

# **ELASTUFF 101/102**

## **Over CONCRETE ROOFING**

### **MASTER GUIDE SPECIFICATION**

#### **SECTION 07545**

## ***Fluid-Applied Elastomeric Polyurethane Coating System***

### **PART 1 – GENERAL**

#### **1.01 RELATED WORK SPECIFIED ELSEWHERE**

- A. Rough Carpentry: Section 06100
- B. Board-Stock Roof Insulation: Section 07220
- C. Flashing & Sheet Metal: Section 07620
- D. Roof Accessories: Section 07800
- E. Prefabricated Expansion Joints: Section 07860
- F. Painting: Section 09900

#### **1.02 QUALITY ASSURANCE**

- A. Qualifications of Contractor
  1. The Contractor shall be approved by the Coatings Manufacturer for application of its roof coating products, and shall have a minimum of three (3) years experience in the application of elastomeric roof coatings.
  2. The Contractor shall provide a list of project references similar in nature to the one proposed, including contact names and telephone numbers.
- B. Qualifications of Manufacturer
  1. Manufacturer of the fluid-applied elastomeric polyurethane coating system shall have a proven 20-year track record of successful installations using elastomeric polyurethane technology in the roofing industry.
  2. Approved products shall be manufactured exclusively from elastomeric polyurethane resins.
  3. Other Manufacturer's products shall be considered only after submittal of product data files supporting quality and full compliance with specifications herein. The Architect or Owner reserves the right to reject the substitution proposals should it be determined they do not provide all functions required for application.
- C. Testing & Labeling
  1. The elastomeric polyurethane coating system must be U.L. 790 tested and classified as a Class A fluid-applied system, and be subject to U.L. follow-up service.
  2. Individual container labels must include the Manufacturer's name, product name, type and class of material, U.L. sticker with classification issue number, batch or lot number, mixing and application instructions, and precautions.

#### **1.03 SUBMITTALS**

- A. Submit manufacturer's literature, certificates and samples in a single package to the Architect or Owner in accordance with requirements specified in General Conditions and Division 1, General Requirements.
- B. Manufacturer's Literature: Literature on the protective coating, as well as related primers, sealants, reinforcement, etc., shall be submitted for review before work is started. Literature shall include material specifications, physical properties (including ASTM test methods utilized), Manufacturer's estimated application rate for required dry mil thickness per warranty requirements, current application instructions and MSDS.
- C. Applicator's Qualifications: Submit a copy of Approved Applicator letter and/or certificate as issued by the manufacturer of the elastomeric polyurethane coating system
- D. Warranty: Submit a copy of the coating manufacturer's warranty to meet project specifications.

#### **1.04 PRODUCT DELIVERY, STORAGE & HANDLING**

- A. Delivery of Materials: Materials shall be delivered to the jobsite in original, sealed containers with labels legible and intact.
- B. Storage of Materials: Materials shall be stored in an area specifically designed for that purpose, in accordance with manufacturer's recommendations, where temperatures will not be less than 50°F (10°C) or higher than 100°F (38°C).
- C. Material Handling: Materials shall be handled and installed per manufacturer's instructions and all applicable safety regulatory agencies.
- D. Damaged Materials: Contaminated, damaged or unsealed materials, or materials not conforming to the specified requirements shall not be used in the installation. Rejected containers shall be immediately removed from the jobsite and replaced at no additional cost to the Owner.

### 1.05 ENVIRONMENTAL CONDITIONS

- A. Install all materials in strict accordance with manufacturer’s published safety and weather precautions.
- B. Do not apply elastomeric polyurethane coating system components when the ambient and/or surface temperature is below 40°F (4°C) or above 110°F (43°C), or if any surface moisture is present. Do not apply if weather conditions will not permit complete cure before rain, dew, fog or freezing temperatures occur. Do not spray apply if the wind velocity exceeds 10 mph (16 kph) without taking precautions to eliminate overspray.
- C. Take all measures necessary to protect unrelated surfaces from coating overspray or spillage.

### 1.06 FIELD QUALITY CONTROL

- A. The overall weather conditions, including surface temperature, surface moisture, ambient temperature, relative humidity and wind velocity shall be recorded by the contractor, at designated time intervals, on the Daily Quality Control Report Form if so requested by the Architect or Owner.
- B. Verification of Protective Coating Thickness: The wet film thickness shall be measured and recorded daily, along with the quantity, batch numbers and total square feet applied, on the Daily Quality Control Form.

## **PART 2 – PRODUCTS**

### 2.01 DESCRIPTION

A seamless, fluid-applied polyurethane membrane system designed for application over concrete roof substrates. Approved system shall be UNITED COATINGS’ **ELASTUFF 101/102** Concrete Roof Coating System consisting of **ELASTUFF 101** Elastomeric Aromatic Polyurethane Basecoat and **ELASTUFF 102** Elastomeric Aliphatic Polyurethane Topcoat, **Uni-Crete**, **Uni-Tile Sealer LV**, **Roof Mate Mesh**, **Roof Mate Fabric** and **United Cleaning Concentrate (UCC)**.

### 2.02 MATERIALS

- A. Biodegradable Cleaner: **UNITED CLEANING CONCENTRATE (UCC)**, water-reducible non-phosphate cleaner, as supplied by coating manufacturer for use in cleaning concrete substrates prior to coating.
- B. Construction Grade Caulk: Any premium quality, single package urethane sealant for use in sealing cracks and seams, and at vertical/horizontal interfaces.
- C. Concrete Repair Material: **UNI-CRETE**, polymer concrete renovation and repair material, as supplied by Coating Manufacturer for use in filling voids, resurfacing spalled concrete surfaces and/or providing slope-to-drain as necessary to eliminate ponding water.
- D. Concrete Primer and Sealer: **UNI-TILE SEALER LV**, two-component, penetrating epoxy, as supplied by Coating Manufacturer for use in priming and sealing chalky or dusted concrete surfaces.
- E. Reinforcement Tape: **ROOF MATE MESH**, stitchbonded polyester, as supplied by Coating Manufacturer for reinforcing cracks, seams, vertical/horizontal interfaces and other detail areas.
- G. Reinforcement Fabric: **ROOF MATE FABRIC**, stitchbonded polyester fabric, as supplied by Coating Manufacturer for reinforcing large detail areas and for full fabric reinforcement.
- F. Fluid-Applied Elastomeric Finish: UNITED COATINGS’ **ELASTUFF 101//102** polyurethane coating system, as supplied by Coating Manufacturer to provide a seamless, weatherproof membrane over the existing concrete substrate.

### 2.03 PERFORMANCE REQUIREMENTS – FLUID-APPLIED ELASTOMERIC COATING

Fluid-applied silicone elastomeric topcoat, in the specified finish color, shall be internally plasticized to provide a permanently flexible, weather-resistant topcoat. It shall possess a Class “A” fire rating, as tested and certified by UL 790. Coating shall meet or exceed all the following properties:

<b>Volume Solids:</b>		<b>Abrasion Resistance:</b> Less than 35 mg weight loss using C-17 wheels & 1000 gm. Weights after 1,000 cycles on Taber Abraser (ASTM D4060)
<b>Basecoat</b>	80% (ASTM D2697)	<b>Fungi Resistance:</b> Zero Rating (ASTMG21)
<b>Topcoat</b>	65% (ASTM D2697)	<b>Water Absorption:</b> Basecoat < 1%, Topcoat < 2.5% weight gain after 7 days immersion in deionized water. (ASTM D543)
<b>Weight Solids:</b>		<b>Accelerated Weathering:</b> No cracking/checking, delamination loss of flexibility or chalking after 3,000 hours (ASTM G53)
<b>Basecoat</b>	>80% (ASTM D3697)	<b>Adhesion:</b> Minimum 350 psi- exceeds cohesive strength of the concrete (ASTM D4541)
<b>Topcoat</b>	>75% (ASTM D3697)	<b>Low Temp Flexibility:</b> Passes 180 degree flex over 1/8” (3 mm) mandrel at -7°F (-22°C), (Federal Test Method No. 141a-6221)
<b>Initial Tensile Strength:</b>	(ASTM D412)	<b>Low Temperature Impact Resistance:</b> No surface cracks or breaks when impacted with 130 gm, 1¼” (3.2 cm) steel ball dropped from a height of 5’ (1.5 m) at – 12°F (-25°C).
(Minimum Stress)	Minimum 1,000 psi (± 100)	
<b>Basecoat</b>	Minimum 2,500 psi (± 200)	
<b>Topcoat</b>	(ASTM D412)	
<b>Initial % Elongation: (Break)</b>	Minimum 500% (± 50)	
<b>Basecoat</b>	Minimum 400% (± 50)	
<b>Topcoat</b>	(ASTM D2240)	
<b>Hardness:</b>	65-60 Shore A	
<b>Basecoat</b>	90-95 Shore A	
<b>Topcoat</b>	ASTM D1004)	
<b>Strength:</b>	125 lbs. per inch (±20)	
<b>Basecoat</b>	285 lbs. per inch (±25)	
<b>Topcoat</b>		

## 2.04 SUBSTITUTIONS

Materials such as acrylic coatings, cementitious coatings, ceramic-filled coatings, asphalt modified materials, silicone, kraton-based rubbers, Hypalons and butyls are not considered acceptable substitutes for materials specified herein.

## **PART 3 – EXECUTION**

### 3.01 SURFACE INSPECTION

- A. Roof surfaces shall be clean, dry, structurally sound, stable and well secured.
- B. The roof surface shall be free of excessive ponding water. A roof surface that allows ponding water 48 hours after a rain shall be considered unacceptable. All water shall be allowed positive drainage from the roof.
- C. Inspect condition of flashing details adjacent to protrusions, penetrations, roof mounted equipment, curbs, walls, parapets, drains and roof edge to ensure that details are acceptable and will maintain a weather-tight installation after being properly reinforced and coated.
- D. Determine moisture content of existing concrete deck. A moisture content of 15% or greater indicates a potential problem. Work shall not proceed until the cause of high moisture content is verified and the condition is corrected.

### 3.02 SURFACE PREPARATION

- A. All surfaces shall be clean and dry, and free of any dirt, dust, gravel, oil, surface chemicals or other contaminants that may interfere with optimum adhesion.
- B. Any unsound areas in the roof deck, including deterioration, pitted or spalled concrete, excessive moisture content, etc., shall be repaired or replaced.
- C. Fill any pits or holes in the concrete with **Uni-Crete** or other high strength, polymer concrete repair mix so they are flush with the surrounding substrate. Spalled sections of the concrete should be resurfaced using a slurry-coat of **Uni-Crete**, trowelled smooth over the affected area. **Uni-Crete** can also be used to build up low areas, providing positive slope-to-drain.
- D. All concrete surfaces, whether new or existing, shall be cleaned using **United Cleaning Concentrate (UCC)**. Dilute **UCC** at the rate of 1 part concentrate to 10 parts water. Apply the dilute mixture under low pressure spray at the rate of 200 sq. ft. per gallon (.2 l/m<sup>2</sup>). After allowing to sit for 15 to 20 minutes, rinse thoroughly with fresh water under high pressure (minimum 2,000 psi/13,790 kPa) to remove the solution from the roof. Heavy deposits of dirt or contamination may require agitation with a stiff-bristle broom or similar mechanical scrubber. Allow the roof to dry thoroughly.
- E. Inspect parapets to ensure that concrete, masonry or metal caps are sound. Caulk, reinforce or replace as necessary in order to bring parapet and parapet cap into a weathertight condition.
- F. Concrete that is chalky or "punky" after cleaning shall be primed with one coat of **Uni-Tile Sealer LV**. Reduce the sealer at the rate of 50% to 100% by volume, depending on the porosity of the substrate, using MEK, Xylol or Acetone. Apply diluted **Uni-Tile Sealer LV** at the rate of 250 to 300 sq. ft. per gallon (6.1 to 7.3 m<sup>2</sup>/l) to prime, seal and solidify the surface.
- G. Reinforce all vertical/horizontal interfaces, roof termination points, openings, around the base of all vent pipes and other protrusions, as well as HVAC units and other roof mounted equipment with **Roof Mate Mesh** embedded into **ELASTUFF 101** Light Gray Basecoat. Apply **ELASTUFF 101** liberally around the area to be reinforced with a brush or roller. While the material is still wet, embed a strip of 4" or 6" (10 or 15 cm) **Roof Mate Mesh**, centered over the detail. Work mesh into the **ELASTUFF 101** using a brush or roller to eliminate air pockets, wrinkles and gaps, applying additional material as necessary to totally encapsulate the reinforcing fabric.
- H. Reinforce all "moving" cracks, seams and control joints by first filling the full length and depth with a premium quality, single component urethane construction caulk, tooling as necessary to ensure bonding. After the caulk has dried, applied 1½" bond-breaker tape (such as masking tape), centered over the caulk and extending a minimum of ½" (3 cm) on either side of the crack or control joint. Apply reinforcement over the top of the detail as described above under 3.02G.

### 3.03 ELASTOMERIC COATING APPLICATION

- A. All roof preparation materials shall be allowed to dry thoroughly prior to application of the elastomeric polyurethane coating.
- B. Immediately prior to application of the polyurethane coating system, all dust, dirt and other contaminants shall be blown off the roof surfaces to be coated using high pressure compressed air.
- C. Roof surfaces that exhibit a high degree of spalling and/or cracking can be detailed by embedding **Roof Mate Fabric** over the entire surface. This is accomplished by applying **ELASTUFF 101** at 1.25 to 1.5 gallons per 100 sq. ft. (.5 to .6 l/m<sup>2</sup>) to a 4 to 10 foot (1.2 to 2.5 m) section of roof, slightly wider than the width of the fabric. Roll the **Roof Mate Fabric** into the wet **ELASTUFF 101**, allowing the fabric to conform to the surface contours. Work the fabric with a broom or roller so that it is completely embedded, eliminating any air pockets, wrinkles or gaps. Apply additional **ELASTUFF 101** over the top side at the rate of .5 to .75 gallons per 100 sq. ft. (.2 to .3 l/m<sup>2</sup>) to completely encapsulate the fabric, taking extra care to ensure that edges of the fabric are well saturated and adhered. Overlap consecutive passes of **Roof Mate Fabric** a minimum of 2" (5 cm) on each side. Substrate porosity and texture will determine the amount of **ELASTUFF 101** required to encapsulate the reinforcing fabric. Allow the **ELASTUFF 101** to dry thoroughly prior to applying the polyurethane coating to the roof.

D. The entire roof substrate shall receive **ELASTUFF 101/102** polyurethane elastomer system applied as follows:

*The following is required for issuance of a 5-Year System Warranty:*

1. Apply **ELASTUFF 101** Basecoat at a minimum rate of 1 gallon per 100 sq. ft. (.4 l/m<sup>2</sup>).
2. After allowing the base coat to dry, apply **ELASTUFF 102** White (or other specified color) at a minimum rate of 1.25 gallons per 100 sq. ft. (.5 l/m<sup>2</sup>). Use a medium-nap roller or airless spray to apply the elastomeric coating. Application of the top coat shall be in a perpendicular direction to the base coat.
3. The total – base coat/top coat – minimum dry film thickness required at any location shall be 45 mils (1,143 microns).

*The following is required for issuance of a 10-Year System Warranty:*

1. Apply **ELASTUFF 101** Basecoat at a minimum rate of 1.5 gallons per 100 sq. ft. (.6 l/m<sup>2</sup>).
  2. After allowing the base coat to dry, apply 2 separate coats of **ELASTUFF 102** White (or other specified color) at a minimum rate of 1.0 gallon per 100 sq. ft. (.4 l/m<sup>2</sup>) per coat. Use a medium-nap roller or airless spray to apply the elastomeric coating. Application of the second top coat shall be in a perpendicular direction to the application of the first top coat.
  3. The total – basecoat//top coat – minimum dry film thickness required at any location is 60 mils (1,524 microns).
- F. The **ELASTUFF 101/102** System shall extend up and over the top of all parapets as well as all vent pipes, parapets and other protrusions to terminate a minimum of 3" (8 cm) above the substrate, creating a self-terminating flashing and to provide an aesthetically pleasing appearance.
- G. To provide a non-skid walk path on roofs subject to heavy foot traffic, demarcate walkways by applying an additional coat of **ELASTUFF 102**, using a medium-nap roller or airless spray, at the rate of 1 gallon per 100 sq. ft. (.4 l/m<sup>2</sup>) along the designated traffic area. While the coating is still wet, broadcast 3M #11 ceramic roofing granules to the point of refusal.

### 3.04 CLEANUP

- A. Maintain work and work areas in a clean, safe condition at all times during coating installation. Remove excess materials, trash and debris from the jobsite daily.
- B. At the completion of the project, clean area of any spills and containers, and clean up all roofing debris, leaving jobsite in a clean and orderly condition.

### 3.05 WARRANTY

- A. Upon completion of the roof coating system, the Coating Manufacturer's Representative, Owner's Representative, Architect and Applicator shall make a final inspection to determine the dry film thickness of the fluid-applied polyurethane membrane and to verify that the system meets the Manufacturer's requirements for warranty. The Contractor shall notify all interested parties in advance of said inspection.
- B. As a condition of the project's completion and acceptance, deliver to the Owner a copy of the fully executed, specified warranty from the Coating Manufacturer, following individual warranty guidelines.



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