

Installation Guide Specification SPF and Elastomeric Coating



I. GENERAL

1.01 SUMMARY

- A. Provide labor, materials, equipment, and supervision necessary to install NCFI Polyurethanes' Spray-Applied Polyurethane Foam (SPF) and spray-applied elastomeric coating system as outlined in this specification to create a seamless waterproof roofing system.
- B. NCFI's application instructions for each product used are to be considered part of these specifications and should be followed at all times.

1.02 SUBMITTALS

- A. Submit product data sheets and literature verifying fire ratings and physical properties of materials.
- B. Submit material safety data sheets.

1.03 QUALITY ASSURANCE

- A. Supplier Qualifications: The EnduraTech® Premier Roofing System, as supplied by NCFI Polyurethanes, is approved for use on the project.
- B. Applicator Qualifications: The applicator shall be approved by NCFI Polyurethanes to apply the system. Manufacturer's written verification of Tier One applicator approval is required.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Containers and Packaging: Deliver materials in original sealed containers, clearly marked with manufacturer's logo, full product name, and lot number(s).
- B. Storage: Store materials between 40°F and 100°F with careful handling to prevent damage to products. If conditions exceed these ranges, special consideration in storage must be taken. Do not store at high temperatures in direct sunlight.
- C. Protection: Protect all materials from freezing and other damage during transit, handling, storage, and installation.

1.05 PROJECT CONDITIONS

- A. For application details of polyurethane foam, consult the foam manufacturer for recommendations on the proper system to use on project substrate and at expected substrate and ambient temperatures. Do not apply polyurethane foam when wind velocity is above 15 mph unless a wind screen is used.

- B. Do not proceed with application of coating materials when surface or ambient temperature is less than 45°F.
- C. Do not apply materials unless surface to receive polyurethane foam and/or coating is clean and dry.
- D. Install all material in strict accordance with all published safety, weather, or applicable regulations of the manufacturer and/or local, state, and/or federal agencies which have jurisdiction.

1.06 DETAIL WORK

- A. This specification does not extensively outline procedures for preparation and finishing of drains, vents, ducts, flashings, parapet walls, etc. This work should be outlined by the contractor before work commences, and shall be performed observing good trade practices. In most cases, the self- flashing attributes of the SPF will be utilized without the need for additional flashing materials. In any case, the SPF should never be applied in a manner that traps moisture or forces moisture to migrate underneath the system. Any needed sheet metal work shall be in accordance with the latest editions of SMACNA and/or NRCA details.

II. PRODUCTS

2.01 POLYURETHANE FOAM

- A. The foam shall be NCFI Polyurethanes system 10-011.

2.02 SPRAY-APPLIED ELASTOMERIC ACRYLIC OR SILICONE COATING SYSTEM

- A. The coating shall be the spray applied EnduraTech® elastomeric acrylic or silicone coating system, provided or approved for use by NCFI Polyurethanes.
- B. Physical Properties of Cured Coating System:
 1. The coating system shall have good resistance to ponding water.
 2. The coating system shall contain no plasticizers.
 3. The coating system shall contain no migrating fire retardants.
 4. The coating system shall have a Class A fire rating over foam on a noncombustible deck when tested according to the procedures outlined in ASTM E108.
 5. The protective coating system shall also meet the following physical property requirements of Table 1 below:

Table 1. Physical Property Requirements of Protective Coatings		
Property	Results	
	Acrylic ASTM D6083	Silicone ASTM D6694
Tensile Strength, psi	200 min.	150 min.
% Elongation @ Break (73°F)	100 min.	100 min.
Wet adhesion to Specified Substrate	2.0 pli min.	2.0 pli min.
Permeance, perms	50 Max	2.5 min.
Volume Solids % Weight Solids %	> 50 > 65	≥ 57 As reported

2.03 RELATED MATERIALS

- A. Flashing, adhesives, thinners, elastomeric caulking compounds, primers, and similar materials shall be approved by NCFI Polyurethanes. All materials used shall be applied in accordance with its manufacturer's recommendations.

III. EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins and product guide specification instructions.

3.02 EXAMINATION

- A. Inspect surfaces, which will receive SPF to make sure they are clean, smooth, sound, properly prepared, and free of moisture, dirt, debris, or other contamination.
- B. Verify that all roof penetrations, mechanical equipment, cants, edge metal, and other on-roof items are in place and secure.
- C. Verify that all critical areas around the immediate vicinity of the spray area are suitably protected.
- D. Verify all roof drains are clean and in working order.
- E. Verify that all air conditioning and air intake vents are suitably protected or closed.

3.03 PREPARATION

- A. Prior to SPF application, all existing non-embedded gravel surfacing material shall be removed by means of a stiff bristle street broom, powered mechanical sweeper, or vacuuming. All loose dirt and dust remaining after gravel removal must be broomed and/or vacuumed from the roof all blisters, ridges and other imperfections must be secured so that the surface will be clean and dry and a secure base for SPF application.

- B. Existing low areas where water ponds and areas with obviously poor drainage to roof scuppers, drains, or roof edges should be corrected by filling and/or tapering the sprayed foam or by adding drains. To prevent the ponding of water, the entire system must be well sloped into drains. Install additional drains as necessary.
- C. Priming may be required on some substrates. Consult NCFI Polyurethanes for specific recommendations.
- D. Other types of Surfaces: Preparation of surfaces and use of materials may vary substantially with different types of new or existing roofs. Contact NCFI for specific recommendations over other types of surfaces.
- E. Weather Conditions: Foam cannot be applied during periods of precipitation or when precipitation is imminent. The ambient temperature must be above 50°F. Ambient humidity must be monitored before and during the application of foam with a psychrometer. Wet bulb measurements must not exceed the maximums for a given dry bulb measurement as defined by NCFI®'s Applicator Bulletin on Wet Bulb/Dry Bulb Thermometer (see Table 2 below). Wind speeds should not exceed 15 mph. To avoid overspray, wind screens are recommended.

Table 2. Maximum Wet Bulb Readings for Given Dry Bulb Reading (°F)											
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
40	35	50	45½	60	55½	70	65½	80	73½	90	79½
41	36	51	46½	61	56½	71	66½	81	74½	91	80
42	37½	52	47½	62	57½	72	67½	82	75	92	80½
43	38½	53	48½	63	58½	73	68	83	75½	93	81
44	39½	54	49½	64	59½	74	69	84	76	94	81½
45	40½	55	50½	65	60½	75	70	85	77	95	82
46	41½	56	51½	66	61½	76	70½	86	77½	96	82
47	42½	57	52½	67	62½	77	71½	87	78	97	82½
48	43½	58	53½	68	63½	78	72	88	78½	98	82½
49	43½	59	54½	69	64½	79	73	89	79	99	83
										100	83

3.04 APPLICATION

- A. Sprayed Polyurethane Foam:
 - 1. Fill all low areas with SPF as required to achieve proper water drainage. The SPF should be applied in a manner to complement existing drainage and to eliminate the accumulation of water.

2. To all properly prepared surfaces, apply the SPF in pass thicknesses between ½ and 1.5 inch per lift to reach the absolute minimum required thickness listed in Table 3. Total thicknesses may be greater, but not less than specified. Flash passes of less than ½ inch are not acceptable.
3. **SPRAYING FOAM ON COAL TAR ROOFS:** Coal tar used in roofing will soften substantially when heated, even on older roofs. When spraying foam onto coal tar roof surfaces, it's important that heat build-up due to the polyurethane foam reaction exotherm be minimized. Excessive heat build-up could result in delamination between the foam and the existing built-up roof surface or between the built-up roof plies. Therefore, when applying foam to coal tar roofs, spray the first foam pass ½ inch to ¾ inch in thickness and allow the first pass to cool for 15 min. before applying additional foam passes.
4. Extend foam up walls, around pipes, and other projections a minimum of 4 inches. The top edge of the foam shall extend all the way up the parapet wall.
5. In areas where obstacles do not permit normal spray techniques and the application tolerance specified above cannot be met, the contractor shall still apply the specified minimum thickness of foam required by a method that he shall select and is approved by the manufacturer. However, the completed application of foam shall be monolithic with adjacent areas of normal application.
6. Apply foam so that the finished surface is smooth and free of voids, pinholes, and crevices with a maximum allowable roughness defined as "coarse orange peel", "Treebark", or "popcorn" surfaces are not acceptable.
7. The foamed roofs drainage should be checked after a rain for ponding water (½ inch or more of water in a single 100 ft² area). Drainage channels can be cut using a rotary wire brush, or other suitable device, to eliminate standing water. Other sources of standing or steady water, such as air conditioning condensation or cooling tower drippage, must be eliminated from the roof surface by plumbing to drain or other suitable means.

Table 3. Foam Thickness Absolute Minimum Requirements			
Roof Type	Warranty Period		
	10 years	15 years	20 years
New (minimum inches)	1.5	1.5	1.5
Recover (minimum inches)	1	1	1

B. EnduraTech® Coating System:

1. Before the base coat of the EnduraTech system is applied, the installed foam insulation must cure a minimum of 2 hours.
2. The base coat of the EnduraTech coating system shall be applied the same day as the SPF application. In no case shall the coating be applied over UV degraded foam.
3. The EnduraTech coating system shall be sprayed or roller applied in a cross hatch technique without causing runs or puddles.

4. EnduraTech Coating Thicknesses

4.1. **Material Only Warranty:** Table 4 lists and minimum DFT (dry film thickness) coating thicknesses required for the specified material only warranty period.

Table 4. Material Only Coating Thickness Requirements			
Coating Type	Warranty Period		
	10 years	15 years	20 years
Acrylic (min DFT)	30	35	40
Silicone (min DFT)	20	25	30

4.2. **System Warranty:** Table 5 lists minimum DFT coating thicknesses required for the specified system warranty period.

Table 5. System Warranty Coating Thickness Requirements			
Coating Type	Warranty Period		
	10 years	15 years	20 years
Acrylic (min DFT)	30	40	45
Silicone (min DFT)	21	28	36

4.3. **Estimated Application Rates:** Table 6 lists estimated application rates to achieve a specific DFT. These application rates are only estimates based on a “theoretical plus 10%” application rate. Actual application rates will vary depending on the uniformity of coating application, SPF surface texture, wind conditions, miscellaneous losses and other factors. Your usage rate will vary. Consult SPFA’s AY-121 Technical Document “Spray Polyurethane Foam Estimating and Reference Guide” for further information on estimating coating requirements.

Coatings must be applied in multiple passes to achieve full, uniform coverage over the SPF. Maximum per pass application rates for each coating type are listed in Table 6. Allow time to cure between passes. Consult TDS for each coating for specific information.

Table 6. Estimated Coating Application Rates to Achieve Specified DFT (Total Gallons per 100 Ft²)			
Mil Thickness Requirement	Acrylic	Silicone	Silicone High Solids
20		2.0	1.6
21		2.1	1.7
25		2.5	2.0
28		2.8	2.2
30	3.8	3.0	2.3
35	4.4		
36		3.6	2.8
40	5.0		
45	5.7		
Maximum Application Rate Per Coating Pass (gal/100ft²)	1.5	1.5	1.5

5. Granules shall be Number 11 in size, ceramic-coated roofing granules.
6. Coating shall terminate at least 2 inches above or beyond the edge of applied foam in a neat and uniform manner.
7. No coating shall be applied if weather will not allow it to cure prior to exposure to precipitation or freezing temperatures.

3.05 FIELD QUALITY REQUIREMENTS

- A. Manufacturer's Field Services for NCFI Polyurethanes warranted projects: Inspection by NCFI Polyurethanes' representative shall be made to verify the proper installation of the system. Any areas that do not meet the minimum standards for application as specified herein shall be corrected at the contractor's expense. Manufacturer's inspection or verification shall not constitute acceptance of responsibility for any improper application of material.

3.06 CLEANING

- A. Surfaces not intended to receive SPF and/or elastomeric coating materials shall be protected during the application of the system. Should this protection not be effective, or not be provided, the respective surfaces shall be restored to their proper conditions by cleaning, repairing or replacing. All debris from completion of work shall be completely removed from the project site.

IV. MATERIALS

The following materials listed in these recommendations are available from NCFI Polyurethanes:

1. EnduraTech® acrylic high performance elastomeric roof coating.
2. EnduraTech® regular and high solids silicone roof coating.
3. Acrylic primer.
4. NCFI Polyurethanes EnduraTech® 10-011 approved premium quality, high density spray polyurethane foam.