

Section 07560 Fluid-Applied Roofing

Metal Roof Preservation System Master Guide Specification

1 PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A.** Rough Carpentry: Section 06100
- B.** Board-Stock Roof Insulation: Section 07220
- C.** Flashing & Sheet Metal: Section 07620
- D.** Roof Accessories: Section 07800
- E.** Prefabricated Expansion Joints: Section 07860
- F.** Painting: Section 09900

1.2 QUALITY ASSURANCE

A. Qualifications of Contractor

- (1)** The Contractor shall be acceptable to the Primary Coating Materials Manufacturer for application of its roof coatings products, and shall have a minimum of three (3) years experience in the application of elastomeric roof coatings.
- (2)** The Contractor shall provide a list of project references similar in nature to the one proposed, including contact names and telephone numbers.

B. Qualifications of Manufacturer

- (1)** Manufacturer of the fluid applied elastomeric coating system shall have a proven track record of successful installations of elastomeric technology.
- (2)** Other Manufacturer's products shall be accepted for use on this project only after submittal of product data files to the Architect or Owner supporting quality, equality and full compliance with specifications herein. The Architect or Owner reserves the right to reject the substitution proposals should it be determined the submittals do not provide all functions required for application.
- (3)** Approved products shall be manufactured exclusively from 100% advanced acrylic resins.
- (4)** Manufacturer to be certified ISO 9001:2008

C. Testing and Labeling

- (1)** The coating system to be U.L. Classified tested in compliance to UL790 Class A fluid-applied system for maintenance and repair of existing Class A, B or C roofing constructions. Products to be subject to Underwriters Laboratory Follow-up Services.
- (2)** The acrylic coating to be FM Global Approved and listed as an acceptable recoating system over existing roof substrates.
- (3)** The acrylic coating to be approved by Miami-Dade County Building Code Compliance with as active Notice of Acceptance (NOA).
- (4)** The Manufacturer shall also provide recognized, third party independent test results confirming the coating system's conformance to ASTM D6083-05.

- (5) Individual container labels must include the following information or they will be rejected at the jobsite: Manufacturer's name, product name, type and class of material, all applicable Code and Testing approval logos, batch or lot number, mixing and application instructions, and precautions.

1.3 SUBMITTALS

- A. Submit Manufacturer's literature, certificates and samples in a single package to the Architect or Owner in accordance with requirements specified in General Conditions.
- B. Manufacturer's Literature: Literature on the protective coating, as well as related primers, sealants, reinforcement, etc., shall be submitted for review before work is started. Literature shall show material specifications, physical properties (including ASTM test methods utilized), and manufacturer's estimated application rate for required dry mil thickness per warranty requirements, current application instructions and SDS.
- C. Applicator's Qualifications: Submit a copy of manufacturer's registration or certification as issued by the Manufacturer.
- D. Warranty: Submit a copy of Primary Coating Materials Manufacturer's warranty to comply with project requirements.

1.4 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Delivery of Materials: Materials shall be delivered to the jobsite in Manufacturer's original, sealed containers with labels legible and intact.
- B. Storage of Materials: Materials shall be stored in an area specifically designated for that purpose, in accordance with Manufacturer's recommendations, where temperatures will not be less than 50°F (10°C) or higher than 100°F (38°C). Protect from freezing at all times.
- C. Material Handling: Materials shall be handled, stored and installed per Manufacturer's instructions and all applicable safety regulatory agencies.
- D. Damaged Materials: Contaminated, damaged or unsealed materials, or materials not conforming to the specified requirements shall not be used in the installation. Rejected containers shall be immediately removed from the jobsite and replaced at no additional cost to the Owner.

1.5 ENVIRONMENTAL CONDITIONS

- A. Install all materials in strict accordance with Manufacturer's published safety, weather and temperature precautions.
- B. Do not apply elastomeric coating system components when the ambient and/or surface temperature is below 50°F (10°C) or above 110°F (43°C), if surface moisture is present, when the dew point is within 5°F (3°C) of the surface temperature or when there is a possibility of temperatures falling below 32°F (0°C) within a 24 hour period. Do not apply if weather conditions will not permit complete cure before rain, dew, fog or freezing temperatures occur. Do not spray apply if the wind velocity exceeds 10 mph (16 kph) without taking precautions to eliminate overspray.
- C. Take all measures necessary to protect unrelated work and other adjacent surfaces from coating overspray or spillage.

1.6 FIELD QUALITY CONTROL

- A. The overall weather conditions, including surface temperature, surface moisture, ambient temperature, relative humidity and wind velocity shall be recorded by the Contractor, at designated time intervals, on the Daily Quality Control Report form if so requested by the Architect or Owner.
- B. Verification of Protective Coating Thickness: During application of the elastomeric coating, the wet film thickness shall be measured and recorded daily, along with the quantity and

batch numbers of the material applied and total square feet coated, on the Daily Quality Control form.

1.7 WARRANTY

- A. 10-Year Coating System Warranty
- B. 15-Year Coating System Warranty
- C. 20-Year Coating System Warranty

2 PART 2 – PRODUCTS

2.1 DESCRIPTION: A seamless, fluid applied membrane system designed for application over metal roof substrates. Approved system shall be KM Coatings Metal Roof Coating System.

2.2 SUBSTITUTIONS

- A. Acrylic coatings extended with styrene, vinyl or other ingredients are not allowed. Materials such as cementitious, ceramic-filled or asphalt modified coatings, moisture-cured urethanes, SBS or SEBS based rubbers, silicone and butyls are not considered acceptable substitutes for materials specified herein.

2.3 MATERIALS

- A. Construction Grade Sealant: single package polyurethane sealant as approved by Coating Manufacturer for use on termination bars and counterflashing. Caulk must comply with ASTM C920.
- B. Acrylic Flashing Cement: Acrylicalk, Premium Grade Acrylic Flashing Compound

| Test Property | Test Value | Test Procedure |
|-----------------------------------|------------|-----------------------------|
| Accelerated Weathering @ 1000 hr. | Pass | ASTM D 4798 |
| Flash Point (°F) | >212 | PMCC |
| Fungi Resistance | Pass | ASTM G 21 |
| Elongation (%) | 180 ± 20 | ASTM D 2370 |
| Tensile Strength (psi) | 325 ± 25 | ASTM D 2370 |
| Viscosity (cP) | >150,000 | Brookfield© 4d/5 rpm @ 77°F |
| Permeance (perms) | 2 – 3 | ASTM D1653 |
| Weight per gallon (lb) | 12.5 ± 0.5 | ASTM D 2939 |
| Solids Weight (%) | 68 ± 2 | ASTM D 1644 |
| Solids Volume (%) | 54 ± 2 | ASTM D 2697 |
| VOC (gm/L) | <50 | Std. Method |
| pH (rating) | 10 ± 1 | Std. Method |

C.**SEBS Flashing Cement: KM 1217, Premium Grade SEBS Flashing Compound**

| Test Property | Test Value | Test Procedure |
|-----------------------------------|-------------------|-----------------------------|
| Accelerated Weathering @ 1000 hr. | Pass | ASTM D 4798 |
| Elongation (%) | 950 ± 50 | ASTM D 412 |
| Tensile Strength (psi) | 1300 ± 50 | ASTM D 412 |
| Viscosity (cP) | 110,000 ± 10,000 | Brookfield© 4d/5 rpm @ 77°F |
| Weight per gallon (lb) | 8.5 ± 0.5 | ASTM D 2939 |
| Solids Volume (%) | 45 ± 2 | ASTM D 2697 |
| VOC (gm/L) | <510 | Std. Method |
| Coverage Rate (gal./100 sq. ft.) | 1 | KM Manufacturing |
| Storage Temperature (°F) | 40-100 | KM Manufacturing |

D. Reinforcement Fabric: Stitch bonded polyester fabric, KM Reinforcing Polyester

| Test Property | Test Value | Test Procedure |
|----------------------|----------------------------|-----------------------|
| Thickness (in.) | 0.018 | ASTM D 1777 |
| Tensile Strength | MD: 67 lbs. CD: 59 lbs. | ASTM D5034 |
| Trapezoid Tear | MD: 22 lbs. CD: 21 lbs. | ASTM D 3787 |

A. Fluid Applied Elastomeric Products:**(1) Surface Coating: KM Acryl 40-HS High Quality Elastomeric Roof Coating**

| Test Property | Test Value | Test Procedure |
|-----------------------------------|-------------------|-----------------------------|
| Accelerated Weathering @ 1000 hr. | Pass | ASTM D 4798 |
| Flash Point (°F) | >212 | PMCC |
| Fungi Resistance | Pass | ASTM G 21 |
| Elongation (%) | 220 ± 25 | ASTM D 2370 |
| Tensile Strength (psi) | 275 ± 50 | ASTM D 2370 |
| Viscosity (cP) | 28,000 to 58,000 | Brookfield© 4d/5 rpm @ 77°F |
| Weight per gallon (lb) | 12 ± 0.5 | ASTM D 2939 |
| Solids Weight (%) | 70 ± 2 | ASTM D 1644 |
| Solids Volume (%) | 60 ± 2 | ASTM D 2697 |
| VOC (gm/L) | <50 | Std. Method |
| pH (rating) | >9 | Std. Method |

(2) Surface Coating: KM Acryl 15 Premium Grade Elastomeric Roof Coating

| Test Property | Test Value | Test Procedure |
|-----------------------------------|-------------------|-----------------------------|
| Accelerated Weathering @ 1000 hr. | Pass | ASTM D 4798 |
| Flash Point (°F) | >212 | PMCC |
| Fungi Resistance | Pass | ASTM G 21 |
| Permeance (perms) | 27(wet), 13(dry) | ASTM D1653 |
| Elongation (%) | 200 ± 25 | ASTM D 2370 |
| Tensile Strength (psi) | 350 ± 50 | ASTM D 2370 |
| Flexibility @ 0°F mandrel | Pass | ASTM D 522B |
| Viscosity (cP) | 28,000 to 58,000 | Brookfield© 4d/5 rpm @ 77°F |
| Weight per gallon (lb) | 11 ± 0.5 | ASTM D 2939 |
| Solids Weight (%) | 63 | ASTM D 1644 |
| Solids Volume (%) | 51 | ASTM D 2697 |
| VOC (gm/L) | <50 | Std. Method |
| pH (rating) | >9 | Std. Method |

3 PART 3 – EXECUTION

3.1 SURFACE INSPECTION: Inspect all roof surfaces to receive work specified under this section to ensure that the following conditions exist:

- A.** Roof surfaces shall be clean, dry, and structurally sound, stable and well secured.
- B.** The roof surface shall be free of excessive ponding water. A roof surface that allows standing water 48 hours after a rain shall be considered unacceptable. Roof must have positive drainage.
- C.** Inspect condition of flashing details adjacent to protrusions, penetrations, roof mounted equipment, curbs, walls, parapets, drains and roof edge to ensure that details are acceptable and will maintain a weather-tight installation after being properly detailed and coated.

3.2 SURFACE PREPARATION

- A.** All surfaces shall be clean and dry, and free of any dirt, dust, gravel, oil, surface chemicals or other contaminants that may interfere with optimum adhesion.
- B.** All mechanical fasteners shall be checked for integrity. Retighten or replace as necessary. "Stripped out" fasteners shall be replaced using a larger diameter fastener.
- C.** Unsound rust shall be wire brushed, sandblasted or mechanically abraded to remove all loose rust. Metal panels deteriorated to the point that their structural integrity is compromised shall be replaced.
- D.** Remove excessive amounts of asphaltic-based or other deteriorated patching/flashing materials if present.
- E.** Check all seams to ensure that they are tight and flush. Excessive gaps or deflections between panels shall be eliminated by installing additional screws or rivets as necessary to restrict deflection to ¼" (6 mm) or less.

- F.** All metal surfaces, whether new or existing, shall be cleaned using under high pressure (minimum 2,500 psi) to remove contaminants, along with any existing loose paint or coating. Heavy deposits of dirt or contamination may require agitation with a stiff-bristle broom or other mechanical scrubber. Allow the roof to dry thoroughly.
- G.** KM Coatings recommends: Adhesion Tests, one (1) test every 10,000 sq. ft.
- (1)** Procedure: In accordance with ASTM D 903
- (a)** Clean area at least 12 inches by 12 inches
 - (b)** Prime area and permit to cure
 - (c)** Coat area at specified rate
 - (d)** While coating is still wet, embed 2-inch wide polyester fabric across test patch leaving 6-inch long dry section outside of test patch.
 - (e)** Apply second coat to totally encapsulate flashing fabric and allow to cure for 14 days minimum.
 - (f)** Pull dry end of flashing fabric with calibrated scale to failure of adhesion.
- (2)** Passing criteria: two (2) pounds minimum resistance prior to failure.
- (a)** If adhesion test fails, additional cleaning and/or priming may be required.
- H.** Fill gaps between $\frac{1}{4}$ " and $\frac{1}{2}$ " at panel seams, joints and protrusion with KM Acrylicalk or KM 1217. Fill gaps larger than $\frac{1}{2}$ " using backer rod or spray applied polyurethane foam.
- I.** All horizontal (end-lap) seams and vertical (side-lap) seams that have not been factory crimped or pre-sealed, roof terminations and flashings, around drains, scuppers and skylights, and base of all vents, conduits, HVAC equipment and other protrusions shall be reinforced using one or more of the following methods;
- (1)** Apply a base coat of KM Acrylicalk using brush along the area to be detailed. While coating is still wet, embed a strip of 6" or 12" polyester mesh as per detail requirements, centered over the seam, joint or interface. Work the mesh into the coating applying additional material as necessary to totally encapsulate the reinforcing fabric.
 - (2)** Apply KM Acrylicalk elastomeric mastic at a thickness of 60 to 80 dry mils over the detail area. Extend the sealant a minimum of 2" on either side of seams, joints and interfaces. Sealant must be applied in 2 coats.
 - (3)** Apply KM 1217 SEBS Flashing Cement at a rate of 1.5 gallons per 100 sq. ft., 24 wet mils (.6 l/m²). Extend the sealant a minimum of 2" on either side of seams, joints and interfaces. Once dry, a second coat must be applied at the same rate as the first.
- J.** At the interface of any metal with a dissimilar material, detail the joint using one of the following methods:
- (1)** Apply 6" Polyester Mesh embedded into the base coat of KM Acrylicalk as previously described in the previous section.
 - (2)** Apply KM Acrylicalk elastomeric mastic as previously described.
 - (3)** Apply KM 1217 SEBS Flashing Cement as previously described.
- K.** All mechanical fastener heads shall be treated using one of the following methods:
- (1)** Apply KM Acrylicalk elastomeric mastic to completely encapsulate the screw head and seal the base of the fastener to the metal deck.
 - (2)** Apply KM 1217 SEBS Flashing Cement to completely encapsulate the screw head and seal the base of the fastener to the metal deck.

3.3 ELASTOMERIC COATING APPLICATION

- A. All roof preparation materials shall be allowed to fully dry prior to full roof surface application of the elastomeric coating system.
- B. Immediately prior to application of the coating system, all dust, dirt and other contaminants shall be blown off the roof surfaces to be coated using high pressure compressed air.
- C. It is often easier to visually see deficiencies or other damage in the roof's surface after application of the first coat. For this reason the roof surface should be inspected after application of the first coat for any damage that was not detailed previously.
- D. The entire roof substrate shall receive elastomer coating applied as follows:
Note: Airless spray is the preferred method of application. A medium to heavy nap roller may be used for application over flat substrates. Brush or roller may be used for touch-up or detail work or for small areas that are not practical for spray application.
- E. **10 Year Warranty Installations:**
 - (1) After allowing the base coat to dry, apply two (2) coats of surface coating at a minimum rate of 1.25 gallons per 100 sq. ft., 20 wet mils (0.5 l/m²) with a dry film thickness (DFT) of 10 mils per coat. Use a medium-nap roller or airless spray to apply the elastomeric coating. Apply consecutive coats in a perpendicular direction to the previous coat.
 - (2) Total DFT = 20 dry mils
or**15 Year Warranty Installations:**
 - (3) After allowing the base coat to dry, apply three (3) coats surface coating at a minimum rate of 1.25 gallons per 100 sq. ft., 20 wet mils (0.5 l/m²) with a dry film thickness (DFT) of 10 mils per coat. Use a medium-nap roller or airless spray to apply the elastomeric coating. Apply consecutive coats in a perpendicular direction to the previous coat.
 - (4) Total DFT = 30 dry mils
or**20 Year Warranty Installations:**
 - (5) After allowing the base coat to dry, apply three (3) coats surface coating at a minimum rate of 1.5 gallons per 100 sq. ft., 20 wet mils (0.6 l/m²) with a dry film thickness (DFT) of 10 mils per coat. Use a medium-nap roller or airless spray to apply the elastomeric coating. Apply consecutive coats in a perpendicular direction to the previous coat.
 - (6) Total DFT = 36 mils
- F. The topcoat shall extend up and over all roof substrates on vent pipes, parapets and other protrusions to terminate a minimum of 3" above the substrate, creating a self-terminating flashing and so as to provide an aesthetically pleasing appearance.

3.4 CLEANUP

- A. Maintain work and work areas in a clean, safe condition at all times during reroofing installation. Remove excess materials, trash and debris from the jobsite daily.
- B. At the completion of the project, clean area of any spills and containers, and clean up all roofing debris, leaving jobsite in a clean and orderly condition.

3.5 WARRANTY

- A.** Upon completion of the roof coating system, the Coating Manufacturer's Representative, Owner's Representative, Architect and Applicator shall make a final roof observation to determine the dry film thickness of the fluid applied membrane and to verify that the system meets the Manufacturer's requirements for warranty. The Contractor shall notify all interested parties in advance of said roof observation.
- B.** As a condition of the project's completion and acceptance, deliver to the Owner a copy of the fully executed, specified warranty from the Coating Manufacturer, following individual warranty guidelines.