APPLICATION / SPECIFICATION DATA

TUFFLEX SYSTEM #55-INT

LOW ODOR, MECHANICAL EQUIPMENT ROOM WATERPROOFING

1. GENERAL

1.1 Scope: This specification covers the installation of a low odor, abrasion resistant, urethane plus epoxy waterproof coating system suitable for interior mechanical equipment room decks. It is a monolithic system, designed with integral flashing reinforcement around and over equipment pads to effectively seal the areas underneath from moisture penetration. This system incorporates excellent adhesion, flexibility and abrasion resistance while demonstrating superior chemical stability. Physical stresses imposed by vibration of equipment will not cause delaminating or rupture of the waterproof coating system.

1.2 Work Included: Furnish and install the TUFFLEX SYSTEM #55-INT seamless waterproof flooring as manufactured by TUFFLEX Polymers (TUFFLEX). The flooring is to be installed to a minimum 0.060 inch thickness and shall be installed on a coved base to the height specified. Apply in accordance with the architectural drawings and room finish schedules as specified and the latest instructions supplied by TUFFLEX.

1.3 Work Not Included: Work under this section shall not include finishing and corrective work in connection with the surfaces to receive the waterproof flooring system. Nor does it include furnishing and installation of on-grade vapor barriers, metal flashing, drains, vents, or any other penetration through the floor.

1.4 Condition of Concrete Surfaces:

1.41 The concrete shall have been designed and installed to minimize random cracking and slab deflection and to provide sufficient control joints and isolation joints.
1.42 Variation in plane shall not be greater than plus or minus 1/8 inch in 10 feet in any direction. Proper slope to drain should be maintained.
1.43 A power steel trowel followed by a light broom finish is preferred for best results and to minimize surface preparation.
1.44 Concrete shall be clean, crack free, and durable (minimum thickness 3 inch, minimum compressive strength 3,000 psi) and dry. Concrete shall be free of fins, ridges, voids or air-entrained holes. Concrete must be free of hydrostatic and/or capillary moisture pressure and should not be in direct contact with the ground. If in doubt, a rubber mat test in accordance with ASTM D-4263 or a RMC calcium chloride moisture test should be conducted and results evaluated.
1.45 Allow new concrete floor slabs to cure 28 days minimum before applying the elastomeric waterproofing system.
1.46 Sealers, wax or resinous concrete curing compounds shall not be used on concrete surfaces which are to receive this waterproofing flooring system.

1.5 Temporary Services by General Contractor:

1.51 Temporary 120 V electrical service, adequate hoisting where necessary, and water for installer's use shall be provided at no coast by the General Contractor to the installer. Adequate heat, without flame, to maintain a room temperature of not less than 65ºF shall be provided 24 hours prior to, during and 24 hours after completion of the work at no cost to installer.

1.6 Protection:

1.61 During work, protect all surfaces of other trades against damage from work specified in this Section. Warn installation mechanics against breathing of vapors and contact of material with skin or eyes. In confined areas workers shall wear appropriate MSHA/NIOSH respiratory protective gear.
1.62 No smoking, gas flames, or sparking from electrical outlets, telephones or electrical motors shall be allowed in area of application. Install with adequate protection to air-handling and ventilation equipment.
1.63 Allow no traffic on the waterproofing system for 24 hours after completion and only light traffic for the first 96 hours. The General Contractor shall be responsible for protection of surfaces after final coats and until final acceptance by the owner.

2. QUALIFICATIONS

2.1 1 Installation Contractor:

2.11 Shall be experienced in successfully applying the same or similar materials and shall be specifically approved as a TUFFLEX factory qualified installer.
2.12 Shall be financially responsible and be ready and able to submit the required project warranty and any required completion bonds.
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 2 ½" 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 in order to demonstrate compliance with these specifications.

3. MATERIALS

All materials used under this specification, including primers, texturing agents, urethane membranes, epoxy binders, and reinforcing fabrics, shall be furnished or approved by TUFFLEX. The components shall be delivered to the job site in factory-sealed containers clearly marked with identifying labels.
3.1 Primer: Shall be TUFF-POXY Epoxy Primer #1, a 100% solids, two- component low odor, epoxy primer.
3.2 Urethane Base Membrane: Shall be TUFFLEX RBC "TUFF", a single component, solvent free, low odor, water-catalyzed urethane elastomeric membrane and shall meet or exceed the following typical properties.

TUFFLEX RBC "TUFF"

PROPERTY	TYPICAL VALUE	TEST METHOD
Composition	Aromatic Urethane	
Solids Content	99 - 100%	
Tensile Strength	1200 ± 100 psi	ASTM D-412
Tensile Elongation	700% ± 100%	ASTM D-412
Hardness (Shore A)	65 ± 5	ASTM D-2240
Tear Resistance	140 ± 25 lb./in.	ASTM D-624
Adhesion to Primed Concrete	30 pli	ASTM D-903

***3.3 Epoxy Top Coat*:** Shall be TUFFLEX-7059, a flexibilized, two-component, virtually 100% solids, low odor, chemical resisting and abrasion resisting epoxy coating and shall meet or exceed the following typical properties:

TUFFLEX-7059 TOP COAT

PROPERTY	TYPICAL VALUE	TEST METHOD
Composition	Flexibilized Epoxy	
Solids Content	99 - 100%	
Tensile Strength	3500 ± 300 psi	ASTM D-638
Hardness (Shore D)	70 ± 5	ASTM D-2240
Compressive Strength	5,900 psi min	ASTM D-695
Bond Strength	350 + psi	ASTM C-882
Abrasion Resistance	0.050 gm loss CS-17 wheels, 1000 gram weight	ASTM D-4060

***3.4 Exterior Exposure Top Coat*:** When applying onto exterior Roof Decks substitute the TUFFLEX 6500-RC Polyurea Top Coat for the TUFFLEX 7059 Epoxy Top Coat.

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3.5 Texturing Agents: Rubber granules shall be 16/40 mesh or 40/100 mesh EPDM rubber, Silica aggregate shall be 30-60 mesh or 20-40 mesh rounded, non-angular quartz granules or flint shot silica or other aggregate approved by the building owner. The aggregate shall be fresh water washed, kiln-dried, and shall be hard and stable to the anticipated use conditions.

3.6 Chemical Resistance: TUFFLEX-7059 Epoxy Top Coat has excellent resistance to intermittent contact at room temperature with the following chemicals:

Sulfuric Acid 10%	Bleach
Hydrochloric Acid 10%	Isopropyl Alcohol
Phosphoric Acid 5%	Crude Oil
Citric Acid 10%	Deionized Water
Battery Acid	Sea Water
Ammonium Hydroxide 29%	Hydraulic Fluid
Sodium Hydroxide 50%	Xylene

4. SUBSTRATE PREPARATION

4.1 Concrete: The concrete surface must be thoroughly clean, dry and free from any surface contaminates or cleaning residue. Acceptable methods of cleaning are shot blasting or mechanical grinding followed by the complete and thorough removal of the resulting residue.

4.2 Cracks: Cracks or non-moving control joints shall be routed out to ¼ inch minimum in width and depth and filled flush with TUFFLEX base membrane and imbedded with polyester reinforcing fabric.

4.3 Surface: Surfaces to receive coves or base coats shall be strong, durable, dry and free of contaminants. Surfaces with weak backings, such as drywall or plaster, are not acceptable unless reinforced with lath.

4.4 Joints: All expansion and contraction joints shall be cleaned, primed, fitted with a backing rod and caulked with elastomeric polyurethane sealants. Expansion joints ½ inch or less in width and all cracks shall be stripe-coated with a 20 mil preparatory coat of TUFFLEX RBC "TUFF" and imbedded with polyester reinforcing fabric. Do not apply this waterproof coating system over joints greater than ½ inch wide.

4.5 Priming: Stir each side of the TUFF-POXY #1 Epoxy Primer separately and then mix 2 parts of Component A with 1 part of Component B. Use a mixing paddle on a slow speed drill motor. Mix for 2 to 3 minutes and then immediately apply the primer.

5. APPLICATION OF MEMBRANE

Mixing and application shall be in strict accordance with the latest printed instructions of TUFFLEX. It is recommended that the waterproof coating system be installed when the temperature of the concrete floor is above 50° F and the ambient temperature is not less than 50° F and rising. Areas to receive the primer and waterproofing coatings should be well ventilated. Mechanics should wear rubber gloves and a face shield or goggles should be used during mixing operations.

5.1. Priming: All concrete substrates will require priming with one coat of TUFF-POXY #1 Epoxy Primer. Apply primer by using a medium-nap roller. Allow primer to dry until it becomes tacky (3 to 16 hours depending upon ambient temperature and humidity) before applying the TUFFLEX RBC "TUFF" Base Coat. For proper primer penetration, apply at a rate of 300- 400 square feet per mixed gallon.

5.2 Base Membrane: Apply the properly mixed and catalyzed TUFFLEX RBC"TUFF" Base Membrane Mixture (BMM) onto the properly prepared and primed floor surface with a notched trowel or squeegee. Immediately backroll with a short to medium nap roller. Apply at the minimum rate of 30-40 square feet per gallon in order to obtain a minimum membrane thickness of 40 mils. Immediately broadcast the texturing agent.

When the base membrane will accept foot traffic, remove all excess texture with broom and/or vacuum. Light sanding with a wood block may be desirable. Make any repairs necessary to imperfections or defects. Let repairs cure before applying the TUFFLEX 7059 Top Coat.

5.3 Top Coat: Thoroughly mix one complete kit consisting of all of the TUFFLEX 7059 Top Coat Part B with the Part A and dump the entire mix onto the floor surface and spread uniformly and tightly with a flat trowel or squeegee. Backroll with a short to medium nap roller. Apply at the approximate rate of 125 square feet per mixed gallon in order to obtain an average topcoat thickness of 12 mils. Immediately and uniformly broadcast the 30-60 or 20-40 mesh aggregate into the wet top coat at the rate of 25 to 35 lbs. per 100 square feet. *Note:* It is always recommended that the proper quantity and proper size of aggregate is applied. *Caution*: The mixed TUFFLEX 7059 Top Coat has a short 20 to 30 minute pot life once mixed and kept in the bucket.

5.4 Top Coat: After a 16 to 24 hour cure remove excess or unbonded aggregate. Apply a second application of top coat by thoroughly mixing one complete kit consisting of all of the TUFFLEX 7059 Top Coat Part B with the Part A and dump the entire mix onto the floor surface and spread uniformly with a notched trowel or squeegee. Apply at the approximate rate of 125 square feet per mixed gallon in order to obtain an average topcoat thickness of 12 dry mils. Backroll with a short to medium nap roller.

5.5 Curing: Allow the top coat to cure 24-36 hours at 75° F before subjecting the floor to light traffic.

5.6 Thickness: The overall dry film thickness of the completed waterproofing system, excluding aggregate, shall be a minimum of 64 mils. Note: This waterproof coating system is not designed to be installed without the proper quantity and the uniform application of properly sized silica or quartz aggregate.

6. MAINTENANCE

The mechanical equipment waterproof flooring system should be cleaned with a free-rinsing, non-abrasive detergent as often as necessary following recommended practices of the maintenance industry. Tar, chemical or mineral deposits and scuff marks should be removed by wiping with isopropyl alcohol or a commercial grade water-based cleaner. Greater slip-resisting characteristics can be obtained by increasing the size of the aggregate. However, increasing the textured qualities of the waterproof flooring system also increases the maintenance efforts to remove dirt and film residue.

7. 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 their customary and standard installation guarantee covering defects in material and workmanship.

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

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

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