

SECTION 07211

REFLECTIVE INSULATION/RADIANT BARRIER MATERIAL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reflective Insulation/Radiant Barrier Material.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry.
- B. Section 13120 - Pre-Engineered Buildings.
- C. Section 15100 - Building Services Piping.
- D. Section 15810 - Ducts.

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 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM C 1224 - Specification for Reflective Insulation for Building Applications.
- D. ASTM D 635 - Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- E. ASTM D 3310 - Test Method for Determining Corrosivity of Adhesive Materials.
- F. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. ASTM E 96 - Test Methods for Water Vapor Transmission of Materials.
- H. ASTM E 408 - Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.

I. Mil-STD-810D - Fungus Resistance.

1.4 DEFINITIONS

- A. Radiant Barrier System (RBS): Radiant barrier material is sight-exposed to building interior, not concealed in system by subsequent building finishes.
- B. Reflective Insulation System (RIS): Reflective insulation material is concealed in system by subsequent building finishes; additionally, RIS incorporates air spaces between the two reflective surfaces.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's descriptive literature for reflective insulation material; indicate compliance to specified product characteristics, including documentation of code compliance, if documentation is required.
- C. Verification Samples: Two samples, minimum size 8 inches (203 mm) square, of actual products to be installed.
- D. Quality Assurance Submittals: Manufacturer's printed installation instructions for each indicated project condition; include recommended fastening materials and techniques.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Reflective Insulation/Radiant Barrier Material approved for indicated use by the following:
 - 1. Canadian Building Authority.
 - 2. California Code Regulations.
 - 3. City of Los Angeles CA Code Regulations.
 - 4. Dade County, Florida
 - 5. Australian Standards for Insulation.
- B. Mark materials to indicate code compliance in accordance with requirements of regulating authority before delivery of materials to project site.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products of this section in manufacturer's unopened packaging until installation; maintain storage conditions recommended by manufacturer. Store in clean, dry area. Do not expose to rain, dew, or snow while still in roll form.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Reflective Insulation/Radiant Barrier Material:
 - 1. Acceptable product: Astro-Foil, marketed by Astro-Foil; 10653 West 181st Avenue, Lowell, IND 46356-9451. ASD. Tel: (800) 776-3645 or (219) 696-3639, Fax: (800) 551-3645 or (219) 696-5220.
 - 2. Requests for substitution will be considered in accordance with provisions of Section 01600.
 - 3. Substitutions: Not permitted.
 - 4. Product description: Two layers of polyethylene bubble film, sandwiched between two layers of aluminum foil; fungi-resistant material having the following characteristics:
 - a. Thickness: Nominal 5/16 inch (8 mm).
 - b. Weight: 1.25 ounces per square foot (382 grams per square meter).
 - c. Flame spread/smoke developed rating, in accord with ASTM E 84: 10 Flame/25 Smoke.
 - d. Fire rating: NFPA Class A/UBC Class 1.
 - e. Linear shrinkage: None.
 - f. Puncture resistance: 66 pounds per square inch (455 kPa).
 - g. R-value, in accord with ASTM C 236: 13.55 (2.386 square meters per degree Kelvin per watt) down; 9.41 (1.657 square meters per degree Kelvin per watt) horizontal; 7.74 (1.363 square meters per degree Kelvin per watt) up.
 - h. U-value: 0.073 (0.414 watts per square meter per degree Kelvin) down; 0.106 (0.601 watts per square meter per degree Kelvin) horizontal; 0.129 (0.732 watts per square meter per degree Kelvin) up.
 - i. Emittance, in accord with ASTM E 408: 0.03-0.04.
 - j. Reflectivity: 0.96 - 0.97.
 - k. Degradation: 0.
 - l. Perm rating, in accord with ASTM E 96: 0.002 perm (0.114 ng/Pa s per square meter).
 - m. Roll width: Nominal 4 feet (1220 mm).
 - n. Roll width: Nominal 6 feet (1830 mm).

- B. Reflective Insulation/Radiant Barrier Material:
1. Acceptable product: Astro-E, marketed by Astro-Foil; 10653 West 181st Avenue, Lowell IND 46356-9451. ASD. Tel: (800) 776-3645 or (219) 696-3639. Fax: (800) 551-3645 or (219) 696-5220.
 2. Requests for substitution will be considered in accordance with provisions of Section 01600.
 3. Substitutions: Not permitted.
 4. Product description: One layer of polyethylene bubble film sandwiched between two layers of aluminum foil; fungi-resistant material having the following characteristics:
 - a. Thickness: Nominal 3/16 inch (4.76 mm).
 - b. Weight: 0.811 ounces per square foot (247 grams per square meter).
 - c. Flame spread/smoke developed rating, in accord with ASTM E 84: 15 Flame/30 Smoke.
 - d. Fire rating: NFPA Class A / UBC Class 1.
 - e. Linear shrinkage: None.
 - f. Puncture resistance: 63 pounds per square inch (434 kPa).
 - g. R-value, in accord with ASTM C 236: 14.5 (2.553 square meters per degree Kelvin per watt) down; 7.0 (1.232 square meters per degree Kelvin per watt) horizontal; 4.9 (0.862 square meters per degree Kelvin per watt) up.
 - h. U-value: 0.077 (0.437 watts per square meter per degree Kelvin) down; 0.109 (0.619 watts per square meter per degree Kelvin) horizontal; 0.119 (0.675 watts per square meter per degree Kelvin) up.
 - i. Emittance, ASTM E 408: 0.03 - 0.04.
 - j. Reflectivity: 0.96 - 0.97.
 - k. Degradation: 0.
 - l. Perm rating, according to ASTM E 96: 0.002 perm (0.114 ng/Pa s per square meter).
 - m. Roll width: Nominal 4 feet (1220 mm).
 - n. Roll width: Nominal 6 feet (1830 mm).
- C. Fasteners: Type and size recommended by manufacturer for project conditions.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Ensure that electrical wiring adjacent to reflective insulation/radiant barrier material installations is in good condition.

3.2 PREPARATION

- A. Turn off electricity in each area of reflective insulation/radiant barrier material installation until installation in that area is complete.

3.3 INSTALLATION

- A. Install reflective insulation/radiant barrier material in accordance with drawing details and manufacturer's installation instructions.
- B. Maintain minimum 3 inches (76 mm) distance from heat-producing devices such as furnaces, chimneys, blowers, and lighting fixtures.
- C. Maintain minimum 3/4 inch (19 mm) air space each side of reflective insulation/radiant barrier material.

3.4 SCHEDULE

- A. Locations:
 1. Over roof trusses/rafters, encapsulated (RIS).
 2. Over roof trusses/rafters, exposed (RBS) (RIS).
 3. Interior side of wall studs/furring, exposed (RBS) (RIS).
 4. Interior side of wall studs/furring, encapsulated (RIS).
 5. Underside of floor joists/trusses, exposed (RBS) (RIS).
 6. Underside of floor joists/trusses, encapsulated (RIS).
 7. Underside of first floor joist/trusses at crawl spaces, exposed (RBS) (RIS).
 8. Below interior ceiling joists/trusses/rafters, exposed (RBS) (RIS).
 9. Below interior ceiling joists/trusses/rafters, encapsulated (RIS).
 10. Over metal roof purlins, exposed (RBS) (RIS).
 11. Over metal roof purlins, encapsulated (RIS).
 12. Exterior side of metal wall purlins, encapsulated (RIS).
 13. Interior side of upward-acting sectional doors, exposed (RBS).
 14. Wrap HVAC supply ducts, exposed (RIS) (RBS).
 15. Wrap water heaters, exposed (RIS) (RBS).

16. Wrap water supply piping, exposed (RIS) (RBS).

END OF SECTION