

SECTION 07221

ROOF INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof insulation and installation.
- B. Support system and installation.

1.2 RELATED SECTIONS

- A. Section 05120 - Structural Steel.
- B. Section 05210 - Steel Joists.
- C. Section 07213 - Batt Insulation.
- D. Section 07421 - Composite Metal Building Panels.
- E. Section 07611 - Custom Sheet Metal Roofing.
- F. Section 13121 - Pre-Engineered Buildings.

1.3 REFERENCES

- A. ASTM C 236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
- B. ASTM C 518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- E. FS HH-I-558B - Insulation, Blocks, Boards, Blankets, Felts, Sleeving, (Pipe and Tube Covering), and Pipe Fitting Covering, Thermal (Mineral Fiber, Industrial Type).

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.

- B. Product Data: Manufacturer's specifications and installation instructions.
- C. Shop Drawings: Include layout and location of structural steel roof framing members, details and locations of support system components, and specific data about insulation, including:
 - 1. R value.
 - 2. Approximate thickness.
 - 3. Facing type.
 - 4. Roll widths.
 - 5. Lengths and locations.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of local building code.
- B. Conform to requirements of _____.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened packaging, with identifying tags or labels intact and legible.
- B. Coordinate scheduling for timely deliveries and prompt installation of materials.
- C. Store insulation and support system in a dry, protected area. If storage area is outdoors, store material off the ground and protected by a suitable waterproof cover. If installation is delayed for an extended period, open bag ends to allow for ventilation.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Handle and install insulation system only under conditions and temperatures that allow the facing material to remain workable.
- B. Coordinate insulation placement to assure that material can be covered promptly with roof panels. Do not leave insulation exposed overnight or to inclement weather.

1.8 WARRANTY

- A. Provide manufacturer's standard warranty, in accordance with requirements of Section 01740 - Warranties.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Products of this section are based on the MI-T-R roof insulation system as manufactured by Mizell Bros. Co., located at 99 Armour Drive N.E., Atlanta Georgia 30324. Telephone: 404-875-9361.
 1. Substitutions are not acceptable.

2.2 MATERIALS

- A. Insulation:
 1. Comply with FS HH-I-558, Form B, Type 1, Class 6.NOTE **
 2. Provide thermal resistance (R) of 19 and a calculated transmittance (U Value) of 0.05, as determined by ASTM C 518.
 3. Provide thermal resistance (R) of 26 and a calculated transmittance (U Value) of 0.04, as determined by ASTM C 518.NOTE **
 4. Provide thermal resistance (R) of 30 and a calculated transmittance (U Value) of 0.03, as determined by ASTM C 518.
 5. Provide thermal resistance (R) of 31 and a calculated transmittance (U Value) of 0.03, as determined by ASTM C 518.
 6. Provide thermal resistance (R) of 36 and a calculated transmittance (U Value) of 0.027, as determined by ASTM C 518.
 7. Provide thermal resistance (R) of 38 and a calculated transmittance (U Value) of 0.025, as determined by ASTM C 518.NOTE **
 8. Thickness: Approximately ___ inches, providing a composite U Value of ____, determined in accordance with ASTM C 236, using 8 inch Z purlins 60 inches on center, fasteners at ___ inches on center, [with] [without] foam blocks, 45 degrees F mean temperature corrected to 15 mph wind outside, heat flow up, non-reflective facing.
 9. Vapor Barrier: Face one side of insulation with white vinyl reinforced polyester having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.

10. Vapor Barrier: Face one side of insulation with white vinyl scrim polyester, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
11. Vapor Barrier: Face one side of insulation with standard duty foil scrim kraft, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
12. Vapor Barrier: Face one side of insulation with UV stabilized white polypropylene/scrim/foil, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
13. Vapor Barrier: Face one side of insulation with heavy duty vinyl scrim foil, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
14. Vapor Barrier: Face one side of insulation with standard duty vinyl scrim foil, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
15. Vapor Barrier: Face one side of insulation with heavy duty polypropylene scrim kraft, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
16. Vapor Barrier: Face one side of insulation with standard duty polypropylene scrim kraft, having a maximum perm rating of 0.02 as determined in accordance with ASTM E 96.
17. Vapor Barrier: Face one side of insulation with light duty foil scrim kraft, having a maximum perm rating of 0.03 as determined in accordance with ASTM E 96.
18. Vapor Barrier: Face one side of insulation with white polypropylene scrim kraft, having a maximum perm rating of 0.090 as determined in accordance with ASTM E 96.
19. Vapor Barrier: Face one side of insulation with white vinyl reinforced vinyl, having a maximum perm rating of 0.90 as determined in accordance with ASTM E 96.
20. Vapor Barrier: Face one side of insulation with white vinyl, having a maximum perm rating of 1.0 as determined in accordance with ASTM E 96.
21. Surface Burning Characteristics: Provide assembly of facing, adhesive, and glass fiber blanket with composite flame spread rating of 25 or less and smoke

developed of 50 or less, as determined in accordance with ASTM E 84.

B. Support System

1. Hangers and Stirrups: Preformed 26 gage galvanized steel, 7/8 inches wide, with prepunched holes, factory-applied white coating, and pressure-sensitive foam tape factory-applied to inside face.
 - a. Depth: 4 inches for R19 insulation.
 - b. Depth: 6 inches for R26 insulation.
 - c. Depth: 7 inches for R30 insulation.
 - d. Depth: 7 inches for R31 insulation.
 - e. Depth: 7 inches for R36 insulation.
 - f. Depth: 7 inches for R38 insulation.
2. Channels: Preformed 26 gage galvanized steel, die formed and sheared to length, with slotted hole 1 inch from each end for attachment to hangers and stirrups, and factory-applied white coating.
3. Fasteners: Manufacturer's standard nylon and electrostatically galvanized splice fasteners and washers.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that roof framing system is complete and ready to receive insulation system. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install roof insulation in strict accordance with manufacturer's instructions and approved shop drawings.
- B. Install one inch thick thermal blocks of extruded polystyrene on top of glass fiber tab and between standing seam roof panel clips.
- C. Install one inch thick thermal blocks of extruded polystyrene in accordance with instructions provided by roof panel manufacturer.

END OF SECTION