

**SECTION 07 22 00**  
**ROOF AND DECK INSULATION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Installation of roof and deck insulation, cant strips, and vapor retarder on new construction ready to receive roofing or waterproof membrane.
- B. Alteration work to existing roof insulation.

**1.2 RELATED WORK**

- A. Wood blocking and edge strips: Section 06 10 00, ROUGH CARPENTRY.
- B. Sheet metal components: Section 07 60 00, FLASHING AND SHEET METAL.

**1.3 QUALITY CONTROL**

- A. Supervision of work by persons that are knowledgeable and experienced in roofing. See submittals for documentation of supervisor's qualification.
- B. Unless specified otherwise, comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to insulation for storage, handling, and application.

**1.4 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Roof insulation, each type
  - 2. Fastening requirements
- C. Samples:
  - 1. Roof insulation, each type
  - 2. Nails and fasteners, each type
- D. Certificates:
  - 1. Indicating type, thickness and thermal conductance of insulation.  
(Average thickness for tapered insulation).
- E. Laboratory Test Reports: Thermal values of insulation products.
- F. Layout of tapered roof system showing units required.
- G. Documentation of supervisors training and experience showing knowledge of roofing procedures.

**1.5 DELIVERY, STORAGE AND MARKING**

- A. Deliver materials to the site in original sealed packages or containers marked with the name and brand, or trademark of the manufacturer or seller.
- B. Keep materials dry, and store in dry, weathertight facilities or under canvas tarps. Use of polyethylene or plastic tarps to cover materials is not permitted. Store above ground or deck level on wood pallets. Cover ground under stored materials with plastic tarp.
  - 1. Store rolled materials (felts, base sheets, paper) on end. Do not store materials on top of rolled material.
  - 2. Store foam insulation away from areas where welding is being performed and where contact with open flames is possible.
- C. Protect from damage from handling, weather and construction operations before, during, and after installation.

**1.6 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Federal Specifications (Fed. Spec.):
  - UU-B-790A.....Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)
- C. American Society for Testing and Materials (ASTM):
  - C1289-07.....Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
  - F1667-05.....Driven Fasteners: Nails, Spikes, and Staples
- D. Factory Mutual Global (FM):
  - 1-28.....Winds Loads to Roof Systems and Roof Deck Securement
  - P7825-05.....Approval Guide
- E. National Roofing Contractors Association (NRCA):
  - The NRCA Roofing Manual 2009
- F. Underwriters Laboratories, Inc. (UL):
  - Fire Resistance Directory (2009)
- G. U.S. Department of Commerce (NBS):
  - PS 1-07.....Structural Plywood
- H. National Particleboard Association (NPA):
  - A208.1-93.....Mat-Formed Wood Particleboard

## **PART 2 - PRODUCTS**

### **2.1 INSULATION**

#### **A. INSULATION**

1. Rigid polyisocyanurate board, with a strong white or black fibrous glass facer conforming to or exceeding the requirements of ASTM C 1289 / FS HH-I-1972. EnergyGuard™ Tapered Polyiso, by BMCA® with the following characteristics:
  - a. Board Thickness: tapered
  - b. Thermal Resistance (LTTR value) of: varies
  - c. Compressive Strength: 20 psi
  - d. Minimum thickness of tapered sections; 13 mm (1/2 inch), unless manufacturers allow taper to zero mm (inch).

#### **B. INSULATION ACCESSORIES**

- 1 Cant Strip: Factory fabricated rigid perlite strip cut at angles to provide a true 45° Angle between horizontal and vertical surfaces, EnergyGuard™ Perlite Cant Strip, by BMCA®
- 2 Tapered Edge Strip: Factory fabricated rigid perlite strip cut at angles to provide a smooth transition between differences in elevation. EnergyGuard™ Tapered Edge Strip, by BMCA®

### **2.2 RECOVERED MATERIALS**

- A. Comply with following minimum content standards for recovered materials:

Material Type	Percent by Weight
Plastic rigid foams: Polyisocyanurate/polyurethane	
Rigid foam	9 percent recovered material

- B. The minimum-content standards are based on the weight (not the volume) of the material in the insulating core only.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Do not apply roof insulation if deck will be used for subsequent work platform, storage of materials, or staging or scaffolding will be erected thereon.
- B. Entire roof deck construction of any section of the building shall be completed before insulation system work is begun. Curbs, blocking, edge strips, and other components which insulation, roofing and base

flashing is attached to shall be in place ready to receive insulation and roofing. Coordinate roof insulation operations with roofing and sheet metal work so that insulation is installed to permit continuous roofing operations.

- C. Insulation system materials shall be dry and damage free when applied. Do not use warped, wet, broken insulation or insulation with damaged facings. Remove damaged insulation from the site immediately.
- D. Dry out surfaces that become wet from any cause during progress of the work before roofing work is resumed. Apply materials only to dry substrates.
- E. Except for temporary protection specified, do not apply materials during damp or rainy weather, during excessive wind conditions, nor while moisture (dew, fog, snow, ice) or frost is present in any amount in or on the materials when temperature is below 10 °C (50 °F). Do not apply materials to substrate having temperature of 10 °C (50 °F) or less.
- F. Phased construction is not permitted. The complete installation of all flashing, insulation, and roofing shall be completed in the same day except for the area where temporary protection is required when work is stopped.
- G. Temporary Protection for Built-Up Roofing:
  - 1. Install temporary protection consisting of glaze coats and water cutoffs at the end of each day's work and when work is halted for an indefinite period or work is stopped when precipitation is imminent.
  - 2. Glaze coat all exposed surfaces of insulation and felts to seal within the bitumen coating. No insulation or felt surfaces or edges shall be left exposed.
  - 3. Provide water cutoffs at exposed edges of insulation. Cutoffs shall consist of two plies of felt. The first ply extending 150 mm (six inches) beyond edge of roof insulation, the roof deck and the built-up roofing. The second ply covering the first ply and extending 75 mm (three inches) beyond the first. Install as specified for vapor retarder. When the work resumes, cut the protective felts along the vertical face of insulation and remove, exposing the edges of the insulation.
  - 4. Securely anchor insulation in place to prevent blow off and damage by construction activities.
  - 5. Provide for removal of water or drainage of water away from work.

6. For roof areas that are to remain intact and that are subject to foot traffic and damage, provide wood walkways with notches in sleepers to permit free drainage.

### **3.2 SURFACE PREPARATION**

- A. Sweep decks to broom clean condition. Remove all dust, dirt or debris.
- B. Remove projections that might damage materials.
- C. Existing Roofs:
  1. At areas to be altered, coordinate all work with existing roof warranty

### **3.3 VAPOR RETARDER**

- A. General:
  1. Install a continuous vapor retarder on all roof decks as specified.
  2. At vertical surfaces, turn up vapor retarder to top of insulation or base flashing.
  3. At all pipes, walls, and similar penetrations through vapor retarder, seal openings with roof cement to prevent moisture entry from below.
  4. Mop felts solidly in place as specified.
  5. Seal penetrations with roof cement.

### **3.4 SELECTION OF RIGID INSULATION**

- A. Insulation Thickness:
  1. Thickness of roof insulation shown on drawings is nominal. Actual thickness shall provide the thermal resistance "R" value of not less than 13 for uniform thickness. (average thickness where tapered insulation is used)
  2. When thickness of insulation to be used is more or less than that shown on the drawings, make adjustments in the alignment and location of roof drains, flashing, bitumen stops, fascias and similar items at no additional cost to the Government.
  3. Where tapered insulation is used, the thickness of the insulation at high points and roof edges shall be as shown on the drawings; the thickness at the low point (drains) shall be as shown on drawings.
  4. Use not less than two layers of insulation when insulation is 25 mm (one inch) or more in thickness unless specified otherwise.

### 3.5 INSTALLATION OF INSULATION

#### A. BASE LAYER

1. The substrate must be free of any debris, dust, dirt, oil, grease, and standing water before applying the adhesive.
2. OlyBond 500 must be applied using the specially designed PaceCart dispenser. OlyBond 500 SpotShot shall be applied using one of the specially designed dual cartridge dispensers.
3. Install insulation layers applied with bands of Oly Bond 500 spaced 12" O.C. Approximate coverage rate is  $\frac{1}{2}$  to 1 gallon per 100 square feet, depending on the substrate. Allow the foam to rise  $\frac{3}{4}$ " to 1". Walk each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6" (15.2 cm) to eliminate continuous vertical gaps.

B. Lay insulating units with close joints, in regular courses and with cross joints broken. Install insulation boards snug. Gaps between board joints must not exceed 1/4" (6 mm). All gaps in excess of 1/4" (6 mm) must be filled with like insulation material.

C. When laid in more than one layer, break joints of succeeding layers of roof insulation with those in preceding layer.

D. Lay units with long dimension perpendicular to the rolled (longitudinal) direction of the roofing felt.

E. Do not kick insulation boards into place.

#### F. INSULATION - SUBSEQUENT LAYERS

1. The substrate must be free of any debris, dust, dirt, oil, grease, and standing water before applying the adhesive.
2. OlyBond 500 must be applied using the specially designed PaceCart dispenser. OlyBond 500 SpotShot shall be applied using one of the specially designed dual cartridge dispensers.
3. Install insulation layers applied with bands of Oly Bond 500 spaced 12" O.C. Approximate coverage rate is  $\frac{1}{2}$  to 1 gallon per 100 square feet, depending on the substrate. Allow the foam to rise  $\frac{3}{4}$ " to 1". Walk each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6" (15.2 cm) to eliminate continuous vertical gaps.

G. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.

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- H. Cover all insulation installed on the same day by either:
  - 1. The roofing membrane as specified.
  - 2. Temporary protection as specified.
- I. Seal all cut edges at penetrations and at edges against blocking with bitumen or roof cement.
- J. Cut to fit tight against blocking or penetrations.
- K. Cant strips must be installed at the intersection of the roof and all walls, parapets, curbs, or transitions approaching 90°, to be flashed. They shall be approximately 3" (10.2 cm) in horizontal and 3" (10.2 cm) in vertical dimension. The face of the cant shall have an incline of not more than 45 degrees with the roof.

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