



POLYURETHANE FOAM SAMPLE DESIGN GUIDELINES

URETHANE



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POLYURETHANE FOAM/COATING SAMPLE DESIGN GUIDELINES - URETHANE

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This guideline includes the installation of the liquid applied urethane coating to repair, restore or maintain aged or new sprayed-in-place polyurethane foam systems.
- B. Work included is labor, materials, equipment and accessories and related services to complete the application in accordance with guidelines and details as approved by ITW POLYMERS SEALANTS NORTH AMERICA.
- C. Work excluded is replacement of roof accessories such as drains, vents and other penetrations and structural roof repair.

1.02 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ITW POLYMERS SEALANTS NORTH AMERICA, Inc. will furnish upon request, certification the material meets the physical properties stated in this guideline.
- B. Contractor Qualifications: All work to be completed must be done by an ITW POLYMERS SEALANTS NORTH AMERICA preferred applicator.
- C. No deviation from this guideline will be accepted without prior written approval of ITW POLYMERS SEALANTS NORTH AMERICA.

1.03 SUBMITTALS

- A. Warranty pre-installation notifications are required prior to the installation of the warranted systems.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver material in original, unopened packages and containers.
- B. Containers are to be labeled with manufacturer's name, product name, description, and identification.
- C. Store materials in a dry area above 40°F (4.45°C) and less than 80°F (7.2°C) and protect from water and direct sunlight.
- D. Any materials damaged in handling or storage must not be used.
- E. Deliver SDS for each product. Consult SDS and Technical Data Sheet for each product used before beginning work.

1.05 JOB CONDITIONS (CAUTIONS AND WARNINGS)

- A. All mechanical equipment, vents, skylights, etc., should be in place before the roofing system is installed.
- B. Mechanical units (blowers, HVAC) should be prevented from distributing solvent fumes into the building.
- C. Coatings should be protected from traffic and other abuse until completely cured and installation is complete.

- D. Application of coatings with spray equipment may require some masking and possible erection of wind screens to prevent over-spray and drift damage. Protect surfaces of unrelated areas from coatings and over-spray possibility.
- E. Application shall proceed to dry, clean surfaces only. In planning work consider environment and weather related conditions such as frost, mist, dew, condensation, humidity, and temperature. Temperature should be above 40°F (4.45°C), more than 5°F above the dew point and rising, for best application results.
- F. Sufficient safety belts and lines should be provided. A wet surface or a surface that is not thoroughly cured can be very slippery. All work environments should comply with current OSHA regulations.

1.06 WARRANTY

- A. ITW POLYMERS SEALANTS NORTH AMERICA warrants that materials provided are free from defects in manufacturing and will replace any material found to be defective.
- B. ITW POLYMERS SEALANTS NORTH AMERICA/Contractor Coating System Warranty is available through preferred contractors and at a cost. Consult ITW POLYMERS SEALANTS NORTH AMERICA for further details of the Warranty Program.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The components of the coating system are to be products of ITW POLYMERS SEALANTS NORTH AMERICA or products approved by ITW POLYMERS SEALANTS NORTH AMERICA as compatible; or approved equal.

2.02 POLYURETHANE FOAM

- A. The polyurethane foam to be applied shall be a two-component spray-in-place system made by combining an isocyanate (A) component with a polyol (B) component and shall possess the following physical characteristics: See Associated Data Sheets
- B. Fire Safety Requirements: See SPI Bulletin AX-119. *"MDI-Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal."*

2.03 ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT (Gray)

- A. See Technical Data Sheet

2.04 ERSYSTEMS® POLYURETHANE 300 ALIPHATIC FINISH (White)

- A. See Technical Data Sheet

2.05 ERSYSTEMS® FINISH COAT ALUMINUM

- A. See Technical Data Sheet

2.06 FABRIC REINFORCEMENT: TIE-TEX T272 POLYESTER KNIT FABRIC

- A. See Technical Data Sheet

2.07 RELATED MATERIALS

- A. Gap/Joint Sealant: **PERMATHANE® SM7108**
- B. Metal Primer: **ERSYSTEMS® POLYURETHANE METAL RUST PRIMER.**
- C. Roofing Granules – No. 11
- D. **ERSYSTEMS® QUICKET:** Pourable self-leveling repair sealant. Quickly builds cricket and a pourable sealer.

NOTE: See Technical Data Sheet for additional information and detailed instruction on each product.

PART 3 - APPLICATION

3.01 SUBSTRATE INSPECTION

Roof inspections on a roof diagram indicate the various items and deficiencies identified by inspection.

A. Visual Inspection:

1. Identify blisters, areas of delamination, splits, cracks, and pinholes in the original foam and coating system.
2. Identify areas of ponding water, exposed foam and thin coating.
3. Check for condition of flashings, termination points, expansion joints, areas damaged by hail, foot traffic or other abuse.

B. Physical Inspection:

1. Perform non-destructive moisture survey. Follow up with core samples of suspected wet areas.
2. Probe to determine foam thickness and take slit samples of the system to ascertain:
 - a. adhesion of the foam to the substrate.
 - b. interlaminar adhesion of the foam.
 - c. moisture in the foam.
 - d. type and condition of elastomeric coating.
 - e. adhesion of coating to foam and intercoats.
 - f. thickness of elastomeric coating.

3.02 FOAM/COATING SURFACE PREPPERARION

A. Blister repair - determine cause and extent of blistering.

1. If a number of blisters are clustered remove the entire top pass of the area rather than treating individually.
2. Surface area adjacent to the cut should be cleaned. After opening, low foam layers should be inspected for moisture. Cut out the blister until all loose material is removed and a tight edge is determined. Cut at a 45° angle, sloping inward.
3. Large blisters (more than 4" in diameter and 1" in depth).
 - a. Spray Foam into the void to a level slightly above original roof level.
 - b. Apply: **ERSYSTEMS® POLYURETHANE 300 FINISH COAT** to the thickness specified for appropriate base coat.
4. Small blisters cracks, breaks and other small defects.
 - a. Fill the void area with caulk of the chemistry of the coating selected. Fill to a level

slightly above original roof level and feather the edge of the caulk.

- b. Apply: **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** to the thickness specified for appropriate base coat.

B. Ponding

1. Install additional drains or scuppers.
2. Build up low areas by applying additional foam. (After cleaning and priming - Section 3.02D).

C. Exposed Foam

1. If sufficient foam depth remains under exposed foam the surface may be scarified or ground to a level of solid, clean, dry foam. Scarifying a top layer provides visibility of all moist areas.
2. Scarifying foam will be primed with a “Foam Primer” prior to applying additional Foam.

D. Hail Damage

1. If a number of hail hits are clustered remove the entire top pass of the area rather than treating individually.
2. Surface area adjacent to the hail damage should be cleaned. Inspect area for moisture and cut out any saturated foam.
3. Cut out any burned foam until solid, clean, dry foam is reached.
4. Large hail hits
 - a. Spray Foam into the void to a level slightly above the original roof level.
 - b. Apply: **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** to the thickness specified for appropriate base coat.
5. Small hail hits.
 - a. Fill the void area and seal all cuts and cracks with caulk of the chemistry of the coating selected. Fill to a level slightly above original roof level and feather the edge of the caulk ensuring that the caulk is level to the original roof.
 - b. Apply: **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** to the thickness specified for appropriate base coat.

E. Cleaning aged foam

Existing coating may be power washed, power “scrubbed” or “broomed” with low pressure water to remove dust, dirt, mildew and other contaminants.

- E. Surface shall be smooth, clean, dry, sloped to drain, and prepared for coating application.
- F. Adhesion check of Base Coat, with and without primer, shall be applied to clean prepared surface.

3.03 DRAINAGE

- A. Areas exhibiting a lack of positive drainage or ponding water will adversely affect performance of any roofing system and will be excluded from warranty. Where positive drainage does not exist, water removal from the roof surface must be facilitated by lowering drains and/or taking other corrective action. Additional maintenance inspections, repair work, the addition or use of primers and/or higher system mil-build may be required in these areas to extend coating life.

3.04 COATING APPLICATIONS:

A. Coating Application-Urethane Coating: (Note: Total dry mil minimums not acceptable uniformly over entire field)

1. The foam surface shall be free of moisture, frost, dust, debris, oils, tars, grease or other contaminants, which may impair adhesion of the coating to the foam. The surface shall be clean, dry, sound, smooth and free of voids, pinholes or blisters. Any damage or defects to the foam shall be repaired prior to coating application, with foam or PERMATHANE® SM7108 urethane sealant.
2. The foam shall be allowed to cure a minimum of 2 hours. **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** shall be applied the same day as the foam application when possible. If more than 24 hours elapse prior to applying the: **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** the foam shall be inspected for UV degradation.
3. At roof penetrations, all vertical transitions, and at the roof perimeter an additional application of: **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** shall be made. Open cells in the foam created by planing, filing or grinding shall be completely filled. Back rolling the: **ERSYSTEMS® POLYURETHANE 300 AROMATIC BASE COAT** will help eliminate pinholes. Additional base coat shall extend down into drains and scuppers to thoroughly coat the area. Coating shall terminate neatly a minimum of 3-4 inches above/beyond spray foam terminations.

B. **ERSYSTEMS® POLYURETHANE 300 ALIPHATIC COAT (White)**

BASE COAT: POLYURETHANE 300 AROMATIC BASE COAT is applied to the properly prepared surface at the rate of approximately 2 gallons (7.57 liters) per 100 square feet in 2 passes, allow for a 12-16 hour cure between passes. Rough and irregular surfaces may require a heavier application. The POLYURETHANE 300 AROMATIC BASE Coat can be spray or roller applied in 1 pass at a minimum of 1 gallon (3.79 liters) per pass. Back rolling will assist in acquiring a uniform membrane thickness. If foam surface texture is beyond “orange peel”, more coating will be required to get uniform thickness applied. Initial cure of POLYURETHANE 300 AROMATIC BASE COAT will be 12-24 hours. The base coat shall be thoroughly inspected for pinholes, defects, voids, and thinly coated areas prior to applying finish coat.

FINISH COAT: After allowing the POLYURETHANE 300 AROMATIC BASE COAT, a finish coat of POLYURETHANE 300 ALIPHATIC FINISH COAT is applied to the properly prepared surface at the rate of approximately 1 gallon (3.79 liters) per 100 square feet in 1 pass (total dry mil 30, minimum 28). Finish coat may be spray applied or rolled on perpendicular to the base coat application. If surface texture is beyond “orange peel”, back rolling and/or multiple coats may be required to achieve thickness uniformity. Finish coat thickness shall be determined by slit samples and QC procedure. 8 - 12 hours cure time is required prior to re-coat.

C. Option B – FINISH COAT ALUMINUM:

BASE COAT: POLYURETHANE 300 AROMATIC BASE COAT is applied to the properly prepared surface at the rate of approximately 1.0 gallon (3.79 liters) per 100 square feet. Rough and irregular surfaces may require a heavier application. The POLYURETHANE 300 AROMATIC BASE COAT can be spray or roller applied in 1 pass at 1.0 gallon (3.79 liters) per 100 square feet per pass. Back rolling will assist in acquiring a uniform membrane thickness. If foam surface texture is beyond “orange peel”, more coating will be required to get uniform thickness applied. Initial cure of POLYURETHANE 300 AROMATIC BASE COAT will be 12-24 hours. The base coat shall be thoroughly inspected for pinholes, defects, voids, and thinly coated areas prior to applying finish coat.

FINISH COAT: After allowing the POLYURETHANE 300 AROMATIC BASE COAT to cure, a finish coat of FINISH COAT ALUMINUM is applied at the rate of 2.0 gallons (7.57 liters) per 100 square feet in 2 passes (total dry mil 34, minimum 32). Finish coat may be spray applied or rolled on perpendicular to the base coat application. If surface texture is beyond “orange peel”, back rolling and/or multiple coats may be required to achieve thickness uniformity. Finish coat thickness shall be determined by slit samples and QC procedure. 8 - 12 hours cure time is required prior to re-coat.

- C. Granule application - Roofing granules shall be applied into a tack coat of Finish Coat. 35 - 40 pounds of No. 11 Roofing granules shall be immediately embedded into 0.5 - .75 gallons (1.89 – 2.84 liters) per 100 square feet of Finish Coat. Granule application should occur within 2 to 3 minutes of coating application and should be evenly distributed over the horizontal surface. Excess granules may be removed after the system has cured.

D. Re-Coating Polyurethane Foam Insulation – See Restoration of Polyurethane Foam Insulation & Coating Guideline for details.**1. Surface must be cleaned.**

- Surface may be power washed at 2000 psi to remove dirt and any other contaminants which may impair the bond of the coating.
- Cleaning may be done with low pressure and low volume water with power floor-type scrubbers or with medium bristle broom as an alternative.
- Surface must be well rinsed, clean and dry prior to coating.

2. Adhesion tests are required for every re-coat application prior to making coating decisions.**3. Coating - follow coatings guidelines of 3.02 A 1-3 above. Varying amounts of coating may be specified depending on condition of the original system.**

- E. Consult ITW POLYMERS SEALANTS NORTH AMERICA Technical Department for warranty requirements.

PROTECTION AND CLEAN-UP

PROTECTION

- A. The roof system and all components must be protected from all other trades at the job site.
- B. All damage to the system must be repaired to comply with ITW POLYMERS SEALANTS NORTH AMERICA guidelines prior to final inspection for warranty approval. The cost of all related repairs will be borne by the trades and/or subcontractors responsible for the damages.

CLEAN-UP

- A. Site clean-up is the responsibility of the contractor.
- B. All debris, containers, materials, equipment, and protection materials must be removed from the premises and properly disposed of. All work and storage areas must be in an undamaged and acceptable condition upon completion of clean-up.