

SPF Roof System

Section 07 57 00
Coated Foam Roofing

PART 1 – GENERAL

1.1 Description

- A. Work included: all labor, materials, equipment and accessories to provide the following:
 - 1. Prepare surfaces to receive insulation in accordance with insulation manufacturer's application requirements.
 - 2. Apply spray polyurethane foam roof insulation over substrate approved by insulation manufacturer in accordance with manufacturer's requirements.
- B. Related work specified elsewhere:
 - 1. Fluid applied roof membrane: Section 075556-Fabric Reinforced System
 - 2. Sheet metal work
 - 3. Roof accessories

1.2 Quality Assurance

- A. Certification of materials: Conklin Company Inc. shall furnish, upon request written, notarized certification that the material furnished meets the physical properties set forth in this specification.
 - 1. Foam applicator's qualifications: Applicator shall be **trained** and have experience with the proper application of the material being applied. Applicator shall be **licensed** or otherwise **approved** by manufacturer of material being specified.
- B. Requirements of regulatory agencies: furnished and install all roofing materials required to meet regulatory specifications and approved building codes. If changes are required to drawings or specification in order to meet requirements of regulatory agencies specified, or to provide guarantee specified, cost of such changes shall be included. Any changes to drawings or specifications shall be approved by the architect before work commences.
 - 1. Underwriters Laboratories: polyurethane material shall have UL classification numbers when required by governing codes. Refer to UL Roofing Materials and System Directory for specific details.

1.3 Submittals

- A. Shop drawings: shall include outline of roof and roof size, location and type of penetration, perimeter and penetration details, and special details, as well as location of anchors and bill of materials.
- B. Product data: shall include manufacturer's product specifications and installation instructions.

- C. Certified test: Submit copies of certified test reports that indicate compliance with the specified minimum physical properties and performance requirements.

1.4 Product Delivery, Storage and Handling

A. Delivery of materials:

1. Spray Polyurethane Foam

- a. All materials associated with the foam system shall be delivered to the job site in an appropriate standard commercial container bearing the manufacturer's original label with the following information:
 - (i) Name of manufacturer.
 - (ii) Name of contents.
 - (iii) Net weight of contents.
 - (iv) Lot or batch number.
 - (v) Recommended storage temperature range.
 - (vi) A "caution" label giving safety instruction for handling and store temperature range.
 - (vii) Mixing instructions
- b. Storage of materials: store materials in accordance with manufacturer's recommendations.
- c. Handling and protection of materials: meet requirements of manufacturer's recommendations for handling and protection of materials during installation. Handle materials so that they are not contaminated by foreign substances.
- d. Damaged materials: contaminated or damaged materials shall not be used in the installation and shall be removed from site immediately upon discovery
- e. **SAFETY & FIRST AID**
See product Safety Data Sheets or product container label to review safety information provided.

B. Fluid Applied Elastomeric Latex Roof Membrane

- a. Membrane materials shall be delivered to the job site in Conklin Company's original, unopened containers bearing manufacturer's original label.
- b. Related miscellaneous items shall be delivered to job site in new condition, and where applicable, properly labeled.
- c. Storage of materials:
 - (i) Store materials in accordance with manufacturer's recommendations.
 - (ii) Store acrylic latex materials at 40°F to 100°F.
- d. Handling and protection of materials:
 - (i) Meet requirements of manufacturer's recommendations for handling and protection of materials during installation.
- e. Handle materials so that they are not contaminated by foreign materials.
- f. Damaged materials: contaminated or damaged materials shall not be used in the installation and shall be removed from site immediately upon discovery.

g. **SAFETY & FIRST AID**

See product Safety Data Sheets or product container label to review safety information provided.

1.5 Job Conditions

A. Spray Polyurethane Foam

1. Environmental requirements:
 - a. General requirements: application of coatings shall not proceed unless environmental conditions are suitable as prescribed by the manufacturer of the material being supplied. Applicator shall be held responsible for contacting manufacturers of applied materials and verifying manufacturer's requirements for environmental conditions
 - b. Application temperature requirements:
 - (i) Ambient: application shall not proceed when ambient temperature is less than 40°F and rising or greater than 100°F.
 - (ii) Surface: application shall not proceed when surface temperature is less than 40°F and rising or greater than 120°F.
 - (iii) Do not apply at temperatures below 40°F, when temperatures may drop below 40°F within 24 hours, or when the temperature is not at least 5°F above the dew point. Do not apply during inclement weather, when precipitation appears imminent, or when freezing may occur before the membrane is fully cured.
2. Protection of unrelated work: take all measures necessary to protect unrelated work and surfaces to avoid overspray from coatings.
3. Health and safety procedures: adhere to health and safety procedures of product manufacturers, governing codes and as follows.
 - a. Respiratory protective devices:
 - (i) Type: respiratory protective equipment shall be worn by all personnel involved in the application of foam. Respiratory protective devices shall be appropriate to the hazardous material involved and the extent and nature of the work performed.
 - (ii) Instruction: employees required to use respiratory protective devices shall be instructed in their use.
 - (iii) Inspection: respiratory protective equipment shall be inspected regularly and maintained in good condition.
 - b. Eye and face protection: provide eye and face protection for persons working with material.
 - c. Skin protection: protective clothing and gloves shall be worn. Skin areas not covered by clothing can be protected by suitable protective creams.
 - d. Protection against ignition or explosion: smoking, open flames, high temperatures, welding or electric sparks shall be strictly prohibited during application. Post conspicuous and legible signs prohibiting smoking in application and material storage areas.

B. Fluid Applied Elastomeric Latex Roof Membrane

1. Environmental requirements:
 - a. General requirements: application of Rapid Roof® III, Equinox®, Benchmark®, PUMA® XL shall not proceed unless environmental conditions

are suitable as prescribed by the manufacturer of the material being supplied. Applicator shall be held responsible for contacting manufacturers of materials being applied and verifying manufacturer's requirements for environmental conditions.

- b. Application temperature requirements:
 - (i) Ambient: application shall not proceed when ambient temperature is less than 40° F and rising or greater than 100° F.
 - (ii) Surface: application shall not proceed when surface temperature is less than 40° F and rising or greater than 120° F.
- c. Protection of unrelated work: take all measures necessary to protect unrelated work and surfaces not to receive coatings overspray.

PART 2—PRODUCTS

2.1 Materials

A. Spray Polyurethane Foam

- 1. Acceptable manufacturers: as approved by membrane manufacturer.
- 2. General description: polyurethane foam insulation shall be a two-component system formulated for existing climatic conditions.
- 3. Physical and performance requirements: polyurethane foam shall meet the following minimum requirements when tested in accordance with standard indicated:
 - a. Density (ASTM D1622): 2.8-3.0 lbs./cu. ft. in place.
 - b. Compressive strength parallel (ASTM D1621): 40 psi minimum at yield.
 - c. Tensile Strength parallel (ASTM D1623): 60 psi.
 - d. Shear strength perpendicular (ASTM C273): 35 psi.
 - e. Thermal conductivity (ASTM C177): 12 max. BTU/sq. ft./°F/in. (ungaged).
 - f. Closed cell content (ASTM D1940): 90% minimum.
 - g. Water absorption (ASTM D5270): 0.10 lbs./sq. ft.
 - h. Dimensional stability (ASTM D2126): 28 days, 15% maximum
 - i. Flammability: Class A (ASTM E108) or Underwriters Laboratory 790.

B. Fluid Applied Elastomeric Latex Roof Membrane

1. Acceptable manufacturer: Conklin Company Inc., Shakopee Minn., Rapid Roof® III, Equinox®, Benchmark & PUMA® XL
2. Product Description:
 - a. Rapid Roof III is an acrylic latex, elastomeric, monolithic roofing coating system designed for use on spray-in-place polyurethane foam insulation, consisting of a light tan base coat and a hi-hide white top coat.
 - b. Equinox is an acrylic latex, elastomeric, monolithic roofing coating system designed for use on spray-in-place polyurethane foam insulation, consisting of a light tan base coat and a hi-hide white top coat.
 - c. Benchmark is an acrylic latex, elastomeric, monolithic roofing coating system designed for use on spray-in-place polyurethane foam insulation, consisting of a light blue base coat and a hi-hide white top coat.
 - d. PUMA XL is a modified acrylic latex, elastomeric, monolithic roofing coating system designed for use on spray-in-place polyurethane foam insulation, consisting of a light blue base coat (Benchmark Base Coat) and a hi-hide white top coat.
3. Physical and performance requirements: the complete membrane consisting of base coat and top coat, shall meet the following minimum requirements when tested in accordance with the standard indicated.

*Reference individual specification sheets at www.conklin.com/roofing

2.2 Miscellaneous Materials

- A. Caulking: White, bronze or gray Kwik Kaulk® acrylic caulking compound or Conklin 360-S urethane sealant as approved by membrane manufacturer.
- B. Primer: Prime Time® as furnished by membrane manufacturer.
- C. Roofing granules: No 11 screen size, ceramic coated, color as selected by architect/owner. (optional)

PART 3.0A—EXECUTION OF SPRAY POLYURTHANE FOAM

3.1 Inspection

- A. General inspection requirements: inspect roof surface to ensure that the substrate shall be clean, dry, structurally sound, stable and well secured.
- B. Metal items: inspect metal items to ensure that they are securely attached.

3.2 Preparation

- A. Preparation of existing built-up and/or modified bitumen roof
 1. Built-up roofs which are in excess of two complete roof systems shall be removed down to the deck.

2. Built-up roofs which are severely alligatored (30% of a square or more), blistered, split, and cracked or brittle and exhibiting gravel turnover shall be removed down to the deck.
 3. Remove and replace wet insulation.
 4. Remove loose material and dirt from surface.
 5. Remove or repair blisters and major defects.
 6. Caulk and joint tape cracks, splits and minor defects.
 7. Apply primer material where necessary for proper adhesion.
- B. Preparation of metal deck
1. Remove all dirt, dust, loose rust and other contaminants by brushing, vacuuming or power blowing.
 2. Prime entire roof surface with Conklin's Encase® rust inhibiting primer.
- C. Preparation of plywood deck (or equal)
1. Plywood shall be free of dust, dirt, grease, oil and water prior to application of spray polyurethane foam.
- D. Preparation of concrete
1. Surface shall be free of dirt, contamination and loose material and dry at time of application.
 2. All areas of loose existing coating shall be removed.
 3. Spalled concrete and defects shall be repaired.
 4. Efflorescing concrete shall be acid etched followed by a thorough water rinse and drying of the concrete.
 5. A primer is recommended for concrete surfaces. Consult foam manufacturer regarding recommended concrete primers.
 6. Joints in excess of one-fourth inch shall be filled or taped as recommend by foam manufacturer.
 7. Check with foam manufacturers regarding approved concrete substrates.
- E. Preparation of insulation board or cover board
1. Surface shall be free of dirt, contamination and loose material and dry at time of application.
 2. Insulation/Cover board shall be fully adhered or mechanically fastened according to the manufacturer's specifications or Factory Mutual requirements.

3.3 Application

- A. General requirements: follow manufacturer's application instructions at all times.
- B. Application equipment: plural component, airless spray equipment.
- C. Application procedure:
1. Polyurethane foam shall not be applied during inclement weather conditions.
 2. Polyurethane foam shall be sprayed with a minimum lift thickness of ½" to reach required thickness.
 3. Minimum thickness for polyurethane system shall be no less than 1 ½".
 4. Roof surface shall be free of ponding water. A roof surface which has 36 or more square feet of water in any area, one-fourth inch deep or more, 48 hours after a rain, shall be considered unacceptable. All water shall drain off the roof. Small "bird baths" cannot account for more than 5% of the entire roof surface.

5. Polyurethane foam surface shall be free of voids, crevices, pinholes and ultraviolet degradation.
6. Texture of foam surface shall be no rougher than coarse orange peel.
7. Polyurethane foam shall receive coating (base coat or primer are acceptable) no earlier than two hour and no later than 24 hours following application.
8. If foam becomes wet during or after application, remove damaged areas and repair prior to coating.
If foam becomes wet after application, allow it to dry completely before coating is applied.

3.4 Field Quality Control

A. Quality control requirements for foam application: the applied foam system shall be periodically checked at various locations for:

1. Thickness
2. Adhesion to the substrate
3. Cellular structure
4. Lift adhesion
5. Surface texture
6. Blisters
7. Cracks
8. Mechanical damage
9. Degradation of surface

PART 3.0B—EXECUTION OF FLUID APPLIED ELASTOMERIC LATEX ROOFING MEMBRANE

3.1 Foam Inspection

A. Inspection of polyurethane foam: membrane shall be applied only to polyurethane foam insulation which meets the following requirements:

1. Roof surface shall be free of ponding water. A roof surface which has 36 or more square feet of water in any area, ¼ inch deep or more, 48 hours after a rain, shall be considered unacceptable. All water shall drain off the roof. Small “bird baths” cannot account for more than 5% of the entire roof surface.
2. Has surface texture between smooth and coarse orange peel. Texture of popcorn or tree bark shall not be acceptable.
3. Minimum thickness is not less than one inch.
4. Contains no blisters or tunneling.
5. Is securely bonded to substrate.
6. Has been exposed for a minimum of two hours and not longer than 24 hours before coating.
7. Is clean, dry, free of contaminants and capable of accepting membrane.
8. Has density of not less than 2.5 pounds per cubic foot.
9. Is free of pinholes and voids.

3.2 Foam Preparation

A. Caulking: apply Kwik Kaulk to all pinholes, voids and irregularities.

B. Cleaning: clean surface free of all contaminants which will affect bond of membrane to polyurethane foam.

3.3 Coating Application

A. Application method: Rapid Roof III, Equinox, Benchmark, PUMA XL base and top coat shall be applied by airless spray or $\frac{3}{4}$ " to 1 $\frac{1}{4}$ " inch nap roller.

B. Application rate:

1. Base coat: absolute minimum application rate for base coat shall be **1.9 gallons per square** on smooth foam for **Rapid Roof III and Benchmark.**

Equinox requires a minimum of 1.6 gallons per square. Texture/rough surfaces shall require addition coatings.

2. Top coat: absolute minimum application rate for top coat shall be **1.9 gallons per square** on smooth foam for **Rapid Roof III, Benchmark, and PUMA XL.**

Equinox requires a minimum of 1.6 gallons per square. Texture/rough surfaces shall require addition coatings.

3. Total thickness of membrane: combined thickness of base coat and top coat shall not be less than the 27 mils for Rapid Roof III, Equinox, Benchmark and PUMA XL.

C. Application procedure:

1. Develop a systematic method of application of coating to surface.

2. Allow each application to dry thoroughly prior to additional applications. Do not allow less than 12 hours drying time between coats.

3. Do not apply coating in excess of 2.0 gallons per square per coat.

4. Back roll base coat after application by airless spray.

5. Back rolling top coat is optional after application by airless spray.

D. Service walkways: where service walkways are indicated on drawings, provide the following additional work:

1. Walkways shall be constructed following complete drying of roof membrane system.

2. Mark off area and apply an additional base coat of Rapid Roof III, Equinox, Benchmark or PUMA XL at a rate of 1.5 gallon per square.

3. Embed 38 inch wide **Spunflex II** fabric into the wet coating and smooth out with roller.

4. Immediately overcoat the fabric with an additional 1/2 gallon per square of base coat permitting this application to dry completely.

5. Apply 1.9 gallons per square of Rapid Roof III, Benchmark, and PUMA XL (apply Equinox at 1.6 gallons per square) top coat and allow to dry.

6. Apply 1/3 gallon per square tinted Kolor Kote® top coat to walkways if a color other than white is desired.

END OF SECTION













