



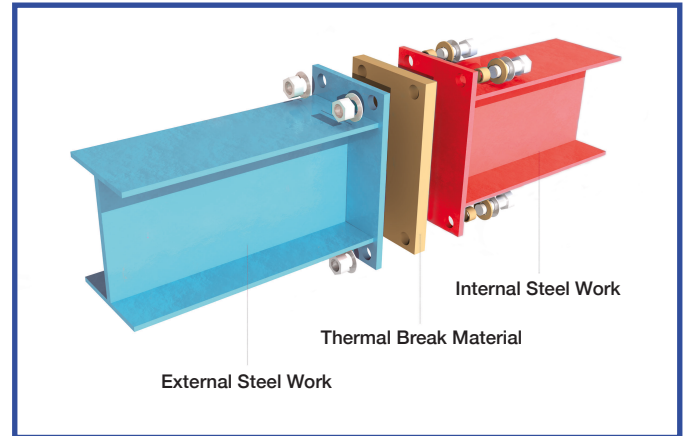
www.armatherm.co.uk

# Armatherm™ Grade FRR

## Structural Thermal Break Material

### Introduction

Reducing heat flow within a building's thermal envelope reduces energy consumption as well as potential condensation issues. Thermal bridging through steel and concrete framing can have a significant impact on a building's energy performance. Armatherm™ FRR thermal break material provides low thermal conductivity and high compressive strength. Armatherm™ FRR is made of a reinforced, thermoset resin which has a fire rating of Euroclass B standard (when using material 20mm or thicker) and has very limited creep under load making it the ideal material for use in structural thermal break connections.



### Specifications of Armatherm™ FRR

Maximum Loading Pressure	301.5 N/mm <sup>2</sup>
Compressive Modulus	5758 N/mm <sup>2</sup>
Shear Strength	110 N/mm <sup>2</sup>
Standard Thickness	12mm, 20mm, 25mm, 50mm
Thermal Conductivity	W/m°K 0.35 <sup>1</sup>
Minimum Operating Temp	°C -51
Maximum Operating Temp	°C 90

<sup>1</sup>For comparison, the thermal conductivity of Mild Steel is 56 W/m.K

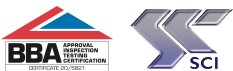
**Other thicknesses available: 3mm, 6mm, 10mm, 15mm.**

Armatherm™ FRR sheets can be bonded together to satisfy U value and thickness specification requirements.



### Applications of Armatherm™ FRR

- Beam Connections
- Masonry Shelf Angles
- Lintels
- Canopies
- Column Base
- Balconies
- Curtain Wall Mullions
- Rain Screens
- Roof Penetrations



Call **+44 (0) 1274 591115** For all enquiries

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### Washer and Bushing

A thermal break should also be provided at the front side of the bolt head between the steel washer and face of the exterior steel. This prevents a thermal bridge through the bolt which would otherwise provide a path for heat flow through the thermal break assembly. Armatherm™ washers and bushings are recommended to eliminate this path and any potential for condensation within the building envelope. Contact us for assistance with your structural design or thermal calculations.



### Bushing Detail

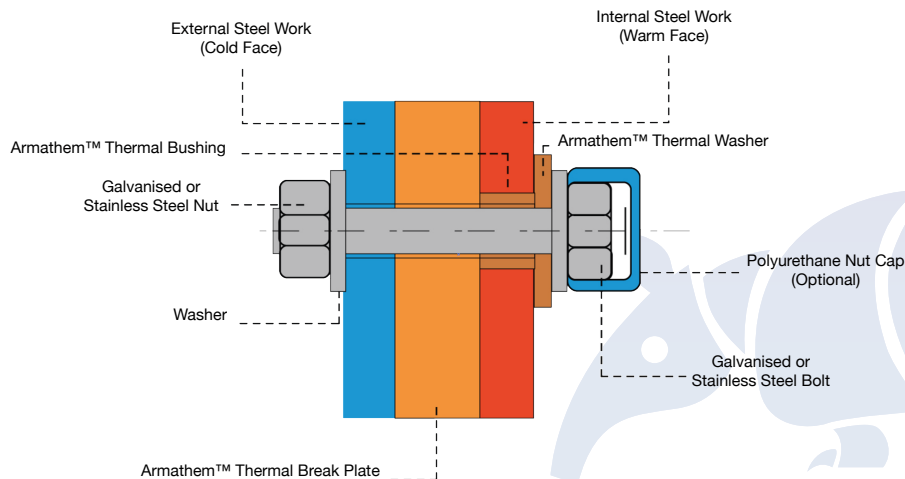
Bolt Size	Hole In Pad	Bushing ID	Bushing OD	Hole in Structure	Bushing Length (Standard)
3/8"	0.44"	0.44"	0.57"	0.64"	0.375"
M12	14mm	14mm	20mm	22mm	10mm
1/2"	0.55"	0.55"	0.78"	0.85"	0.375"
M16	18mm	18mm	24mm	26mm	13mm
5/8"	0.70"	0.70"	1.0"	1.07"	0.50"
M20	22mm	22mm	28	30	13mm
3/4"	0.86"	0.86"	1.10"	1.17"	0.50"
M24	26mm	26mm	32mm	32mm	17mm
1"	1.05mm	1.05mm	1.25"	1.38"	0.625"
M28	30mm	30mm	36mm	39mm	20mm

Armatherm™ can manufacture custom Bushing Lengths, please get in touch for more information.

### Washer Detail

Bolt Size	Washer ID	Washer OD	Thickness
3/8"	0.44"	1.18"	0.25"
M12	14mm	30mm	6mm
1/2"	0.55"	1.18"	0.25"
M16	18mm	40mm	6mm
5/8"	0.70"	1.57"	0.25"
M20	22mm	47mm	6mm
3/4"	0.86"	1.85"	0.25"
7/8"	0.94"	2"	0.25"
M24	26mm	50mm	6mm
1"	1.05"	2.00"	0.25"
M28	30mm	65mm	6mm

Armatherm™ can also manufacture custom washers. All that is required is the specified ID, OD and thickness.



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