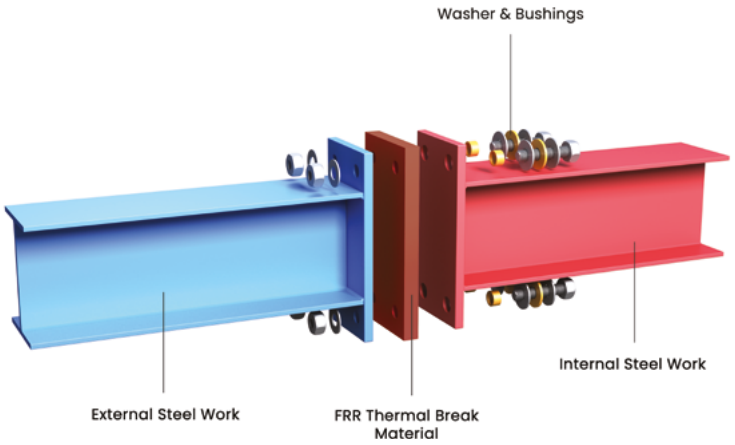
ARMATHERM™ GRADE FRR

Structural Thermal Break Material

INTRODUCTION

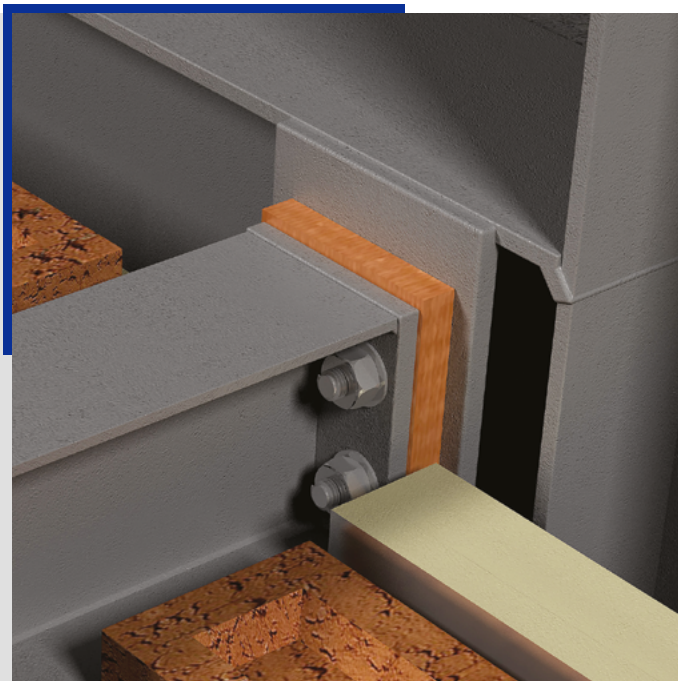
Reducing heat flow within a building's thermal envelope reduces energy consumption as well as potential condensation issues. Thermal bridging through steel and concrete framing can have a significant impact on a building's energy performance. Armatherm™ FRR thermal break material provides low thermal conductivity and high compressive strength, 20mm or thicker is Euro Class B fire rating. Armatherm™ FRR is made of a reinforced, thermoset resin which enables FRR to boast limited combustibility and reduce the amount of 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/mm²**
Compressive Modulus	**5758 N/mm²**
Shear Strength	**110 N/mm²**
Standard Thickness	**12mm, 20mm, 25mm, 50mm**
Thermal Conductivity	**0.35 W/mK**
Minimum Operating Temp	**-51°C**
Maximum Operating Temp	**90°C**

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

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

Armatherm™ FRR

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ISOLATION WASHERS AND BUSHINGS

A thermal break should also be provided at the front side of the bolt head between two steel washers 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™ Isolation 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

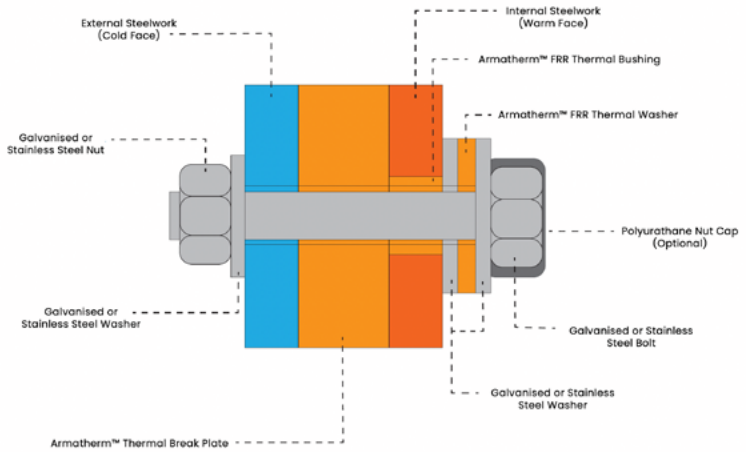
Bolt Size	Hole In Pad	Bushing ID	Bushing OD	Hole in Structure	Bushing Length (Standard)
3/8"	0.44"	0.44"	0.57"	0.64"	0.50"
M12	**14mm**	**14mm**	**20mm**	**22mm**	**13mm**
1/2"	0.55"	0.55"	0.78"	0.85"	0.50"
M16	**18mm**	**18mm**	**24mm**	**26mm**	**13mm**
5/8"	0.70"	0.70"	1.00"	1.07"	0.50"
M20	**22mm**	**22mm**	**28mm**	**30mm**	**13mm**
3/4"	0.86"	0.86"	1.10"	1.17"	0.50"
M23	**24mm**	**24mm**	**32mm**	**35mm**	**13mm**
7/8"	0.94"	0.94"	1.25"	1.31"	0.50"
M24	**26mm**	**26mm**	**32mm**	**35mm**	**13mm**
1"	1.05"	1.05"	1.25"	1.38"	0.50"

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"
M23	**24mm**	**50mm**	**6mm**
7/8"	0.94"	2.00"	0.25"
M24	**26mm**	**50mm**	**6mm**
1"	1.05"	2.00"	0.25"

Armatherm has a tolerance of +/- 0.76mm on the I.D. and + 1.52mm on the O.D. on our thermally broken bushings.

CUSTOM ISOLATION BUSHINGS AND WASHERS AVAILABLE UPON REQUEST.



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