ELASTUFF 101/102/103

SINGLE-COMPONENT POLYURETHANE COATING SYSTEM

Technical Data & Application Instructions

PRODUCT DESCRIPTION

ELASTUFF 101/102 is a high solids, moisture-catalyzed, single-component polyurethane coating system. The system consists of **ELASTUFF 101,** an aromatic polyurethane basecoat, and **ELASTUFF 102,** a UV-resistant, 100% aliphatic polyurethane topcoat. **ELASTUFF 103**, a low VOC aliphatic topcoat, is also available to meet VOC regulations in specific areas. This combination provides an excellent balance of tensile strength, elongation and hardness, resulting in long term flexibility and impact resistance. High abrasion resistance also offers protection from maintenance traffic and severe weather conditions. Non-migrating fire-retardant chemicals are permanently locked into the coating, ensuring long-term fire retardancy.

The **ELASTUFF 101/102** system is a permanently flexible "breathing" membrane, allowing moisture vapor from within the substrate or building interior to escape though the coating, while remaining impervious to mass water penetration from the exterior.

ELASTUFF 101/102 has been independently tested and certified to exceed ENERGY STAR® guidelines for reflectivity. It also conforms to Cool Roof Rating Council and LEEDS criteria for reflectivity and emissivity.

ELASTUFF 101, **102** and **103** are single-component elastomers, which are catalyzed through exposure to moisture in the air. They are designed for application through standard airless spray equipment, as well as brush or roller.

BASIC USES

The **ELASTUFF 101/102** system is designed for protecting a wide range of substrates from the effects of weathering and moisture intrusion. It is particularly effective as a protective membrane over polyurethane foam on new or existing roofs, and hot or ambient storage tanks. It provides a barrier to the effects of degradation caused by normal weathering, aging and ultraviolet exposure. The **ELASTUFF 101/102** system also achieves excellent adhesion to primed concrete, masonry, metal and wood surfaces. **ELASTUFF 102** or **103** are very effective when used on their own in a wide variety of applications requiring a tough, abrasion resistant membrane.

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TYPICAL PROPERTIES

1. **Solids By Weight:**
   ELASTUFF 101 Basecoat: 82% (±2)
   ELASTUFF 102 Topcoat: 77% (±2)
   ELASTUFF 103 Topcoat: 68% (±2) [ASTM D2369]

2. **Solids By Volume:**
   ELASTUFF 101 Basecoat: 80% (±2)
   ELASTUFF 102 Topcoat: 65% (±2)
   ELASTUFF 103 Topcoat: 58% (±2) [ASTM2697]

3. **Flash Point:**
   Basecoat: 75°F (24°C)
   Topcoat: 75°F (24°C) [ASTM3278] (Seta-Flash)

4. **Dry Time To Walk On:**
   Basecoat: 6-8 hours @ 24 wet mils
   Topcoat: 8-12 hours @ 16 wet mils with booster
   Dry Times at 70°F (21°C), 50% R.H.

5. **Tensile Strength:**
   Basecoat: 1,000 psi (±100)
   Topcoat: 2,500 psi (±200) [ASTM D412]

6. **Elongation:**
   Basecoat: 500% (±50)
   Topcoat: 400% (±50) [ASTM D412]

7. **Tear Strength:**
   Basecoat: 125 lbs. per inch (±20)
   Topcoat: 285 lbs. per inch (±25)
   [ASTM D1004]

8. **Hardness:**
   Basecoat: 65-70 Shore A
   Topcoat: 90-95 Shore A [ASTM D2240]

9. **Abrasion Resistance:**
   Less than 35 milligrams weight loss using CS-17 abrasive wheels and 1000 gram weights after 1000 cycles on Taber Abraser. [ASTM D4060]

10. **Low Temperature Flexibility:**
    Passes 180 degree flex over 1/8" (3 mm) mandrel at -7°F (-22°C), Federal Test Method No. 141a-6221.

11. **Low Temperature Impact Resistance:**
    No surface cracks or breaks when impacted with 130 gram, 1¼" steel ball dropped from a height of 5' at -12°F (-25°C).

12. **Temperature Limits For Normal Service Conditions:**
    Tested from -30°F to 200°F (-34°C to 93°C).

13. **Fire Resistance:**
    UL-790 Class "A" listed system over spray applied polyurethane foam. Consult UL Building Material Directory for specifics.

PHYSICAL PERFORMANCE PROPERTIES & ADVANTAGES

1. **UL-790 Class "A" Systems: ELASTUFF 101/102** is UL-790 Class "A" Classified over spray applied polyurethane foam. Refer to UL Building Materials Directory for foam manufacturers and types, foam thicknesses and densities, inclines and coating requirements of rated roof systems.

2. **Building Code Acceptance:** These UL-790 Class "A" roofing systems are accepted by all major model building code authorities for class "A" construction. The code authorities include the Uniform Building Code (UBC), Building Officials and Code Administrators (BOCA), and Southern Building Code Authority (SBCA).

3. **Resistance to Accelerated Weathering:** Test panels were placed in the QUV Accelerated Weathering Tester. Cycling is set at 4 hours of ultraviolet radiation, during which time temperatures reach approximately 135°F (57°C), and 4 hours with no U.V. radiation. A water bath at the bottom of the unit is maintained at 100°F (38°C) to create a constant high humidity condition. After 3,000 hours of continuous testing, the **ELASTUFF 101/102** system showed no surface checking or cracking, no delamination, no loss of flexibility and no chalking. Tested in accordance with ASTM G53.

4. **Resistance to Freeze-Thaw: ELASTUFF 101/102** test panels were exposed to freeze-thaw cycles under complete immersion in deionized water. Cycles consisted of 16 hours at 0°F (-18°C) and 8 hours at 70°F (21°C). After 4 complete cycles, the physical integrity of the coating remained unaffected. There was no loss of adhesion, and no blistering or softening.

5. **Water Absorption:** 3" (7.5 cm) free film discs were immersed in deionized water at 70°F (21°C). After 7 days immersion, **ELASTUFF 101** showed less than 1% weight gain, while **ELASTUFF 102** and **103** showed less than 2.5% weight gain. No visual effect was observed and all elastomeric properties were retained. Tested in accordance with ASTM D543.

6. **High Temperature Stability:** Tested in thermostatically controlled heat chamber—**ELASTUFF 101/102** will not age harden or slump at temperatures up to 200°F (93°C). ASTM D794.

7. **Resistance to Salt Spray:** Coated polyurethane foam test panels were placed in the Harshaw Salt Spray Cabinet and maintained at a temperature of 95°F (35°C), utilizing a fog solution of not less than 5% sodium chloride by weight. After **500 hours** of continuous testing, the **ELASTUFF 101/102** system had no loss of adhesion, no blistering or softening and no loss of flexibility. ASTM B 117.

8. **Low Temperature Flexibility:** The **ELASTUFF 101/102** system is capable of withstanding 180° bends over a 1/8" (3 mm) mandrel @ -7°F (-22°C). Federal Test Method No. 141 a-6221.

9. **Bond Strength:** Instron Universal Testing Instrument—50 to 60 lbs./sq. inch (.34 to .41 MPa) breaking strength. There was no adhesive failure between the **ELASTUFF 101** coating and the polyurethane foam substrate. **ELASTUFF 101** remained totally bonded to the polyurethane foam under all stress conditions. Breaking point occurred within the polyurethane foam itself. ASTM C297.

10. **Impact Resistance:** Steel Ball Drop Procedure using a 12 ounce (340 gram), 1¾" diameter (4.45 cm) steel ball dropped from a height of 20 ft. (6.1 m) onto 2.7 lb./cu. ft. polyurethane foam coated with the **ELASTUFF 101/102** system. No surface cracks or breaks were observed in the coating. Test is adapted from National Bureau of Standards "Falling Hailstone Test".

11. **Cold Temperature Impact:** Steel Ball Drop Procedure using a 4.6 ounce (130 gram), 1¼" diameter (3.18 cm) steel ball dropped from a height of 5 feet (1.5 m) onto 2.7 lb./cu. ft. polyurethane foam coated with **ELASTUFF101/102.** Temperature of test panels was maintained at -12°F (-25°C). No surface cracks or breaks were observed in the coating. Test is adapted from National Bureau of Standards method.

12. **Ponded Water Adhesion:** A 5" (12.7 cm) high column of water was established over polyurethane foam coated with the **ELASTUFF 101/102** system. After 30 days of continuous testing, the **ELASTUFF 101/102** system had no significant loss of adhesion. No blistering or other deleterious effects were observed. There was no migration of water into the polyurethane foam substrate

FOAM REQUIREMENTS

Polyurethane foam components shall be metered and sprayed in accordance with foam manufacturer's directions and specifications. Polyurethane foam should **not** be sprayed during inclement weather or when the following conditions exist:

1. If surface temperature is above 120°F (49°C) or below 35°F (2°C), or when the dew point is less than 5°F (3°C) above the surface temperature. Temperatures shall be measured with a surface thermometer. For surface temperatures between 35°F and 50°F (2°C and 10°C), special catalyzed foam with short cream time must be used.
2. If surface moisture is present, or where moisture meter readings are in excess of 10% (this may vary slightly depending on geographic location).
3. If wind velocity is above 12 miles (19 km) per hour (unless adequate windscreens are provided).
4. If relative humidity is above 80%.

The finished surface texture of the applied polyurethane foam shall range from a smooth to medium "orange peel" finish. **Surface textures defined as "popcorn" or "tree bark", or surfaces which exhibit crevices, voids or pinholes are not acceptable.** The finished surface shall not have any soft or spongy areas or areas of improperly proportioned material. Polyurethane foam shall be a minimum of 1" (2.5 cm) thickness and 2.5 lbs. (1.1 kg) density.

Foamed-in-place cants and crickets shall be smooth and uniform to allow positive drainage. Filleting of foam to parapet walls, vents, roof mounted equipment, etc., shall provide a smooth transition to the roof deck and be of uniform thickness.

If uncoated polyurethane foam is exposed to ultraviolet light for an extended length of time, a fine powder (oxidation) will form on the surface of the foam. **Applying ELASTUFF 101 within 72 hours of the foam application will eliminate this potential problem.** Not all polyurethane foams have the same ultraviolet stability. Some will require topcoating in less than 72 hours. Should oxidation of the polyurethane foam occur, the foam insulation surface shall be brushed with a stiff bristle broom or mechanically scarified or sanded. A light pass of foam must then be applied to reseal the surface.

PACKAGING, MIXING & STORAGE

ELASTUFF 101, **102** and **103** are single component, ready-to-use materials available in 5-gallon (19 liter) pails and 55-gallon (208 liter) drum. **ELASTUFF 102** & **103** are supplied with a separate booster unit that must be added to ensure proper cure and adhesion.

Thoroughly mix all containers of **ELASTUFF 101**, **102** and **103** with an air-driven power mixer for a minimum of 5 minutes prior to application. Avoid sucking air into the coating while mixing. Once the booster unit is added to the **ELASTUFF 102** or **103** the pot life will be 3 to 5 days depending upon ambient conditions. Previously opened containers, or containers that have been stored for an extended length of time, may develop a skin on top of the coating. This should be removed prior to mixing. Thinning the material is not recommended. Store **ELASTUFF 101**, **102** and **103** components in a dry area between 40°F and 90°F (5°C and 32°C).

COATING APPLICATION

The **ELASTUFF 101/102** system is best suited for application through airless spray equipment. Utilize a pump with a minimum output of 2 gallons (7.6 l) per minute and 2,500 psi (17,241 kPa) pressure capability. A natural bristle brush or a medium nap roller may be utilized for touch-up and edging work, or for small areas that are not practical for spray application.

Polyurethane foam and adjacent surfaces to be coated shall be completely dry, and free of any degraded foam, grease, oil, dirt or other contaminants that will interfere with proper adhesion. Any physical damage to the polyurethane foam shall be repaired before coating application commences.

Each coat of **ELASTUFF 101/102** shall be applied in a direction perpendicular to the previous coat. Edges of flat roof areas shall be precoated in a "picture frame" configuration.

The **ELASTUFF 101/102** system must be applied in two or more separate coats to ensure proper coverage and cure rate, and a pinhole-free continuous film. **ELASTUFF 101 Gray Basecoat must always be applied as the first coat over polyurethane foam. ELASTUFF 102** or **103** Topcoat can be used with or without **ELASTUFF 101** over properly primed wood, metal or concrete. All surfaces must be uniformly coated and free of voids, blisters and pinholes. **ELASTUFF 102** or **103** shall be applied over **ELASTUFF 101** within a 48 hour period following application of the **ELASTUFF 101**.

Successive coats of **ELASTUFF 101** or **102** should be applied as soon as the previous coat has dried sufficiently to allow the applicator to walk on. This can normally be accomplished on the next working day, but in any event before contamination occurs. If contamination in the form of dirt, dust, pollution fallout, etc. does occur on the basecoat surface, it must be pressure washed before an additional coat of **ELASTUFF 101**, **102** or **103** is applied.

The **ELASTUFF 101/102** system should not be applied when the ambient temperature is below 50°F (10°C), or if rain is anticipated within 4 hours of application. Store material for a sufficient length of time in a warm area prior to application to bring material temperature to 70°F (21°C). The sprayability of **ELASTUFF 101**, **102** and **103** will depend on the combination of proper equipment and temperature of the coating at time of application.

ELASTUFF 101 applied at the rate of one gallon per 100 sq. ft. (.4 l/m²) will theoretically yield 12.8 dry mils (325 microns). **ELASTUFF 102** applied at this coverage rate will theoretically yield 10.4 dry mils (264 microns), and **ELASTUFF 103** will theoretically yield 9.3 dry mils (236 microns). The following minimum coverage rates and dry film thickness will qualify for UNITED'S warranty programs:

To qualify for UNITED'S **5-Year Standard Warranty Program, ELASTUFF 101** shall be applied in one or two coats to a minimum total 1¼ gallons per 100 sq. ft. (.5 l/m²). The actual minimum dry film thickness required at any location shall be 14 mils (356 microns). **ELASTUFF 102** or **103** shall be applied in one or two coats to a minimum total of 1¼ gallons per 100 sq. ft. (.5 l/m²). The actual minimum dry film thickness required at any location shall be 10 mils (254 microns). The actual minimum total dry film thickness for the **ELASTUFF 101/102/103** system at any location is 24 mils (610 microns).

To qualify for UNITED'S **10-Year Standard Warranty** or **5-Year System Warranty Programs, ELASTUFF 101** shall be applied in one or two coats to a minimum total of 1½ gallons per 100 sq. ft. (.6 l/m²). The actual minimum dry film thickness required at any location shall be 17 mils (432 microns). **ELASTUFF 102** or **103** shall be applied in one or two coats to a minimum total of 1½ gallons per 100 sq. ft. (.6 l/m²). The actual minimum dry film thickness required at any location shall be 13 mils (330 microns). The actual minimum total dry film thickness for the **ELASTUFF 101/102/103** system at any location is 30 mils (762 microns).

To qualify for UNITED'S **10-Year System Warranty Program, ELASTUFF 101** shall be applied in one or two coats to a minimum total of 2 gallons per 100 sq. ft. (.8 l/m²). The actual minimum dry film thickness required at any location shall be 22 mils (559 microns). **ELASTUFF 102** or **103** shall be applied in two coats to a minimum total of 1¾ gallons per 100 sq. ft. (.7 l/m²). The actual minimum dry film thickness required at any location shall be 16 mils (406 microns). The actual minimum total dry film thickness for the **ELASTUFF 101/102/103** system at any location is 38 mils (965 microns).

The **ELASTUFF 101/102** system shall be extended up and over all polyurethane foam on vent pipes and parapets and extended a minimum of 2" (5 cm) above the foam, creating a self-terminating flashing.

If any form of dirt, sand or pollution fallout is detected on the surface of **ELASTUFF 101** or **ELASTUFF 102**, it is necessary to remove this material before applying an additional coat. Surfaces should be washed using a chemical cleaner only after the **ELASTUFF 101** or **102** film has fully cured. Rinse thoroughly with clean, fresh water to remove all traces of the chemical cleaner, and allow to dry.

As work proceeds, the applicator must check the number of gallons (liters) used compared to area coated. If adequate material has not been used according to UNITED'S warranty requirements or project specifications, adjust accordingly and apply additional material to previously coated area(s).

Clean equipment with MEK or Methylene Chloride. Do not leave Methylene Chloride in fluid hoses or pumps for prolonged periods. It can cause swelling and deterioration of hoses and corrosion in the pump.

COLORS

ELASTUFF 101 is available in standard Light Gray only. **ELASTUFF 102** and **103** are available in standard White, which is certified to meet ENERGY STAR®, Cool Roof Rating Council (CRRC) and LEED reflectance and emissivity criteria, as well as California Title 24 requirements. All other colors are custom matched by UNITED for the specific application. Color chips or samples must be furnished to UNITED for all customer colors.

WARRANTY

UNITED'S Standard Warranty, to the Building Owner, is available for a 5-year or 10-year period at **no cost.** Refer to section entitled Coating Application for minimum dry film thicknesses required to qualify for warranty programs.

System Warranty Programs are also available for 5 and 10-year periods at an additional cost. Consult UNITED'S Warranty Explanation forms or contact UNITED'S Technical Service Department for details.

SHELF LIFE

Shelf life of **ELASTUFF 101**, **102** and **103** components in unopened containers is **6 months** from date of shipment from UNITED'S factory. If shelf life has expired, contact UNITED'S Technical Service Department before attempting to utilize the material.

LIMITATIONS & PRECAUTIONS

ELASTUFF 101, **102** and **103** components are affected by moisture and must be protected from moisture contamination. Keep all containers tightly closed during storage. Containers are factory sealed with an inert gas to prevent contamination. For further storage after opening, containers must be purged with nitrogen gas or dry air and tightly sealed to protect from moisture contamination.

Solvents in **ELASTUFF 101**, **102** and **103** are flammable. Use only in a well ventilated area. Keep away from heat, sparks, open flames or lighted cigarettes. Use explosion-proof application equipment, which has been grounded and bonded.

ELASTUFF 101/102/103 is slippery when wet, as are loose roofing granules. Exercise caution when walking on a roof under these conditions.

Avoid breathing of vapor or spray mist. For exterior applications, approved (MSHA/NIOSH) respirator must be worn by applicator and personnel in vicinity of application. Check filters frequently to ensure proper protection. If used indoors, provide mechanical exhaust ventilation. During indoor spray operations, air line masks or positive pressure hose masks must be worn. Avoid contact with eyes and contact with skin.

Adequate precautions must be taken when applying **ELASTUFF 101/102/103** to occupied buildings to ensure that air conditioners and ventilation units are turned off and covered to prevent solvent vapors from entering the building. Windows should also be kept closed. Signs should be posted around the area to advise building occupants or visitors of the spray activity.

For additional information, refer to OSHA guidelines and **ELASTUFF 101**, **ELASTUFF 102** and/or **ELASTUFF 103** Material Safety Data Sheets.

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