



Standard Guide for the Repair and Recoat of Sprayed Polyurethane Foam Roofing Systems¹

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1. Scope

1.1 This specification guide covers the procedures for the repair and recoating of existing sprayed polyurethane roofing systems.

1.2 S.I. units are used throughout the document. Inch/pound units are in parentheses.

1.3 *This standard does not address all of the safety concerns associated with its application or use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

C 1029 Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation²

D 5469 Guide for the Application of New Spray Applied Polyurethane Foam and Coated Roofing Systems³

D 6083 Specification for Liquid Applied Acrylic Coating Used In Roofing³

2.2 SPFA Standards:

AY 102 A Guide for Selection of Elastomeric Protective Coatings Over Sprayed Polyurethane Foam⁴

AY 107 Spray Polyurethane Foam Blisters, Their Causes, Types, Prevention and Repair⁴

2.3 API Standard:

Alliance for The Polyurethane Industry (API), Bulletin AX 119, Guide for Safe Handling and Use of Polyurethane and Polyisocyanurate Foam Systems⁵

3. Terminology

3.1 Definitions:

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² *Annual Book of ASTM Standards*, Vol 04.06.

³ *Annual Book of ASTM Standards*, Vol 04.04.

⁴ Available from Spray Polyurethane Foam Alliance, 1300 Wilson Blvd., Suite 800, Arlington, VA 22209.

⁵ Available from The Alliance for the Polyurethane Industry, 1300 Wilson Blvd., Suite 800, Arlington, VA 22209.

3.1.1 *recoat*—to apply a new protective coating over an existing coated SPF (spray polyurethane foam) roof system to extend the performance life of the roofing system.

3.1.2 *scarfing*—to shave or grind an SPF foam surface mechanically to remove a coating, or UV deteriorated SPF, or both, to refoam or recoat the surface.

4. Significance and Use

4.1 This guide outlines general procedures and precautions necessary for correct and safe repair and recoat of SPF roofing systems.

4.2 This guide is not all inclusive; this guide is intended to supplement detailed instructions from manufacturers and safety requirements required by law.

5. Roof Inspection Procedures and Considerations

5.1 General Considerations:

5.1.1 The performance of a sprayed-in-place polyurethane foam roof system can be affected by all the component parts of the roof structure, as well as the atmospheric conditions inside and outside the structure. Structural design, code compliance, specification review, contractor, and material selection should be considered in the repair and recoat of a spray polyurethane foam roof system.

5.1.2 A range of spray polyurethane foam systems exists with various physical properties, exhibiting different temperature limitations, and different combustibility characteristics. Most published data are obtained from testing of laboratory samples. The thickness of the polyurethane foam sprayed, number of passes, temperature of substrate, ambient temperature, and so forth will have an effect on all polyurethane foam properties.

5.1.3 The specifier should consult with the respective material manufacturer of the sprayed-in-place polyurethane foam roof system. This should include, but not be limited to, materials selection, expansion joints, flashing details, and other items.

5.2 Inspection:

5.2.1 The preparation for the repair and recoat of a sprayed-in-place polyurethane foam roof system will vary according to the conditions of the roof and its component parts and the type of existing protective coating used over the polyurethane foam.

5.2.2 Conduct a roof inspection to determine the repairs to be performed and the type of materials to be used.

5.3 Visual Inspection:

5.3.1 Look for blisters or delaminated areas in the original roof.

5.3.2 Check the condition of the roofing system at all flashing and termination points.

5.3.3 Look for damage that would affect recoating of the roofing system.

5.3.4 Check for pinholes in the polyurethane foam, or coating, or both.

5.3.5 Check for exposed polyurethane foam and areas of eroded coating.

5.3.6 Check for areas of ponding water.

5.4 Physical Inspection:

5.4.1 Perform a nondestructive moisture survey. Follow up suspected moisture-laden areas with a moisture probe or core samples.

5.4.2 Take slit samples of the existing system as required by the new coating manufacturer.

5.4.3 Take polyurethane foam core samples as required by the SPF, or coating manufacturer, or both.

5.5 Analyze Inspection:

5.5.1 Core and slit samples should be examined for the following characteristics:

5.5.1.1 Adhesion of polyurethane foam to the substrate,

5.5.1.2 Interlaminar adhesion of polyurethane foam,

5.5.1.3 Presence of moisture,

5.5.1.4 Adhesion of base coat to polyurethane foam,

5.5.1.5 Adhesion of top coat to base coat,

5.5.1.6 Type and condition of protective coating, and

5.5.1.7 Thickness of protective coating.

5.5.2 On a roof sketch, indicate the following items and deficiencies:

5.5.2.1 Location of core and slit samples,

5.5.2.2 Areas of pinholes,

5.5.2.3 Uncured coating,

5.5.2.4 Polyurethane foam or coating blisters,

5.5.2.5 Mechanical damage,

5.5.2.6 Poor drainage,

5.5.2.7 Repairs required for foamstops, parapet walls, gutters, scuppers, edge-termination details, expansion joints, counterflashing, and other perimeter items,

5.5.2.8 Repairs required to soil and vent pipes, drains, roof hatches, equipment curbs or supports, guy wires, hot stacks, skylights, mechanical units, walkways, sleepers, pitch-pans, and other penetration items,

5.5.2.9 Water-saturated subroofs, insulation, or polyurethane foam,

5.5.2.10 Subroof damage or deterioration, and

5.5.2.11 Areas of special consideration.

6. Selection of Primer

6.1 A primer may be required to enhance adhesion of the new coating to the existing coating. The recommendations of the new coating manufacturer shall be used to determine primer requirements.

7. Selection of Protective Coatings

7.1 The following must be taken into consideration when choosing a recoating material:

7.1.1 Perm rating required according to the vapor drive potential,

7.1.2 Compatibility with the existing roof coating,

7.1.3 Specifier's, or manufacturer's, recommendations, or both,

7.1.4 Environmental conditions,

7.1.5 Slope limitations, and

7.1.6 Anticipated mechanical abuse.

7.2 Refer to SPFA AY 102 and Specification D 6083 for information on protective coatings used over SPF roofing systems.

8. Selection of the Polyurethane Foam System

8.1 New applied spray polyurethane foam must be compatible with the existing system and comply with polyurethane foam Type III or IV, as defined in Specification C 1029.

9. Execution

9.1 General:

9.1.1 The polyurethane foam and coating shall be applied in compliance with Guide D 5469.

9.2 Surface Preparation and Repair:

9.2.1 From the inspection, list items that need correction.

9.2.2 Determine if a primer is required (see Section 5).

9.2.3 Remove or repair unacceptable substrate.

9.2.4 Remove and replace blistered polyurethane, following the procedure outlined in SPFA AY 107.

9.2.5 Remove unacceptable coating. Consult the coating manufacturer for recommended removal method.

9.2.6 Apply coating at recommended thickness to repaired areas. Two or more coats should be used. The final dry mil thickness of repaired areas should be specified.

9.2.7 Small (less than 200-mm [4-in.]) blisters, cracks, breaks in the foam or coating, bird pecks, or hail damage can be repaired with a compatible sealant when the sealant is:

9.2.7.1 Not installed in a greater area or thickness than is recommended by the manufacturer for proper cure,

9.2.7.2 Installed so as to ensure the final surface is higher than the surrounding area so that water will not remain on the repair area, and

9.2.7.3 The type of sealant recommended by the coating manufacturer.

9.2.8 The area to be repaired should be significantly clean and the edges beveled to assure proper adhesion.

9.2.9 In some cases, foam-core plugs can be used with sealant to make small repairs. Foam-core plugs must be of the same density as the foam they are replacing.

9.2.10 If weathering has caused the surface of the coating and the foam to degrade (pitting), such a surface should be scarfed to expose clean, dry polyurethane foam.

9.2.11 To eliminate ponding:

9.2.11.1 Install additional roof drains or scuppers.

9.2.11.2 Build up low areas by applying polyurethane foam. Follow the manufacturer's recommendation for surface preparation.

9.2.12 Repair or replace deteriorated flashing, roof jacks, metal work, curbs, supports, penetrations, drains, and so forth.

9.2.13 Clean the existing coated roof surface of contaminants that could affect adhesion by power washing, brooming, scarfing, or blowing, or both, as recommended by the coating manufacturer.

9.3 Protective Coating Application:

9.3.1 General Coating Requirements:

9.3.1.1 The existing coating and repaired polyurethane foam shall be free of contaminants that could affect adhesion and UV degradation.

9.3.1.2 The texture of the foam will influence the amount of coating material required.

9.3.1.3 Apply one or more applications of the coating over the entire SPF roof system at a uniform rate so as to obtain the minimum dry-film thickness specified by the coating manufacturer.

9.3.2 Inspection:

9.3.2.1 The coating shall be allowed to cure and be inspected for pinholes, thinly coated areas, uncured areas, or other defects. Any defects should be repaired before subsequent applications. The base coat shall be free of contaminants that could affect adhesion before application of the topcoat.

9.3.2.2 Subsequent coating, if required, should be applied in a timely manner to ensure proper adhesion between coats.

9.4 Granule Application (Optional):

9.4.1 Shall be of the size and type and applied in the topcoat as recommended by the coating manufacturer.

9.5 Walkways:

9.5.1 Walkways may be installed for heavy traffic areas and around frequently serviced roof top units. Breathable walk pads should be used as recommended by the coating manufacturer.

10. Safety Requirements

10.1 All handling, storage, applications, and end-use safety precautions shall be as outlined by the material manufacturers and API AX 119.

10.2 Refer to appropriate materials safety data sheets (MSDS) for additional safety information. (**Warning**—Before starting to apply spray polyurethane foam or coating, all HVAC equipment on the roof must be turned off. These units and any other potential sources of air entry into the building must be sealed.)

10.3 Conform to local codes and ordinances.

11. Keywords

11.1 polyurethane foam; repair and recoat; roofing systems; SPF

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