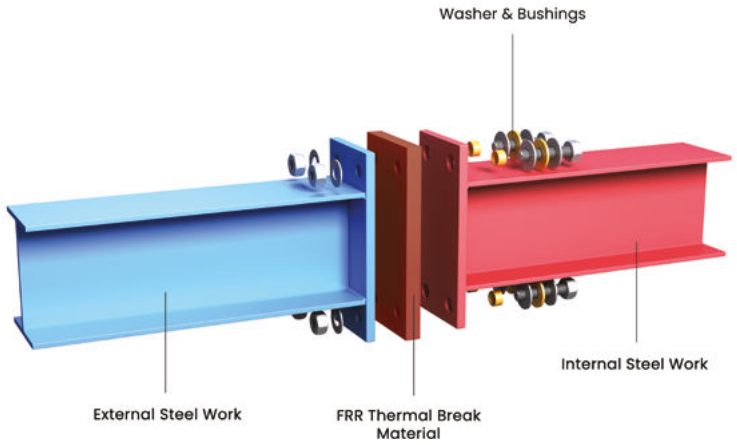
# ARMATHERM™ GRADE FRR

Structural Thermal Break Material

## INTRODUCTION

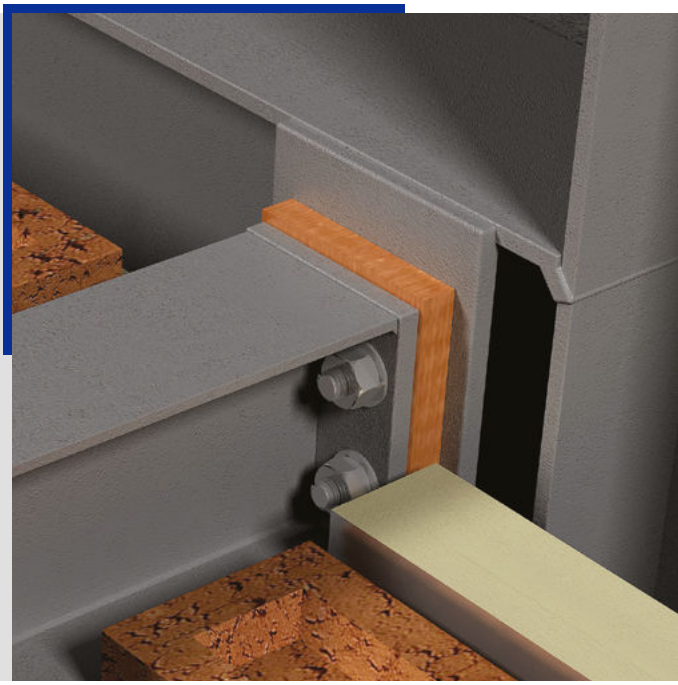
Reducing heat flow within a building's thermal envelope reduces energy consumption as well as potential condensation issues. Thermal bridging through steel and concrete framing can have a significant impact on a building's energy performance. Armatherm™ FRR thermal break material provides low thermal 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

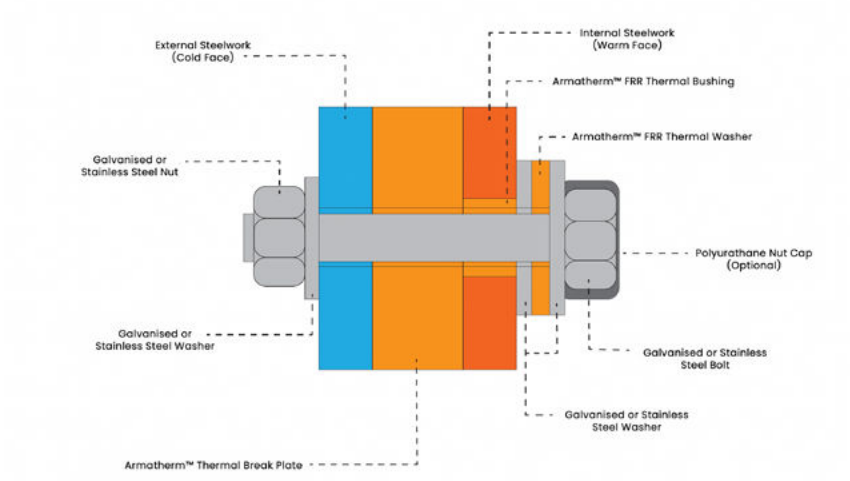
| Bolt Size | Hole In Pad | Bushing ID | Bushing OD | Hole in Structure | Bushing Length (Standard) |
|---|---|---|---|---|---|
| 3/8" | 0.44" | 0.44" | 0.57" | 0.64" | 0.50" |
| **M12** | **14mm** | **14mm** | **20mm** | **22mm** | **13mm** |
| 1/2" | 0.55" | 0.55" | 0.78" | 0.85" | 0.50" |
| **M16** | **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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