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Steel Canopy/Balcony

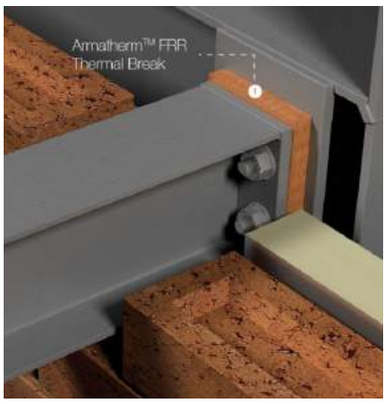
Armatherm™ Grade FRR

Structural Thermal Break Solutions

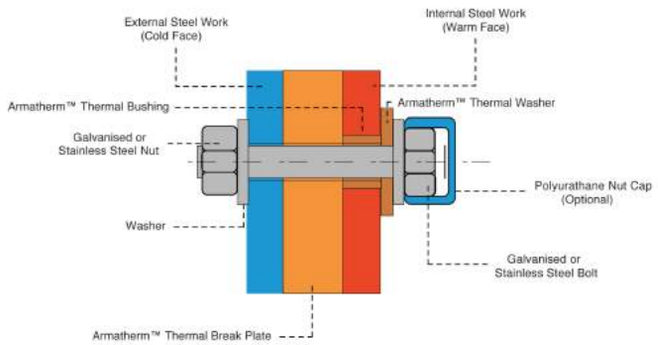
Introduction

The most common interface details for structural framing are canopies and balconies that use cantilevered steel or aluminium elements. These elements are typically connected to slab edges or spandrel beams on the interior side of the thermal envelope passing through insulation and air barrier layers. The R value of a wall assembly can be reduced by as much as 60%.

Using a thermal break at these connections will improve the U value of a wall assembly which includes this type of point transmittance. Armatherm™ FRR structural thermal break material is capable of transferring the loading in moment and shear connections without creating significant rotation. In fact, in structural testing, Armatherm™ FRR has been evaluated in moment and shear connections for creep, rotation and any impact on bolt force. While minimising heat flow, the structural performance of these connections must remain acceptable.



Scenario	Exterior Insulation 1D R-Value ft²hr°F/BTU (m² K/W)	Clear Wall R-Value (R_{cw}) ft²hr°F/BTU (m² K/W)	U_c BTU/ft²hr°F (W/m² K)	R *effective* with Slab and Beam ft²hr°F/BTU (m² K/W)	U *effective* with Slab and Beam BTU/ft²hr°F (W/m² K)	Point Transmittance of Beam BTU/hr°F (W/K)	% Reduction in Heat Loss
Continuous Beam	R-15 (2.64)	R-18.5 (3.25)	0.054 (0.31)	R-6.9 (1.21)	0.145 (0.83)	1.73 (0.92)	-
25mm Armatherm FRR using steel bolts	R-15 (2.64)	R-18.5 (3.25)	0.054 (0.31)	R-7.3 (1.28)	0.138 (0.78)	1.56 (0.83)	10%
25mm Armatherm FRR using stainless steel bolts	R-15 (2.64)	R-18.5 (3.25)	0.054 (0.31)	R-8.4 (1.48)	0.119 (0.68)	1.16 (0.62)	33%
25mm Armatherm FRR using stainless steel bolts and FRR washers and bushings	R-15 (2.64)	R-18.5 (3.25)	0.054 (0.31)	R-9.2 (1.61)	0.109 (0.62)	0.95 (0.50)	45%
50mm Armatherm FRR using stainless steel bolts and FRR washers and bushings	R-15 (2.64)	R-18.5 (3.25)	0.054 (0.31)	R-10.2 (1.79)	0.098 (0.56)	0.72 (0.38)	58%



Armatherm ™ Thermal bridging solutions to improve building envelope performance

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