APPLICATION / SPECIFICATION DATA

M-C-THANE 4556-60 MIL

ELASTOMERIC URETHANE, ABRASION RESISTING ROOFING SYSTEM

1. GENERAL

1.1 Scope: This specification covers the installation of a proven durable, liquid applied, abrasion resistant, aliphatic urethane waterproofing system suitable for low-slope roofing surfaces subject to mechanical equipment and pedestrian traffic. It is a monolithic system, designed to keep concrete slabs from spalling by excluding moisture penetration during low temperature freeze-thaw cycling or high temperature, high humidity thermal cycling. This system incorporates long term adhesion, flexibility and impact resistance, while exhibiting superior weather and chemical resistance.

1.2 Work Included: Install waterproofing consisting of caulking and flashing reinforcing for joints, UI-7012 or UI-7119 Epoxy Primer, UI-7013 Base Membrane, UI-7014-HT Elastomeric Membrane and UI-7016-AL-HS Aliphatic Urethane Top Coat. Apply in accordance with these specifications and latest general instructions supplied by Urethane Polymers International, Inc. (UPI).

1.3 Work Not Included: Work under this section shall not include finishing and corrective work in connection with the surfaces which are to receive the liquid-applied coating system. Nor does it include furnishing and installation of metal flashing, drains, vents, ducts, curbs or any other penetration through the deck.

1.4 Condition of Concrete Surfaces:

1.41 The concrete surfaces shall be of sound structural grade, (3,000 psi compressive strength recommended) of adequate design and adequate thickness, and shall be finished with a power have a steel trowel followed by a fine broom, and shall be free of fins, ridges, voids or air entrained holes.
1.42 Concrete shall be cured by water curing method or a water solution of pure sodium silicate. Curing compounds or curing agents of any type shall not be used unless they have prior approval from UPI.
1.43 Concrete shall be cured at least 28 days and shall be sloped for proper drainage.
1.44 Saw-cut control joints and/or expansion joints shall have been properly installed at strategic points throughout the field of the deck to control cracking caused by deflection and shrinkage.
1.45 Any required crickets or drains should be installed at the time the main deck is poured (i.e. monolithic).
1.46 Voids, rock pockets and excessively rough surfaces shall be repaired with epoxy grout or ground to match the unrepaired areas.
1.47 When metal decking is used as the concrete from, it shall be of the "ventilating type".
1.48 All concrete decks poured over precast "T's", planks or slabs, shall have control joints placed directly over all corresponding joints or openings in the precast units.

1.5 Job Conditions:

1.51 Before any waterproofing work is started the waterproofing applicator shall thoroughly examine all surfaces for any deficiencies. Should any deficiencies exist, the architect, owner, or general contractor shall be notified in writing and application shall not begin until corrections are made.
1.52 Do not proceed with application of materials when deck temperature is less than 40°F or if precipitation is imminent.
1.53 Warn personnel against breathing of vapors and contact of material with skin or eyes. In confined areas, workmen shall wear the appropriate MSHA/NIOSH approved respiratory protective gear and protective clothing.
1.54 All gas flames and electrical apparatus shall be shut down prior to the start of and during coating application and curing.
1.55 Protect plants, vegetation, and animals which might be adversely affected by the coating operation.
1.56 These UPI Elastomeric Coating Systems should not be installed onto on-grade slabs, split slabs with buried membrane or onto slabs over unvented metal pans without prior approval from UPI.

2. QUALIFICATIONS

2.1 Factory Qualified:

2.11 Shall be experienced in successfully applying the same or similar materials and shall be specifically approved as a Factory Qualified Applicator in writing by UPI.
2.12 Shall be financially responsible and be ready and able to supply project guarantees and submit performance bonds, (if required).
2.13 Shall submit to the general contractor and the building owner the required certificates of insurance prior to starting the project.

2.2 Sample Submittals: Submit samples not less than 3" X 4" in size, showing the approximate applied thickness, texture and color. The submittal shall also include the manufacturer's application / specification sheet and a list of materials by name and quantity to be used on this project.

3. MATERIALS

The materials shall be delivered to the job site in the original sealed containers bearing the product name, color, manufacturer's lot number, directions for use and precautionary labels. All products listed are manufactured or supplied by UPI.
3.1 Caulking Compound: Shall be a one-component or two-component polyurethane compound approved by UPI.
3.2 Flashing Reinforcement: Shall be neoprene sheet at 45-60 mils thickness, polyester reinforcing fabric, or as recommended by the coatings manufacturer.
3.3 Primer: Shall be UI-7012 water-based or UI-7119 solvent-based Epoxy-Polyamine, low viscosity, two-component primer/sealer.
3.4 Base Membrane: Shall be UI-7013 single-component, high adhesion, moisture cured, polyurethane membrane and shall meet or exceed the following typical properties:

UI-7013 Base Coat

PROPERTY	*TYPICAL VALUE*	*TEST METHOD*
Composition	Aromatic Urethane	
Weight Solids	86 ± 2%	
VOC Content	Less than 200 gm/l	
Hardness, Shore A	65 ± 5	ASTM D-2240
Tensile Strength	900 ± 100 psi	ASTM D-412
Ultimate Elongation	550 ± 100%	ASTM D-412
Tear Resistance	150 ± 25 lb./in.	ASTM D-1004
Weather Resistance	Slight Checking at 500 hrs.	ASTM D-822
Adhesion to Concrete	25 pli	ASTM D-903
Low Temp Flexibility	-300°F	

3.5 Elastomeric Membrane: Shall be UI-7014-HT high tensile strength, moisture cured elastomeric polyurethane and shall meet or exceed the following typical properties:

UI-7014-HT Intermediate Coat

PROPERTY	*TYPICAL VALUE*	*TEST METHOD*
Composition	Aromatic Urethane	
Weight Solids	82 ± 2%	
VOC Content	Less than 250 gml	
Hardness, Shore A	80 ± 5	ASTM D-2240
Tensile Strength	2250 ± 250 psi	ASTM D-412
Ultimate Elongation	400 ± 100%	ASTM D-412
Tear Resistance	250 ± 50 lb./in.	ASTM D-1004
Weather Resistance	Slight Chalk at 1000 hrs.	ASTM D-822
Adhesion to Base Coat	25 pli	ASTM D-903

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3.6 Traffic-Resistant Top Coat: Shall be UI-7016-AL-HS single component, high tensile strength, abrasion resistant and weather-resistant aliphatic polyurethane coating and shall meet or exceed the following typical performance properties:

UI-7016-AL-HS Top Coat

PROPERTY	*TYPICAL VALUE*	*TEST METHOD*
Composition	Aliphatic, Saturated Polyester Urethane	
Standard Color	White	
Weight Solids	78 ± 2%	
VOC Content	Less than 250 gm/l	
Hardness, Shore A	90 ± 5	ASTM D-2240
Tensile Strength	3500 ± 300 psi	ASTM D-412
Ultimate Elongation	250 ± 50%	ASTM D-412
Tear Resistance	300 ± 50 lb/in	ASTM D-1004
Water Permeability	Less than 0.1 Perm	ASTM E-96
Weather Resistance	No Chalking @ 2000 hrs.	ASTM-D-822
Abrasion Resistance	Negligible Change, CS-17 wheels,1000 cycles, 1000 gm. load	ASTM C-501

3.7 Aggregate: Shall be rounded, non angular, preblended 20/40 mesh flint shot silica, or equivalent washed and kiln-dried aggregate.

3.8 Shelf Life: When continuously stored in interior storage at temperatures below 90°F and in the original sealed metal containers, the shelf life on the UPI urethane membranes and coatings shall be a minimum of 9 months after manufacture.

4. SUBSTRATE PREPARATION

4.1 Concrete Surfaces:

4.11 The concrete surface must be thoroughly clean, dry and free from any laitance, surface contaminates or cleaning residue. Acceptable methods of removing surface contaminants are sandblasting, mechanical grinding or acid etching followed by the complete and thorough removal or any residue.
4.12 All cracks over 1/16 inch in width and all moving cracks under 1/16 inch in width shall be routed out to ¼ inch minimum in width and depth and filled flushed with polyurethane elastomeric sealant.
4.13 All cracks shall be stripe-coated with 30 mils of UI-7013 Base Membrane for a distance of 2 inches on either side of the crack.
4.14 Apply a ¾ inch cant of sealant around all pipes, drains and vertical junctions.
4.15 All expansion and contraction joints shall be cleaned, primed, fitted with a backing rod and caulked with elastomeric polyurethane sealants. Joints under ½ inch in width and all caulked cracks shall be stripe-coated with a 30 mil preparatory coat of UI-7013.
4.16 Prior to commencing with the application, all surfaces to be coated shall be dry and free from any surface contaminates or cleaning residues.

4.2 Flashing Reinforcement:

4.21 All required metal or neoprene flashing and fabric flashing reinforcement shall be installed at this time. All sealant cants should be installed.
4.22 All metal shall be delivered shop primed and then be field primed with UI-7012 or UI-7119 Epoxy Primer prior to coating with the base membrane. (For metal surfaces which may exhibit adhesion difficulties, first prime with a zinc chromate or zinc rich type of epoxy primer.)
4.23 UI-7013 Base Membrane is used as an adhesive for the polyester reinforcing fabric. The reinforcing fabric shall be laid into the wet base membrane with roller, brush or broad blade knife. The fabric shall be laid relaxed, smooth and wrinkle-free and over-coated with base membrane.
4.24 Flashings and polyester reinforcing fabric shall be coated (with base coats and top coats) each time the deck is coated.

4.3 Priming: Stir each side separately and then mix all of Part A with all of Part B. Use a mixing paddle on a slow speed drill motor. Mix for 2 to 3 minutes and let mixed primer sit 10 minutes before applying.

5. APPLICATION OF MEMBRANE

5.1 Primer: Apply UI-7012 or UI-7119 Primer at the approximate rate of 250-300 square feet per gallon. Allow primer to dry until it is tack-free. Within 16 hours of application of the primer, the base coat must be applied. If the base coat can't be applied within 16 hours then reprime.

5.2 UI-7013 Base Membrane: shall be spray or squeegee and roller applied in one uniform coat at the rate of one gallon minimum per 66 square feet or as needed in order to obtain an average wet film thickness of 24 mils. Allow 16 to 48 hours curing time before applying the next coat. Do not apply coating system over joints greater than ½ inch wide.

5.3 UI-7014-HT Elastomeric Membrane: shall be spray or squeegee and roller applied in one uniform coat at the rate of one gallon minimum per 66 square feet or as needed in order to obtain an average wet film thickness of 24 mils. Allow up to a maximum of 36 hours curing time before applying the next coat. (If the preceding layers of membrane should become dirty or contaminated or lose their surface tack, wipe clean with xylene immediately before applying the next application.)

5.4: Apply additional UI-7014-HT Elastomeric Membrane in one uniform coat at the rate of one gallon minimum per 100 square feet or as needed in order to obtain an average wet film thickness of 16 mils. While the coating is still fluid, uniformly broadcast and thoroughly encapsulate 20/40 mesh aggregate into the coating at the rate of 25 lbs. per 100 square feet. (In certain situations where there is low abrasion and for ease of cleaning anticipated deposits of dirt or algae, the aggregate may be omitted.) Allow a maximum of 36 hours curing time before applying the next coat.

5.5 UI-7016-AL-HS Top Coat: shall be spray or squeegee and roller applied in one uniform coat at the rate of one gallon minimum per 100 square feet in order to obtain an average wet film coating thickness of 16 dry mils and to completely coat the aggregate.

5.6 Coating Thickness Requirements: Total coating system thickness excluding aggregate shall average 60 dry mils (DFT). Minimum dry film thickness (DFT) at any point on the roof shall not be less than 45 dry mils, excluding any aggregate, of which 9 dry mils must be Top Coat. This coating system is designed to be installed with no additions of aggregate into the first two primary layers of waterproofing coating.

6. FIELD QUALITY CONTROL

Field Service Inspection by an independent 3rd party or coating manufacturer's representative may be required to verify the proper installation of the system. Any areas that do not meet minimum standards for application as specified herein shall be corrected at the Qualified Applicator's expense. Manufacturer's inspection or verification shall not constitute acceptance of or responsibility for any improper application of material.

7. TRAFFIC ON COATED SURFACE

The completed coating system shall not be subject to any construction traffic during the first three (3) days after application is complete. If the application has not been approved by the owner, architect or prime contractor during the first three (3) days after application is complete, then there shall be no traffic of any type until such acceptance and approval is given.

8. GUARANTEE / WARRANTY

When this Elastomeric Coating System is installed by a Factory Qualified Applicator, is inspected and approved in accordance with these specifications, and after receipt of the final payment, the Factory Qualified Applicator shall issue the applicator's standard installation guarantee covering defects in material and workmanship.

UPI warrants its products to be free of defects in workmanship and materials only at the time of shipment from our factory. If any UPI materials prove to contain manufacturing defects that substantially affect their performance UPI will, at its option, replace the material or refund the purchase price.

The dollar value of UPI's liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the UPI materials in question.

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