

Fully Reinforced Silicone Roof System

Part 1. General Conditions

1.1 Description

- A. Scope of Work Provide all materials, labor and equipment required for the installation of the new Fully Reinforced Roof System.
- B. Related Work
 - 1. Repair All Sheet Metal Defects
 - 2. Install PolyIso Cover Board
 - 3. Install Dens Deck Roof Board
 - 4. Perform Adhesion Tests
 - 5. Install Silicone RCR Membrane and Polyester Fleece Fabric
 - 6. Install Walkway Systems

1.2 Performance Requirements

- A. Conform to applicable code for fire resistance ratings of roof system.
- B. Underwriters Laboratories, Inc. - UL 790: Class A Fire Hazard Classification.
- C. All silicone products must be domestically produced. Products produced outside of the US will not be accepted.
- D. Coating manufacturer must produce its own product. Private labeled silicone coating products will not be accepted.
- E. The RCR silicone coatings discussed in this specification have a moderate rate of water vapor transmission. They are not recommended for use on cold storage or cryogenic structures. Such structures may have constant high water vapor drive causing long-term accumulation of moisture in the insulation/deck. Consult manufacturer for vapor retardant systems to use on refrigerated structures

1.3 Submittals

- A. Product Data: Product data on silicone coating, physical and chemical properties, preparation of substrate required, product limitations, and cautionary requirements.
- B. Safety Data Sheets (SDS)
- C. Shop Drawings: Roof plan and details showing extent of roofing, intersections with adjacent surfaces, and details of expansion joints, counterflashing, and other items for a complete roofing system.
- D. Manufacturer's Installation Instructions: Indicate installation requirements and procedures.
- E. Certificates:
 - 1. Product certificates signed by the manufacturer certifying material is in compliance with the specified performance characteristics and criteria, and physical requirements.
 - 2. Provide a copy of Certified Licensed Applicator (CLA) certificate.
- F. Sample copy of PM warranty

- G. Maintenance Data: For Fully Reinforced Roof System to include in maintenance manuals.
- H. Final Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.4 Quality Assurance

A. Manufacturer:

- 1. Company specializing in the manufacturing of the system specified in this Section.

B. Installer:

- 1. Installer must be a Certified Licensed Applicator (CLA) by the Manufacturer providing the warranty, and capable of receiving the specified warranty.
- 2. CLA to ensure all personnel are properly trained and have a full understanding of all OSHA safety requirements.

1.5 Delivery, Storage, and Handling

- A. Deliver and store liquid materials and other products in their original unopened containers or packaging until ready for installation.
- B. Materials shall be clearly labeled with the manufacturer's name, product identification, safety information, and lot numbers.
- C. Store materials indoors whenever possible.
- D. Protect stored products from freezing.
- E. Comply with the manufacturer's instructions for handling and safety procedures.
- F. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 Environmental Requirements

- A. Maintain logs of environmental conditions (temperature, humidity, and wind speed) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside of manufacturer's limits.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- C. Do not install silicone coating under the following conditions:
 - 1. When ambient temperature is below 35° F.
 - 2. At temperatures less than 5° F above dew point.

1.7 Warranty

- A. Provide Manufacturer's (5, 10, 15 or 20 year) labor & material warranty covering leaks due to silicone material failure.

Part 2. Products

2.1 Acceptable Products

- A. PolyIso cover board
- B. Dens Deck Roof Board

C. Cleaners and Primers

1. Progressive Materials: Consult PM Primer Guide

D. Silicone Caulk Sealant

1. Progressive Materials: SS 300 Series Silicone Sealant

E. Flashing Grade Sealant

1. Progressive Materials: FG 400 Pro Patch

F. Reinforcing Fabric

1. Progressive Materials: PF 200 Polyester Fabric
 - a. PF 206 – 6"
 - b. PF 212 – 12"
 - c. PF 236 – 36"
 - d. PF 240 – 40"

G. Walkway System

1. Progressive Materials: Pro-Grip Walkway System
 - a. PG 700 Pro-Grip Yellow Walkway Coating
 - b. PG 750 Pro-Grip Yellow Walkway Granules

H. Skylight Sealer

1. Progressive Materials: HS 3220 Clear Silicone Skylight Coating

A. Silicone Coating

1. PS 900 Silicone base & intermediate coat

2.2 Silicone Top Coat

A. Silicone base and topcoat to be Pro-EcoSil HS 3200 Series Silicone Coating by Progressive Materials, LLC and complying with the following minimum properties:

1. Tensile Strength: ASTM D412, 247.
2. Elongation: ASTM D412, 237 percent minimum at break at 75° F.
3. Water Vapor Permeance: ASTM D-96, 10.7 at 20 mils.
4. Fire resistance: ASTM E108, UL 790 Class A.
5. Color: Owner to select standard topcoat color.
6. Solids Content: 92% ±3%
7. VOC Content: < 50 grams/liter
8. Initial Solar Reflectivity: .89
9. Initial Thermal Emissivity: .90
10. SRI Value: 113

Part 3. Execution**3.1 Examination**

- A. Verify roof slope prior to beginning installation. There is to be no single area of standing water on the roof 24 hours after a rain, greater than 100 sq. ft. and more than ½" deep.
- B. Identify all deck failures and inadequate sheet metal details.
- C. Inspect all roof drains to ensure proper performance.

- D. For applications over newly poured concrete, the roof must be fully cured for a minimum of 60 days prior to coating application.
1. Dens Deck Roof Board is not required for applications over concrete.
 2. Applications over un-aged concrete (less than a year old) do require P-140 2-Part Epoxy Primer to promote adhesion.

3.2 Preparation

A. Concrete

1. Cleaning
 - a. Thoroughly power wash roof surface and all other areas to receive new coating with a minimum of 2,000 psi water pressure.
 - b. After the surface has fully dried, install P-140 two-part epoxy primer at a rate determined in the Technical Product Data sheet, under "coverage guide".
 - c. Any areas of grease contamination are to be cleaned with an industrial strength detergent.
 - d. Any loose roofing or mastic materials must be removed.
2. Roof Penetration and Flashing Details
 - a. Ensure all roof penetrations and flashings provide a watertight condition. Re-flash all areas with one of the following methods:
 - 1) Apply a three- course method: coating and fabric utilizing the PF 200 Polyester Fabric and HS 3200 Silicone Coating.
 - 2) Install Pro-Patch FG 400 Flashing Grade Silicone Sealant.
3. Sheet Metal
 - a. Ensure all sheet metal accessories are in good condition and will provide a watertight condition. If necessary, replace or repair any sheet metal required to provide a watertight condition.
4. Roof Parapets
 - a. Seal all roof parapet seams with one of the following methods:
 - 1) Apply Pro-Patch FG 400 Flashing Grade Silicone Sealant onto parapets using a stiff-bristled paint brush or putty knife.
 - 2) A three-course coating-fabric-coating by applying one coat of Pro-Eco Sil HS 3200 at 1.75 gallons per square, embed PF 200 Polyester Fabric into wet coating, then apply another coat of Pro-Eco Sil HS 3200 at 1.75 gallons per square.
 - PF 200 Polyester Fabric should extend a minimum of 8" up parapet to ensure proper watertight condition.
5. Cracks and Seams
 - a. For stress cracks smaller than ¼", apply a heavy coat of Pro-Patch FG 400 Silicone Sealant in the crack and 1" on each side of it. Allow coating to dry for 2-4 hours before installing base coat.
 - b. For stress cracks or expansion joints larger than ¼", insert backer rod into the crack, then, apply a heavy coat of Pro-Patch FG 400 over the crack and 1" on each side of it. Ensure the backer rod is completely encapsulated. Allow the Pro-Patch FG 400 to dry for 24 hours prior to installing basecoat.

B. EPDM

1. Membrane Cleaning:
 - a. Apply Pro-Prime P-120 EPDM Rinseable Primer at a rate of 400 sq ft per gallon, let material stand for 15 minutes and then rinse off.
 - b. Thoroughly power wash roof surface and all other areas to receive new coating with a minimum of 2,000 psi water pressure. Be sure not to damage existing membrane during this process.
 - c. After the surface has dried, perform an adhesion test. If the coating does not properly adhere to the surface, repeat steps 1 and 2 above.
 - d. Any areas of grease contamination are to be cleaned with an industrial strength detergent.
2. Flashings Details: Ensure all existing flashings provide a watertight condition. If necessary, re-flash any areas required utilizing 4" FT 500 Butyl Fleece Tape and install 25 mils of Pro-Eco Sil HS 3200 Silicone Coating over tape.
3. Sheet Metal: Ensure all sheet metal is in good condition and will provide a watertight condition. If necessary, replace or repair any sheet metal required.
4. Fastener Back Out: Identify and replace all fasteners that are loose or backed out. Repair membrane

- cuts utilizing a three – course method.
- C. Modified Bitumen or Smooth Surface Built-Up
1. Membrane Cleaning:
 - a. Thoroughly power wash roof surface and all other areas to receive new coating with a minimum of 2,000 psi water pressure. Be sure not to damage existing membrane during this process.
 - b. After the surface has dried, perform an adhesion test. If the coating does not properly adhere to the surface or to prevent bleed through, apply Pro-Prime P-160 Asphalt Bleed Blocker at a rate of 1 gallon per square.
 - c. Any areas of grease contamination are to be cleaned with an industrial strength detergent.
 1. Flashings Details: Ensure all existing flashings provide a watertight condition. If necessary, re-flash any areas required utilizing a 3-course coating fabric detail as outlined above.
 3. Lap Seam Treatment:
 - a. Identify and repair all lap seam failures utilizing a 3-course coating fabric detail as outlined above.
 - b. To ensure complete encapsulation of the lap seams, install 20 mils (app. 2" wide) of Pro-Eco Sil HS 3200 Silicone Coating over all lap seams prior to coating the field of the roof. Coverage rate to be approximately 100 lf. per gallon.
 1. Sheet Metal: Ensure all sheet metal is in good condition and will provide a watertight condition. If necessary, replace or repair any sheet metal required.
 5. Primer: Pro-Prime P-160 Asphalt Bleed Blocker over entire roof area and flashings at a rate of 1 gallon per square.
- D. PVC, TPO, Hypalon
1. Membrane Cleaning:
 - a. Thoroughly power wash roof surface and all other areas to receive new coating with a minimum of 2,000 psi water pressure. Be sure not to damage existing membrane during this process.
 - b. After the surface has dried, perform an adhesion test. If the coating does not properly adhere to the surface, apply Pro-Prime P-151 Single Ply Primer at a rate of 1/3 gallon per 100 square feet.
 - c. Any areas of grease contamination are to be cleaned with an industrial strength detergent.
 - d. Flashings Details: Ensure all existing flashings provide a watertight condition. If necessary, reflash any areas required utilizing our FG-400 sealant.
 - e. Membrane Seams: Repair all seam failures utilizing three course method.
 - f. Sheet Metal: Ensure all sheet metal is in good condition and will provide watertight condition. If necessary, replace or repair any sheet metal required.
 - g. Fastener Back Out: Identify and replace all fasteners that are loose or backed out. Repair membrane cuts utilizing a 3-course coating fabric detail as outlined above.

Wet Insulation Remediation

- A. Existing Wet Insulation Areas:
1. Roof areas containing moisture below the roof surface shall either be replaced, or for areas less than 500 sq. ft. with moderate moisture content, a moisture relief vent shall be installed.
 2. Wet Insulation Replacement (wet area is greater than 500 sq. ft.)
 - a. Cut three sides of membrane and fold back to expose wet insulation.
 - b. Remove and replace insulation with identical insulation materials. Fasten new insulation at a rate of 1 fastener per 2 square feet.
 - c. Fold original membrane back over top of the new insulation.
 - 1) Membrane cuts are to be fastened with barbed membrane seam fasteners staggered 6" o.c.
 - 2) Install 20 mils of HS 3200 coating approximately 16" wide centered over membrane cuts.
 - 3) Install 12" wide PF 212 Polyester Fabric into the wet coating. Smooth out fabric and ensure there are no wrinkles or fish mouths.
 - 4) Install another coat of HS 3200 at a rate of approximately 20 mils over new fabric.
 3. Moisture Relief Vent Installation (wet area is less than 500 sq. ft.)
 - a. Locate center of moisture-containing insulation.
 - b. Cut a 4" diameter opening through the coating, membrane and insulation material; remove material to vapor barrier or deck.
 - c. Lay the MRV 600 Roof Vent on top of roof system and attach vent to the roof deck with the appropriate fastener. Install 4 fasteners per vent, evenly spaced.

- d. Clean area of vent that is to receive flashing material with clean rag and solvent to remove oil film from vent.
- e. Flash in vent with one of the two following procedures:
 - 1) Apply a 3-course coating and fabric utilizing the PF 200 Polyester Fabric and HS 3200 Silicone Coating.
 - 1) Apply 12 to 15 mils of silicone coating over surface to receive fabric.
 - 2) Embed fabric into silicone coating while still wet. Fabric should extend at least 2" on to the flange of the vent and at least 4" on to the roof surface.
 - 3) After the base coating has cured, apply a generous coat of silicone coating over the fabric to ensure complete saturation.

3.3 Reinforced Silicone Coating Installation

- A. Ensure surface is completely dry.
- B. Ensure subsequent coats of primer or silicone coating is completely cured.
- C. Ensure adhesion tests have been completed and results are satisfactory with the manufacturers requirements.
- D. Install PS 900 Pro-Shield Max Base coat at a rate of 2.0 to 2.25 gallons per square (depending on surface texture). While coating is still wet, embed Polyester Fleece 36" fabric. Use a nap roller to smooth out fabric to ensure there are no wrinkles or fish mouths. Note: each roll of fabric should overlap the previous roll by 3".
- E. Install an additional 1.5 gallons per square overtop of the Polyester Fleece fabric.
- F. Install HS 3200 silicone coating over entire roof surface at a thickness of:

- 1. 15 mils minimum for a 5-year warranty
- 2. 20 mils minimum for a 10-year warranty
- 3. 25 mils minimum for a 15-year warranty
- 4. 30 mils minimum for a 20-year warranty

- G. Care should be taken to ensure proper coverage on all vertical surfaces which could take multiple coats.

NOTE:

- 1. Any subsequent roof repairs after the coating installation should be done only with silicone products. Repairs should be completed with a three-course coating and fabric if needed.

3.4 Walkway System

- A. Install the Pro-Grip Walkway System at heavy traffic areas and at high impact areas as directed by the owner.

1. Walkway Areas

- a. Walkways should be a minimum of 30" wide.
- b. Mask off area to receive walkway system to ensure clean, straight edges.
- c. Install PG 700 Pro-Grip Yellow Walkway Coating at a thickness of 25 mils.
- d. Immediately after the application of the PG 700, broadcast PG 750 Pro-Grip Walkway Granules into the coating at a rate of 40 lbs. per 100 square feet. The granules will settle into the coating. Apply the granules generously, inspect the surface within a few minutes and reapply as needed to obtain a continuous film of granules.

2. High Impact Areas (around mechanical equipment, etc.)

- a. Mask off area to receive walkway system to ensure clean straight edges. Area should be 30" wide around all identified equipment.
- b. Install PG 700 Pro-Grip Yellow Walkway Coating at a thickness of 40 mils.
- c. Immediately after the application of the PG 700, broadcast PG 750 Pro-Grip Walkway granules into the coating at a rate of 60 lbs. per 100 square feet. The granules will settle into the coating. Apply the granules generously, inspect the surface within a few minutes and reapply as needed to obtain a continuous film of granules.

- B. After the coating has completely cured, remove all loose granules with a small hand blower and a soft bristle broom.

3.5 Field Quality Control

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation upon completion and submit report to Owner/Architect. There shall be no items on the roof that could inhibit the inspection process, such as, solar panels, paver systems, etc.

- 1. Notify Owner 48 hours in advance of date and time of inspection.

- a. Repair or remove and replace components of roofing system where inspection results indicate that they do not comply with specified requirements.

3.6 Protection of Finished Work

- A. Ensure roof surface is free of traffic for minimum of 12 hours after silicone coating application or until coating is completely cured.
- B. Ensure any subsequent work does not cause damage to finished roof system. If necessary, install protection over finished roof area.

END OF SECTION