

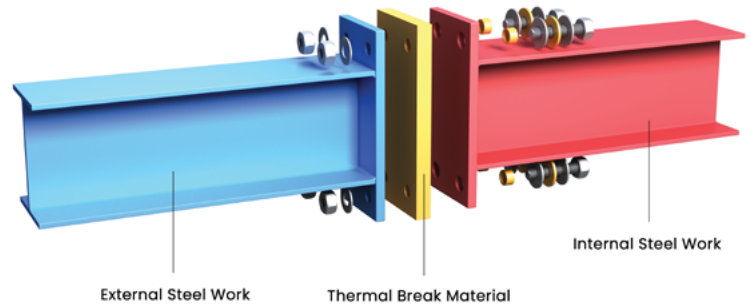
# ARMATHERM™ GRADE FRR

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 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.

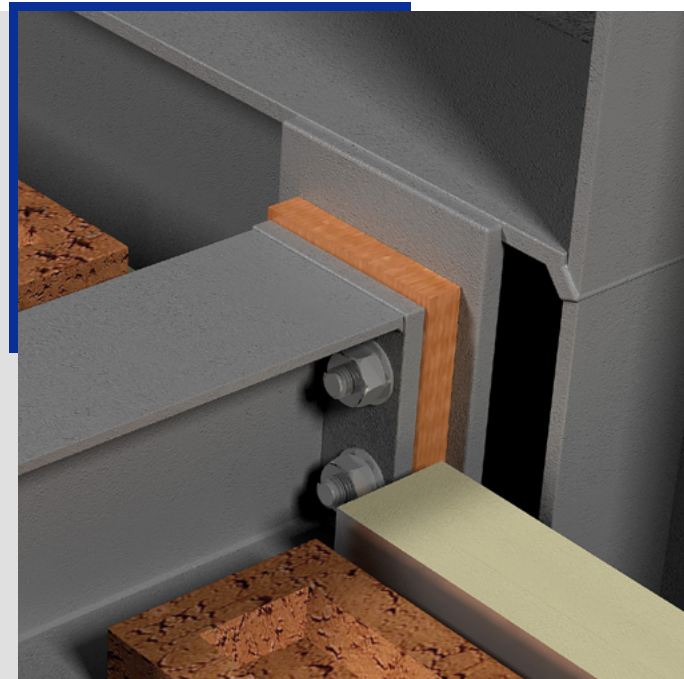


## SPECIFICATIONS OF ARMATHERM™ FRR

|                          |   |
|--------------------------|---|
| Maximum Loading Pressure | <b>43,000 psi</b>                       |
| Compressive Modulus      | <b>835,000 psi</b>                      |
| Shear Strength           | <b>16,000 psi</b>                       |
| Standard Thickness       | <b>1/2", 3/4", 1", &amp; 2"</b>         |
| Thermal Conductivity     | <b>1.056 BTU-in/h-ft<sup>2</sup>-°F</b> |
| Minimum Operating Temp   | <b>-60°F</b>                            |
| Maximum Operating Temp   | <b>220°F</b>                            |

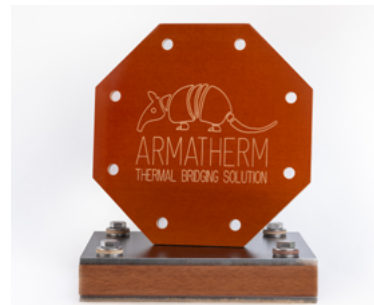
**Other thicknesses available: 1/16", 1/8", 1/4", 3/8", 5/8", 7/8".**

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 Series



# ARMATHERM™ GRADE FRR

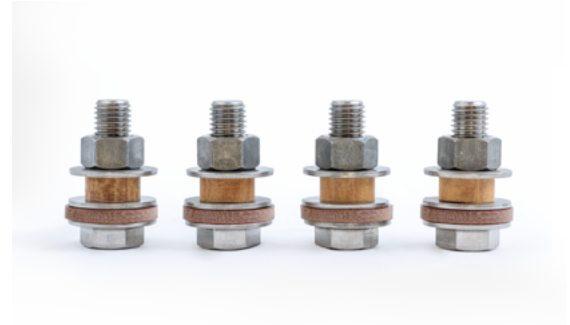
Structural Thermal Break Material



## 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"                     |
| <b>M12</b> | <b>14mm</b> | <b>14mm</b> | <b>20mm</b> | <b>22mm</b>       | <b>13mm</b>               |
| 1/2"       | 0.55"       | 0.55"       | 0.78"       | 0.85"             | 0.50"                     |
| <b>M16</b> | <b>18mm</b> | <b>18mm</b> | <b>24mm</b> | <b>26mm</b>       | <b>13mm</b>               |
| 5/8"       | 0.70"       | 0.70"       | 1.00"       | 1.07"             | 0.50"                     |
| <b>M20</b> | <b>22mm</b> | <b>22mm</b> | <b>28mm</b> | <b>30mm</b>       | <b>13mm</b>               |
| 3/4"       | 0.86"       | 0.86"       | 1.10"       | 1.17"             | 0.50"                     |
| <b>M23</b> | <b>24mm</b> | <b>24mm</b> | <b>32mm</b> | <b>35mm</b>       | <b>13mm</b>               |
| 7/8"       | 0.94"       | 0.94"       | 1.25"       | 1.31"             | 0.50"                     |
| <b>M24</b> | <b>26mm</b> | <b>26mm</b> | <b>32mm</b> | <b>35mm</b>       | <b>13mm</b>               |
| 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"      |
| <b>M12</b> | <b>14mm</b> | <b>30mm</b> | <b>6mm</b> |
| 1/2"       | 0.55"       | 1.18"       | 0.25"      |
| <b>M16</b> | <b>18mm</b> | <b>40mm</b> | <b>6mm</b> |
| 5/8"       | 0.70"       | 1.57"       | 0.25"      |
| <b>M20</b> | <b>22mm</b> | <b>47mm</b> | <b>6mm</b> |
| 3/4"       | 0.86"       | 1.85"       | 0.25"      |
| <b>M23</b> | <b>24mm</b> | <b>50mm</b> | <b>6mm</b> |
| 7/8"       | 0.94"       | 2.00"       | 0.25"      |
| <b>M24</b> | <b>26mm</b> | <b>50mm</b> | <b>6mm</b> |
| 1"         | 1.05"       | 2.00"       | 0.25"      |

Armatherm has a tolerance of +/- 0.03" on the I.D. and + 0.06" on the O.D. on our thermally broken bushings.

### CUSTOMER ISOLATION BUSHINGS AND WASHERS ALSO AVAILABLE UPON REQUEST.

