

EPDM ROOF RESTORATION

This guide specification governs the installation of thermoplastic rubber coatings for the repair and resurfacing of fully adhered and mechanically fastened EPDM membranes. The use of a reflective, low perm resurfacing material over EPDM is designed to extend service life and improve energy efficiency with a sustainable polymer coating system.

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SECTION 07540

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PART ONE - GENERAL

1.01 DESCRIPTION

- A.** General: Provide all labor, materials, equipment and tools as required to repair and coat existing EPDM roof membrane with new materials as specified.
- B.** The installation is understood to include sealing of roof joints, including but not limited to field seams, curbs, and penetrations.

1.02 QUALITY ASSURANCE

- A.** Qualifications of Manufacturer
 - 1. Provide primary roof coating product from a single manufacturer which has successfully marketed and supplied the products for not less than 15 years. Provide secondary accessory materials only as recommended and approved by manufacturer of primary materials.
 - 2. Primary products shall include spray, brush, trowel grade coatings, and polyester membrane.
 - 2. Products primary and secondary shall be manufactured in United States of America.
- B.** Qualifications of Contractor
 - 1. The Contractor shall use adequate numbers of qualified workers who are thoroughly trained in the crafts and techniques required to properly install the type of roof coating proposed for use and other work required to complete the work specified.
 - 2. A single installer (roofing contractor or industrial painter) will perform the work. The installer must be trained and certified by product manufacturer, and show written evidence of his authorized status.
 - 3. The installer will own or have access to the equipment necessary, and shall meet all safety, insurance, and technical requirements of the building owner.

C. Warranty

1. The Contractor shall coordinate all necessary inspections, corrections, re-inspections (if any), and certifications with the coating manufacturer as required.
2. Warranty requirements apply only to resurfaced areas as described in base bid of this section.
3. Warranty period is for 10 years, and shall start at date of substantial completion.

1.03 PRELIMINARY ROOF INSPECTION

A. The roofing installer and manufacturer's representative shall tour the roof area and collect submittal data (three membrane cuts) which will be re-sealed using #7145-9 and fabric. Manufacturer's representative will record and submit any disputes or concerns governing the installation of the roof system. The installer will complete and submit the manufacturer's "Roof Inspection Report" along with pre-application photos depicting the overall roof area and details representative of the installation.

1.04 PRELIMINARY PROJECT REVIEW

Provide and review the following documentation to all parties directly concerned with the work, including the building owner, property manager, architect or roofing consultant:

- A.** Three sample cuts of the roof membrane, approximately 2 square inches. Select samples that are representative of the overall roof condition.
- B.** Specification, including product data, warranty terms, and installation guidelines.
- C.** Material Safety Data Sheets,
- D.** Product Liability Insurance, and
- E.** Safety requirements.
- F.** Evaluation of the roofing material's physical properties and performance characteristics as verified by an independent, accredited testing agency.
- G.** Installer's Certificate of Authorization, signed by manufacturer.

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H. Roof Inspection Report, including infrared moisture scans, core samples and other details regarding the overall condition of the deck, insulation boards and overall roof assembly.

I. Review Project Contract, including installer's logistical requirements such as water and electrical access, material storage area, designated work areas for ground to roof delivery of materials, personnel, etc. Determine work parameters required for a timely, efficient installation with minimal effect on the facilities normal operations.

J. Provide a schedule estimating the project's expected completion date. Consider the possibility of a delay due to poor weather conditions or other external factors. Establish provisions for addressing primary waterproofing concerns in lieu of a completed installation when nearing the winter season.

1.05 FACTORY MUTUAL

A. Upon express request, provide flame retardant materials in accordance with Factory Mutual flame-spread testing. (ASTM #E108-87, Uniform Building Code test method 32-7)

1.06 INSTALLATION PARAMETERS:

A. Emergency spot repairs to the applied system can be made in the winter or during inclement weather. However, extensive repairs or system installations should not be considered unless the following conditions are met:

1. Surface must be clean and dry prior to application of coatings.
2. Do not begin work if surface temperature is above 150 degrees Fahrenheit or below 60 degrees Fahrenheit.
3. Do not apply coating when rain is expected within 8 hours due to potential deformation of the membrane, or when the dew point is less than 5 degrees Fahrenheit above the surface temperature.
4. Do not atomize coatings if wind velocity is above 15 m.p.h.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver only approved materials to the job site. Deliver materials in original sealed containers with seals unbroken and labels legible and intact.

B. Materials shall be delivered in sufficient quantities so as not to cause delays in work.

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C. Store and handle materials in a manner which will ensure that there is no possibility of contamination. Store in a dry, well-ventilated, weather-tight place, at temperatures between 50 degrees and 80 degrees F. Do not stack pallets more than two (2) high. Do not subject existing roofing to unnecessary loading. In all cases, the storage and handling of materials shall conform to the requirements of the manufacturer and all applicable safety regulatory agencies.

D. Material containers shall not be removed from the job site until final completion and/or until so authorized by the owner. All waste materials and debris shall be cleaned up daily.

E. Any damaged materials or materials not conforming to the specified requirements shall be rejected by the owner. Rejected materials shall be immediately removed from the job site and replaced at no additional cost to the owner.

1.08 EQUIPMENT:

A. Roof coatings are effectively applied using airless spray systems.(However, if applied manually, use a long nap, solvent resistant roller or nylon bristle brush.) Conventional air atomized spray systems can be used, but over-spray and drift are more pronounced. Recommended Airless Spray Equipment, gasoline driven:

Graco GH 733	-	4050 psi and 3 gal/m capacity
Graco GH 533	-	3000 psi and 2 gal/m capacity
Magnum 4000	-	4000 psi and 3 gal/m capacity
Hydra Pro IV	-	3000 psi and 2 gal/m capacity
or equivalent.		

B. Use only approved, high pressure, static grounded, solvent- resistant spray hose with the following minimum inside diameters:

- Maximum material hose length:
1. 50 ft. – 3/8" ID
 2. 150 ft. – 1/2" ID

C. Spray tips – Reversible, self-cleaning tip with an orifice diameter of .028 to .031 with 10" fan pattern; a .035 tip can be used when spraying brush grade mastic.

Spray pressure – 3000 psi at pump and 1700 psi min. at spray gun.

PART TWO – PRODUCTS

2.01 RUBBER ROOF COATING

A. Rubber roof coating products physical specifications and minimum performance criteria shall be in accordance with the following schedules:

RUBBERIZED FLASHING CEMENT #7174

<u>TEST</u>	<u>ASTM</u>	<u>RESULT</u>
Elongation at 77 deg. F.	ASTM D412	400%
Recovery from 100% Elongation		100%
Tensile Strength	ASTM D412	600 psi Min.
ADHESIVE BOND Aluminum Q-Panels		
Method A	D3359-90	5-highest rating
Method B	D3359-90	5-highest rating
PLIABILITY @ 0 deg.F.-180 deg. Bend	D2823-90	
1 inch mandrel		no cracking or separation
¼ inch mandrel		no cracking or separation
WATER VAPOR PERMEABILITY	E96-80	0.15 perms

BRUSH GRADE MASTIC #7141

<u>TEST</u>	<u>ASTM</u>	<u>RESULT</u>
Elongation @ 77 deg. F.	ASTM D412	600%
Elongation @ 32 deg. F.	ASTM D412	300%
Recovery from 100% Elongation		100%
Tensile Strength	ASTM D412	1500 psi
Viscosity	ASTM D562	135-143 K.U.

FIELD COATING #7145-2

<u>TEST</u>	<u>ASTM</u>	<u>RESULT</u>
Permeability, Water Vapor	ASTM E-96	0.2 perms
Peel Strength to EPDM	ASTM D903	3.946 lbf/in.
Dry film thickness @ 1 gal/100 sq.ft.		7 mils
Elongation @ 77 deg. F.	ASTM D412	200%
Elongation @ 32 deg. F.	ASTM D412	100%
Recovery from 100% Elongation		100%

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Tensile Strength	ASTM D412	200 psi
Shore A Hardness	ASTM D2240	70
Viscosity	ASTM D562	105-110 K.U.

RUBBER FINISH COAT #7140

<u>TEST</u>	<u>ASTM</u>	<u>RESULT</u>
Permeability, Water Vapor	ASTM E-96	0.2 perms
Water Absorption -166 hour immersion	ASTM D-471-79	0.356%
Dry film thickness @ 1 gal/100 sq.ft.		6 mils
Elongation @ 77 deg. F.	ASTM D412	600%
Elongation @ 32 deg. F.	ASTM D412	300%
Recovery from 100% Elongation		100%
Tensile Strength	ASTM D412	1500 psi
Shore A Hardness	ASTM D2240	65
Reflectivity –initial	Energy Star SSR-ER	86%
- 7 years		72%
Viscosity	ASTM D562	105-110 K.U.

2.02 POLYESTER MEMBRANE

A. Reinforcing membrane shall be composed of warp knit, 100% polyester yarn fibers offering an excellent combination of high strength and elongation to accommodate unusual stress forces from thermal shock or building movement.

TYPICAL PROPERTIES

Tensile Strength	ASTM D1682	90 lbs. (41 kg.)
Elongation	ASTM D1682	45%
Trapezoid Tear Strength	ASTM D1117	22 lbs. (10 kg.)
Ball Burst Strength	ASTM D3787	180 lbs. (82 kg.)

2.03 MANUFACTURER

A. The following roof coating manufacturers have been approved for this project. No substitutions by secondary, indirect manufacturers will be allowed.

1. Truco, Inc.
4301 Train Avenue
Cleveland, OH 44113
(800) 227-4569

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B. Other manufacturers requesting approval must submit acceptable information certifying that they are the direct manufacturer from raw material into the specified product and meet the performance criteria required.

PART THREE - EXECUTION**3.01 PREPARATION OF SUBSTRATE**

A. Review Moisture survey to identify wet insulation boards. These must be removed prior to the resurfacing effort. With minimal cuts, remove the wet board and dry vac cavity to remove residual moisture and debris prior to proceeding. Replace the insulation board. Secure the loose edge using a mechanically fastened bar strip, or via other approved industry fastening standards. Once fastened to the deck, seal both the membrane seam and fastening bar using a three course of #7145-2 with 6" reinforcing fabric.

B. Repair wall or curb flashings exhibiting excessive shrinkage of the rubber membrane per industry standards: Cut the membrane and secure the vertical and horizontal edge of the membrane to a cant strip that will subsequently be three coursed with fabric and rubber coatings. Otherwise repair with a new EPDM membrane affixed to a continuous fastening bar per original manufacturers recommendations.

C. Power wash the EPDM membrane using a wide fan spray and working pressure of approximately 800psi. Modest pressure is recommended to prevent moisture drive in to aged single-ply systems.

D. Allow roof to dry thoroughly. Trace residue of carbon black are acceptable to coating purpose.

3.02 APPLICATION

General-Graduated coverage, applied in warm & dry conditions allows for a strong bond with minimal, if any, deformation of the membrane.

- A. Apply a light base coat of #7145-2 (gray) at a rate of .75/gal per square in warm, dry weather conditions to avoid deformation of the membrane. Allow to cure overnight.
- B. Apply a second coat of 7145-2 (gray) to a clean, dry and wrinkle free surface at a rate of 1 gal per square in warm dry weather. Overlap spray pattern 25% and avoid a swinging, pendulum motion for best results. Field seam reinforcement can be incorporated into this coat. Upon application, embed 6" RH-53 polyester fabric on to the field seams on-center, using a soft bristle brush to eliminate voids or wrinkles. Apply a light coat over the fabric and allow to dry overnight. Do not allow uncoated fabric to be exposed to moisture.

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- C.** Vertical flashing work, if needed, may now be considered. Upon completion of second field coating and field seam reinforcement, examine all stacks, curbs, parapet walls and assorted flashings. Vertical flashings will require a heavier mastic coating, such as #7174 or #7141 as a base that extends one inch minimum beyond the fabric edge. The size of the flashing will determine the preferred width of the fabric. Standard width sizes are 4, 6, 12 & 40 inches. Embed fabric into wet mastic and lightly brush to remove voids and wrinkles.
- D.** Inspect all of the applied work and perform any necessary repairs. If any wrinkling is evident, allow additional time for coatings to cure before proceeding to the final field coating.
- E.** Apply a finish coat of #7140 at a rate of 1.25 gallons per square. A white color is standard and recommended for maximum reflectivity, UV resistance and potential energy savings. However, gray or specialty colors can be accommodated.
- F.** Schedule an inspection upon completion and inform all concerned parties of the inspection and date of substantial completion.

END OF SECTION