



## Metal Roof Restoration Sample Design Guideline

# POLYURETHANE 300

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## METAL ROOF RESTORATION SYSTEMS SAMPLE DESIGN GUIDELINES - URETHANE SYSTEM

### **PART 1 – GENERAL**

#### **1.01 DESCRIPTION**

- A. This guideline includes the installation of fluid applied urethane roof coating to rustproof, restore, and waterproof metal roofs. The three-step process effectively protects the metal, seals seams & fasteners and renews the metal surface to extend the useful life of the roof. The system shall include waterproofing all metal roof panels, flashings, valleys, ridges, joints and junctions integrally related to the roof.
- 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, INC.
- C. Work excluded is replacement of roof accessories such as gutters, drains, vents and other penetrations including 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, INC.

#### **1.03 SUBMITTALS**

- A. A warranty pre-notification form is 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 below 80°F (26.7°C) 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 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 45°F (7.2°C), rising, and stay above 40°F (4.45°C) long enough for initial cure to occur. Moisture should not be imminent.
- 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, INC. warrants that materials provided are free from defects in manufacturing. ITW POLYMERS SEALANTS NORTH AMERICA, INC. will replace any material found to be defective.
- B. ITW POLYMERS SEALANTS NORTH AMERICA, INC. /Contractor Coating System Warranty is available through preferred contractors and at a cost. Consult ITW POLYMERS SEALANTS NORTH AMERICA, INC. for further details of the Coating System 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 ERSYSTEMS® POLYURETHANE METAL RUST PRIMER**

- A. See Technical Data Sheet

### **2.03 ERSYSTEMS® H.E.R.**

- A. Polyurethane sealer for seams, fasteners, penetrations
- B. See Technical Data Sheet

### **2.04 BASECOAT - ERSYSTEMS® POLYURETHANE 300 AROMATIC BASECOAT (Gray)**

- A. See Technical Data Sheet

### **2.05 FINISH COAT - ERSYSTEMS® POLYURETHANE 300 ALIPHATIC FINISH COAT (White)**

- A. See Technical Data Sheet

## 2.06 RELATED MATERIALS

- A. Gap/Joint Sealant: **PERMATHANE® SM7120 PU**
- B. Gap/Joint Fabric: **TIE-TEX 272** Polyester Knit Fabric
- C. Fasteners: Self Drilling & Self Tapping Metal
- D. **ERSYSTEMS® QUICKET**: 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

- A. A proper substrate shall be provided to receive ERSystems® coatings. Metal surfaces must be clean, dry, and free of loose debris. Adhesion test of coating to the metal roof substrate is required where the bond to the metal may be questionable; such as with Kynar® 500 based finishes.

### 3.02 SURFACE PREPARATION

- A. Walk the roof deck and tighten all loose fasteners. Replace missing fasteners and all fasteners that are stripped with oversized fasteners.
- B. Metal panels which no longer have integrity due to excessive rust and deterioration must be replaced.
- C. Panels with seam gaps of 1/8" or more must be stitched as tight as possible with additional screws. Any horizontal seams where the purlin screws are more than 2" from the overlap must be stitched tight at the seam with a minimum of 6 per 3' panel. Light gauge metal panels may flex open at the horizontal lap seam when walked on. Additional stitch screws and/or fabric reinforcement may be required in the pan of the panel to reduce deflection. PERMATHANE® SM7120 PU (Polyurethane Sealant) may be used to seal gaps prior to stitching metal with appropriate fasteners.

### 3.03 CLEANING

- A. Prepare the roof surface by high pressure washing, rinse well and let dry. Use a tri-sodium phosphate (TSP) solution if the metal surface is especially dirty, oily, etc. Water pressure of 2,000 psi to 3,000 psi will be required to remove loose rust, dirt, paint and miscellaneous soils.
- B. Galvanized metal surfaces may require an acid etch to remove debris, which may interfere with proper bonding. The dilute acid solution must be thoroughly rinsed from the roof.
- C. If rust is a hard scale, it may require power brushing to remove and get down to a sound substrate.
- D. If silicone products have been used in attempts at waterproofing, they must be removed prior to coating applications.
- E. If asphalt based roof coatings have been previously used to repair roof seams and fastener heads, do not apply solvents to clean these areas. Remove asphalt coating with power washing, scraping or brushing.

- F. After pressure washing and cleaning, remove all loose coating, scale and other foreign matter with a putty knife or other appropriate tool. Brush clean and apply coating directly over the tightly bound coating which remains. Let dry completely before proceeding.

### **3.04 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.

### **3.05 PRIMING**

- A. Coat all rusty surfaces with POLYURETHANE METAL RUST PRIMER. Apply POLYURETHANE METAL RUST PRIMER at 0.5 gallon (1.89 liters) per 100 square feet in two passes for modest rust. (total dry mils 4, minimum 3)
- B. Under normal drying conditions, POLYURETHANE METAL RUST PRIMER may be re-coated within 1 to 2 hours.

### **3.06 SEAMS, FASTENERS & PENETRATIONS**

- A. Waterproof seams: Apply H.E.R. by pumping a bead 1" to 1.5" wide into place along the vertical seam. Fill the underside of the seam with H.E.R. by brushing perpendicular to the seam with a 3" wide brush and then feather the H.E.R. to a 3" width along the seam. H.E.R. shall be approximately 60 wet mils (1/16") thick directly over the area of the seam. Horizontal seams are sealed in the same manner as vertical seams. Two coats may be required in some areas to achieve DMT specified. Horizontal seams may be reinforced with polyester fabric embedded into the H.E.R. at areas where excessive movement of the panels is known to exist or where gaps between the panels exist even after additional fasteners are added.
- B. Fasteners: H.E.R. shall be applied at 60 wet mils over all fastener heads, extending 1.5" in all directions around the fastener head.
- C. Penetrations & Flashings: Seal with H.E.R. by applying a 60 wet mils thickness for 3" to 4" around the base of the penetration. Polyester fabric may be embedded in the H.E.R. to bridge gaps and reinforce the membrane.
- D. Gutters & valleys: Seal with H.E.R. by applying a 60 wet mils thickness over the area to be sealed and for 3"-4" up and beyond the area to be sealed. If necessary embed polyester fabric of the appropriate width, and brush or roll additional H.E.R. over the fabric, making certain all wrinkles are rolled out of the fabric. Let H.E.R. cure for 24 hours prior to applying Finish Coat.
- E. Skylights: Edges shall be sealed with H.E.R. as described above.
- F. Typical roofs will require .4 to .5 gallons (1.51 to 1.89 liters) per 100 square feet of H.E.R. to complete the waterproofing of seams and fasteners. Waterproofing penetrations,

valleys and repair areas will require additional H.E.R.. Application of 60 wet mils requires approximately 4 gallons (15.14 liters) per 100 square feet.

- G. Inspection of all H.E.R. application should be done to assure that work is satisfactory and complete, and that the sealing of gaps and bolt heads has been accomplished.
- H.E.R. over seams, fasteners and penetrations and repair areas shall be 50 dry mils minimum.
  - The roof is watertight at this point.

### **3.07 FINISH COAT: (Note: Total dry mil minimums not acceptable uniformly over entire field)**

- A. Option A – POLYURETHANE 300 ALIPHATIC FINISH COAT:

Apply POLYURETHANE 300 AROMATIC BASECOAT (Gray) at 1.0 gallon (3.79 liters) per 100 square feet, allow to cure.

After a 12-16 hour cure of the POLYURETHANE 300 AROMATIC BASECOAT apply POLYURETHANE 300 ALIPHATIC FINISH COAT at 100 square feet per gallon (3.79 liters). (total dry mil: 25, minimum 23).

- B. Initial cure of Finish Coat will typically be 6 to 12 hours, the time required between coats.
- A. 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 POLYURETHANE 300 ALIPHATIC 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. Contact ITW POLYMERS SEALANTS NORTH AMERICA, INC. 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.