

SECTION 05 12 40

STRUCTURAL THERMAL BREAK MATERIAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section including the following.
1. Structural thermal breaks fabricated from the following material:
    - a. Reinforced thermoset resin.
  2. Thermal breaks at the following locations:
    - a. Canopies.
    - b. Roof penetrations.
    - c. Exterior Platforms.
    - d. Curtain wall mullions.
    - e. Cladding/façade connections.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
1. Section 03 30 00 - CAST-IN-PLACE CONCRETE for coordination with concrete.
  2. Section 05 51 36 METAL GRATE PLATFORM.
  3. Section 05 12 00 - STRUCTURAL STEEL FRAMING for coordination with framing.
  4. Section 05 50 00 MISCELLANEOUS METAL FABRICATIONS for coordination with general steel requirements.
  5. Section 05 51 36 METAL GRATE PLATFORMS STAIRS AND RAILS for coordination with supporting members.
  6. Section 07 21 00 - THERMAL INSULATION for building insulation.
  7. Section 07 54 00 PVC MEMBRANE ROOFING SYSTEM for coordination with roofing.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Schedule: Submit a list of locations where structural thermal breaks are to be used, and the specific thermal break product and thickness to be used at each location.
- C. Shop Drawings: Submit shop drawings showing details of construction, and relationship of structural thermal break material with adjacent construction including fastening and/or anchorage connection details, Armatherm thermal break material size and thickness.
- D. Thermal Design: Wall assembly or interface detail shall meet the ASHRAE 90.1 requirements for continuous insulation and shall not have structural connections (beams,

support framing, sub girts, clips) which create thermal bridging. Effective U values of wall, roof and foundation assemblies shall meet or exceed the design requirements per code. Effective U value calculation or modeling shall be performed in accordance with ASHRAE guidelines.

- E. Structural Design: Design structural thermal break connections and/or façade attachment support framing using performance requirements and design criteria indicated. Provide comprehensive engineering analysis by a qualified professional engineer.
- F. Test Report indicating compliance with ASTM Surface Burning Characteristics: ASTM E84.

### 1.3 QUALITY ASSURANCE

- A. Manufacturer: Minimum of 5 years' experience producing similar products.
- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Storage and Handling: Comply with manufacturer's recommendations for storage and handling. Protect from weather damage.

### 1.5 WARRANTY

- A. Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

ICC-ES Report not offered by all manufacturers. As a result we list 3 other manufacturers here and require an ASTM E84 Class A report under submittals.

- A. Basis of Design Manufacturer: Provide ClimaSpec TB by Climaspec. Subject to compliance with requirements, and equivalence as determined by the Architect, products by one of the following may also be acceptable:
  - 1. Armatherm.
  - 2. Fabreeka a Stabilus Company.
  - 3. Schok.
  - 4. Products shall carry current Test Report indicating compliance with ASTM E84 Surface Burning Characteristics to be acceptable for inclusion in the Project.

## 2.2 REINFORCED THERMOSET THERMAL BREAKS

- A. Structural Thermal Break Material: Armatherm FRR reinforced thermoset resin with the following attributes:
1. Compressive Strength: ASTM D638 40,000 psi.
  2. Compressive Modulus: ASTM D695 673,400 psi.
  3. Shear Strength: ASTM D732 16,000 psi.
  4. Thermal Conductivity: ASTM C518 1.05 BTU in/ hr sf degree F.
  5. Coefficient of Thermal Expansion: ASTM E831  $2.2 \times 10^{-6}$  in/in/degree F.
  6. Thermal Resistance (R value): ASTM C518 0.95 hr sf degree F/ BTU.
  7. Surface Burning Characteristics: ASTM E84.
    - a. Flame Spread: 25 (class A).
    - b. Smoke Developed: 50 (class A).
  8. Accessories: Armatherm FRR bushings and washers as applicable to location. Armatherm washers shall be minimum 0.25 inch thick. Armatherm bushing and washer to provide thermal break between steel washer/bolt and internal structural steel..
  9. Thickness: 1 inch minimum; coordinate with Drawings.
- B. Structural Performance: Provide structural thermal break material at exterior steel to interior steel or any framing connection that bypasses the continuous insulation. Provide structural thermal break material and connections capable of withstanding and/or transferring the following design loads:
1. Shear, moment and wind loads as indicated.
  2. Design structural thermal break to allow for fabrication and construction tolerances, accommodate live load deflection, shrinkage and creep of the building structure and other building movements as required by (applicable building code). Maintain structural steel deflections per AISC 360.
  3. Submit independent test results or engineered performance analysis for structural thermal break material in bearing and/or slip critical connections where shear and moment loads are applied.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install thermal breaks in accordance with manufacturer's instructions and approved submittals and the following:

1. Install in proper relationship with adjacent materials.
2. Include accessory products including bushings and washers.
3. Protect from damage until acceptance.

END OF SECTION