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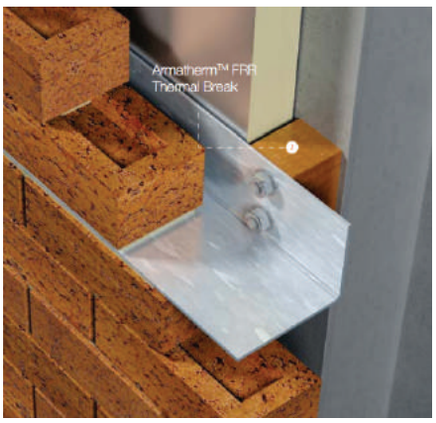
Masonry Shelf Angle Thermal Break

Armatherm™ Grade FRR

Structural Thermal Break Solutions

Introduction



Masonry veneer walls require tiebacks and shelf angles which form significant thermal bridges and can reduce a wall's R value by as much as 50% making it difficult to meet energy codes. Shelf angles transfer the masonry load back to the building's structural steel or concrete slab edge interrupting the continuous insulating layer of the wall assembly creating a continuous thermal bridge.

To improve the U value of a masonry wall assembly, the shelf angle can be connected to the structure at discreet, evenly spaced points such as plate "blades" allowing the insulation to pass behind the steel angle, reducing the effects of a continuous thermal bridge. However, building the shelf angle outwards requires larger geometries and additional material to support the cantilevered load.

Alternatively, Armatherm™ FRR material can be used directly behind the shelf angle as a thermal break within the insulating layer significantly reducing the linear transmittance of the shelf angle. Rigid, metal flashing used as a waterproofing can then be replaced with a non-conductive, self-adhered membrane.

Scenario	Exterior + Cavity Insulation 1D R-Value $ft^2hr°F/BTU$ (W/m^2 K)	Clear Wall R-Value (R_o) $ft^2hr°F/BTU$ (m^2 K/W)	U_o BTU/$ft^2hr°F$ (W/m^2 K)	R *effective* with shelf angle $ft^2hr°F/BTU$ (m^2 K/W)	U *effective* BTU/$ft^2hr°F$ (W/m^2 K)	Linear Transmittance of Shelf Angle BTU/hrft°F (W/mK)	% Reduction in Heat Loss
Continuous Steel Shelf Angle	R-15 + R-12 (2.64) + (2.11)	R-19.8 (3.48)	0.051 (0.29)	R-9.9 (1.74)	0.101 (0.58)	0.314 (0.544)	-
Steel Shelf Angle with 25mm Armatherm FRR with washer, bushing and S.A.M.	R-15 + R-12 (2.64) + (2.11)	R-19.8 (3.48)	0.051 (0.29)	R-13.8 (2.43)	0.072 (0.41)	0.135 (0.234)	57%

Armatherm ™ Thermal bridging solutions to improve building envelope performance

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