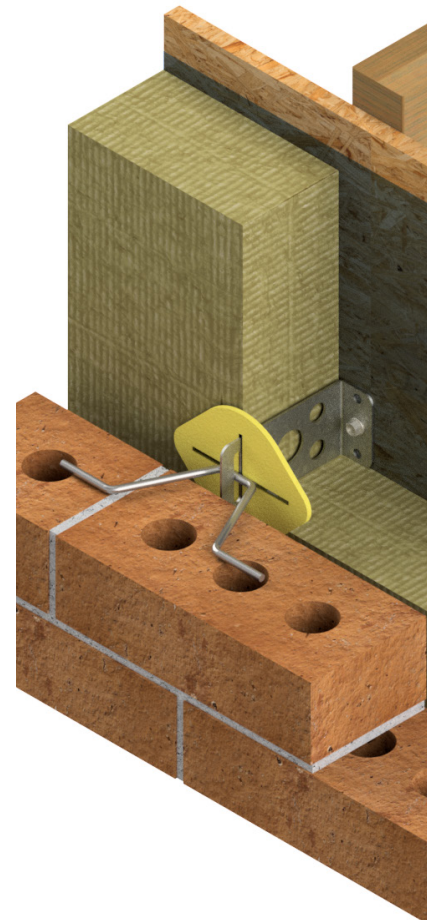
Challenge

To design energy efficient masonry, stone and granite veneer building enclosures with high-performing thermal ties and connectors that accommodate increasing wall cavity sizes and expanding energy guidelines and codes.¹

Solution

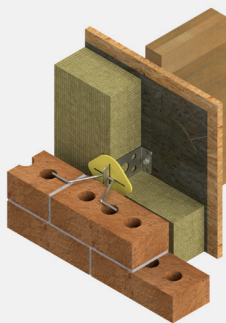
FERO THERMAL TIES AND CONNECTORS ARE YOUR SOLUTION

- 1 PERFORMANCE.** Backed by independent thermal data, FERO offers the best performing thermal ties and connectors on the market.²
- 2 PROVEN THERMAL AND COST EFFICIENCIES.**² The FERO Thermal Tie is engineered to introduce structural breaks in the material that provide a barrier to thermal transfer while maintaining structural performance. This thermally-broken tie offers superior thermal performance without the use of composite materials, thereby reducing costs and delivering fire resistance, strength, performance at low temperatures and durability (service life).
- 3 ACCOMODATES ALL CAVITY WIDTHS.** FERO engineers will provide a Thermal Tie solution for any wall cavity design.
- 4 FEWER PENETRATIONS AND REDUCED MATERIAL COST.** FERO Thermal Ties can be spaced at greater intervals, typically 800 mm (32") horizontal by 600 mm (24") vertical. The strength and pullout capacity of FERO Thermal Ties means lower material costs.
- 5 FASTENS INSULATION.** No need for insulation fasteners, FERO Thermal Ties do it for you. The optional FERO Insulation Support is placed on the FERO Thermal Tie and permanently restrains the insulation, ensuring close contact between the insulation and the air barrier. No supplementary insulation fasteners and penetrations are needed, further reducing the effects of thermal bridging.
- 6 UNPARALLELED WALL ASSEMBLY PERFORMANCE BY INTEGRATING FERO FAST™ THERMAL BRACKETS.** Design a comprehensive, thermally efficient wall assembly by using our FAST™ Thermal Brackets, a thermally-broken, shelf angle support system.

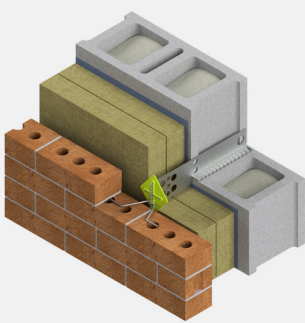


FERO has a Thermal Tie or Connector for Every Wall Assembly

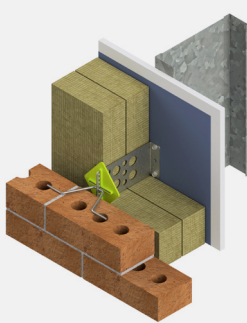
FERO Thermal Ties and Connectors are completely customizable for any size wall cavity. We have designed and engineered products for all types of back-up walls, veneers and construction tolerances. For more information, visit FEROCORP.COM.



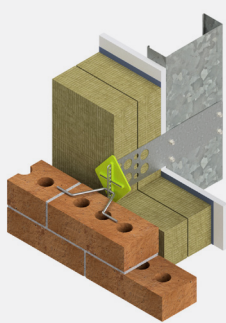
FERO Thermal Rap-Tie™



FERO Thermal Block Shear Connector™



FERO Thermal Heavy Duty Rap-Tie™



FERO Thermal Stud Shear Connector™

COMPARE: Why Choose FERO Thermal Ties?

The comparison table below demonstrates how FERO's Thermal Ties outperform on every level.

	TIES WITH COMPOSITE COMPONENTS - STAINLESS STEEL	TYPICAL GALVANIZED STEEL MASONRY TIE	FERO THERMAL RAP-TIE™ - STAINLESS STEEL
Masonry Tie Thermal Performance Comparison ²			
Energy Efficiency ³ (lower is better)	~7% reduction in effective R-Value	~ 24% reduction in effective R-Value	~4% reduction in effective R-Value
Effective R-Value ft² h °F/Btu (m² K/W) (higher is better)	R-19.6 (3.44)	R-16.1 (2.83)	R-20.2 (3.60)
Assembly Thermal Transmittance Btu/h ft² °F (W/m² °K) (lower is better)	0.051 (0.29)	0.062 (0.35)	0.050 (0.278)
Type of Thermal Break	Plastic/Composite	None	Structural Thermal Break
Cost	Increased labour and material construction costs as more ties required	Less performance for similar costs of FERO Thermal Tie	Decreased materials and construction costs with fewer ties due to increased spacing
Factored Tie Resistance kN (lb-f) ⁴	1.11 (250)	0.79 (178)	1.51 (331)

*See page 4 for all footnotes.

FERO FAST™ THERMAL BRACKETS

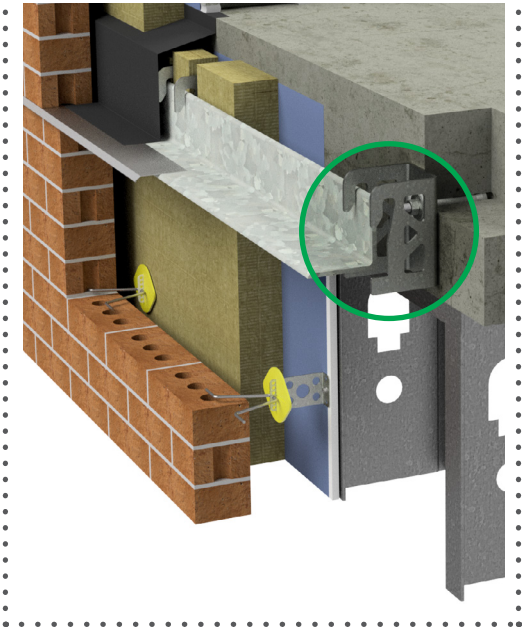
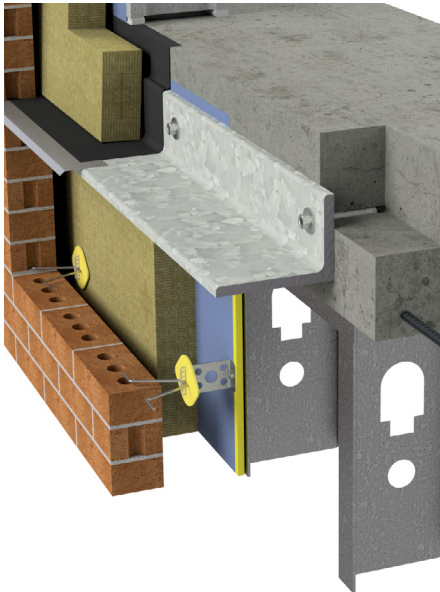
FERO Thermal Ties, Connectors and FAST Thermal Brackets can be used together to create a comprehensive, cost effective, and thermally-efficient masonry wall system.

FAST Thermal Brackets are a smart, cost-effective, thermally-broken shelf angle solution. FAST Thermal Brackets reduce thermal bridging caused by conventional shelf angles by 84%.

COMPARE:

FERO's FAST Thermal Bracket proprietary design outperforms conventional design on every level. The below comparison shows a typical conventional shelf angle design compared to a FERO FAST™ Thermal Bracket.

		DIRECT ANCHORED SHELF ANGLE	FERO FAST THERMAL BRACKET™
Degradation of Insulation Performance Caused by Shelf Angle Design²		48%	13%
Thermal Bridging³	Linear Thermal Transmittance Ψ Btu/ft hr °F (W/m K)	0.337 (0.583)	0.055 (0.095)
Thermal Performance on Clear Wall Assemblies³	Exterior Assembly R-Value (no shelf angle)	19.6	19.6
	Effective R-Value ft² h °F/Btu (m² K/W)	R-10.8 (1.90)	R-16.7 (2.94)
	Assembly U_o Thermal Transmittance Btu/h ft² °F (W/m² °K)	0.093 (0.525)	0.060 (0.341)
Type of Thermal Break		None	Structural Thermal Break
Cost		Increased materials and costs with thicker and heavier shelf angles that are difficult to install	FAST Thermal Brackets span the wall cavity allowing use of smaller and lighter shelf angles, reducing materials by 2 – 4 x



*See page 4 for all footnotes.



Expert Support

FERO's highly skilled team of engineers and technical advisors provide full design and engineering support as well as customized solutions for individual project needs. We are here to discuss all design, engineering or technical inquiries.

Technical Support: engineering@ferocorp.com



Contact Us

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For our building science engineer thermal modelling reports, submittal sheets, engineering/design data, CAD/Revit files, Green Building, Passive House, LEED information and installation instructions.

¹ Including the NYC 2020 Energy Conservation Code referencing thermal transmittance PSI-Values from the BC Hydro Building Envelope Thermal Bridging Guide. 2020 Energy Conservation Construction Code of New York State (2020 ECCCNY), based on the 2018 edition of the International Energy Conservation Code and ASHRAE 90.1-2016, became effective on May 12th, 2020.

² Evaluated by independent building science engineer thermal evaluation and data (Morrison & Hershfield Building Science Engineer Thermal Evaluation – 2020, and RDH Building Science Engineer Thermal Evaluation – 2020, and the BC Hydro Building Envelope Thermal Bridging Guide).

³ Evaluated by independent science engineer thermal data (Morrison & Hershfield Building Science Engineer Thermal Evaluation – 2020 (see table 3.1 and 3.2) and the BC Hydro Building Envelope Thermal Bridging Guide).

⁴ The factored resistance of the FERO tie system, $\phi P(uH)$, is calculated using the Limit States Design procedures of CSA A370-14.



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The FERO family of Masonry Wall Connectors, as installed, may fall within the scope of one or more issued patents or pending patent applications, according to the applicable installation type. Those patents include US 8,051,621; US 8,555,595; US 8,893,452 and corresponding Canadian Patents CA 2 566 552; CA 2 700 636; and CA 2 804 542. The FERO FAST family of masonry supports, as installed may fall within the scope of one or more US or foreign patents or patent applications. Those patents include US 9,316,004; US 9,447,585; US 10, 323,419; US 10,294,676; US 11,041,315; US 11,162,265 and other pending applications. Other US and Foreign Patents Pending.