INSTALLATION SPECIFICATION

UREA-TUFF SYSTEM 4200-PT

TWO COMPONENT, FAST CURING, PEDESTRIAN TRAFFIC DECK COATING SYSTEM

1. GENERAL

1.1 Scope: This specification covers the installation of a liquid applied, abrasion resistant elastomeric polyurea-polyurethane deck coating system suitable for surfaces subject to demanding environmental exposure and pedestrian traffic. It is a monolithic system, designed to seal the concrete slabs from deicing salts and moisture penetration during freeze-thaw cycling and high temperature, high humidity thermal cycling. These elastomeric polyurethane traffic coatings demonstrate excellent adhesion, impact resistance and abrasion resistance, while ensuring a rapid and complete cure.

1.2 Work Included: Install waterproofing consisting of caulking and flashing for joints, TUFF-POXY #3 Epoxy Primer, UREA-TUFF 4260 fast curing Base Membrane, UREA-TUFF 4270 fast curing Intermediate Coat and UREA-TUFF 4290 Aliphatic, Weather-Resistant Polyurea-Polyurethane Top Coat. Apply in accordance with these specifications and latest general instructions supplied by TUFFLEX Polymers (TUFFLEX).

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 is recommended), of adequate design and thickness for pedestrian traffic, and shall have a steel troweled followed by a fine broom finish, free of fins, ridges, voids or air entrained holes.
1.42 Concrete shall be cured by water curing method or pure sodium silicate water solution. Curing compounds or curing agents of any other type shall not be used unless they have prior approval from TUFFLEX.
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 form, 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 Condition of Plywood Surfaces:

1.51 The plywood shall be identified as conforming to U.S. Product Standard PS 1-66 and shall be ¾ inch minimum thickness, tongue and groove, exterior grade B/C, or better. Install with B side up.
1.52 The tongue and groove plywood panels shall be tightly fitted while leaving 1/16 inch separation between panels.
1.53 Plywood shall be fastened with non-corroding screws, 10d annular ring nails or twist shank nails. Space fasteners 6 inches on center along panel edges and 8 inches on center over intermediate supports.
1.54 All decks shall be designed to eliminate vertical deflection by the proper selection of plywood thickness and the proper spacing and thickness of supporting joists.
1.55 All plywood edges must be supported on blocking or primary framing with plywood panels continuous across two or more spans.
1.56 All adjacent metal flashing, scuppers, vents, etc. shall be galvanized or non-ferrous metal tightly screwed or nailed with ring shank nails, at intervals no greater than 4 inches on center.
1.57 The plywood deck shall be properly sloped so as to freely drain.

1.6 Job Conditions:

1.61 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.
1.62 Do not proceed with application of materials when deck temperatures are less than 40°F or if precipitation is imminent.
1.63 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.
1.64 All gas flames and electrical apparatus shall be shut down prior to the start of and during coating application and curing.
1.65 Protect plants, vegetation, and animals which might be adversely affected by the coating operation.
1.66 TUFFLEX Elastomeric Coating Systems should not be installed onto on-grade slabs, onto split slabs with buried membrane or onto slabs over unvented metal pans without prior approval from TUFFLEX.

2. QUALIFICATIONS

2.1 Factory Qualified Applicator:

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 TUFFLEX.
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 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 TUFFLEX.
3.1 Caulking Compound: Shall be a one-component or two-component polyurethane compound approved by TUFFLEX.
3.2 Flashing Reinforcement: Shall be non-staining, uncured neoprene sheet at 45-60 mils thickness, woven polyester reinforcing fabric, or as recommended by TUFFLEX POLYMERS (TUFFLEX).
3.3 Primer: Shall be TUFF-POXY #3 (low VOC) or TUFF-POXY #1 (solvent free) Epoxy-Polyamine, low viscosity, two-component primer-sealer.
3.4 Base Membrane: Shall be UREA-TUFF 4260 two-component, solvent-free, high adhesion, elastomeric polyurethane membrane and shall meet or exceed the following typical properties:

UREA-TUFF 4260 Base Membrane

PROPERTY	TYPICAL VALUE	TEST METHOD
Composition	Aromatic Polyurethane	
Pot Life	15-25 Minutes	
VOC Content (Mixed)	Less than 20 gm/l	
Hardness, Shore A	63 ± 3	ASTM D-2240
Tensile Strength	1600 ± 200 psi	ASTM D-412
Ultimate Elongation	650 ± 100%	ASTM D-412
Tear Resistance	225 ± 25 pli	ASTM D-1004
Bond Strength To Primed Concrete	400 psi	ASTM D-903 ASTM-D-4541

TUFFLEX POLYMERS ♦ 10880 Poplar Avenue ♦ Fontana, California 92337
Phone: (909) 349-2016 ♦ (888) TUFFLEX ♦ Fax: (909) 823-6309

3.5 Intermediate Coat: Shall be UREA-TUFF 4270 two-component, solvent-free, high adhesion, elastomeric polyurethane membrane and shall meet or exceed the following typical properties:

UREA-TUFF 4270 Intermediate Coat

PROPERTY	TYPICAL VALUE	TEST METHOD
Composition	Aromatic Polyurethane	
Pot Life	15-20 Minutes	
VOC Content (Mixed)	Less than 20 gm/l	
Hardness, Shore A	73 ± 3	ASTM D-2240
Tensile Strength	2000 ± 200 psi	ASTM D-412
Ultimate Elongation	600 ± 100%	ASTM D-412
Tear Resistance	250 ± 25 pli	ASTM D-1004
Bond Strength to Primed Concrete	400 psi	ASTM D-903 ASTM-D-4541

3.6 Traffic Resistant Top Coat: Shall be UREA-TUFF 4290 high tensile strength, low VOC, fast curing aliphatic polyurea-polyurethane coating and shall meet or exceed the following typical properties:

UREA-TUFF 4290 Aliphatic Top Coat

PROPERTY	TYPICAL VALUE	TEST METHOD
Composition	Aliphatic Polyurea-Polyurethane	
Pot Life	30-40 Minutes	
Solids Content	80% ± 2	
VOC Content (Mixed)	Less than 100 gm/l	
Colors	Several Standard Colors	
Hardness, Shore A	90 ± 5	ASTM D-2240
Tensile Strength	3750 ± 400 psi	ASTM D-412
Ultimate Elongation	200 ± 50%	ASTM D-412
Tear Resistance	350 ± 50 lb./in.	ASTM D-1004
Weather Resistance	No Chalking @ 2000 hrs.	ASTM D-822
Abrasion Resistance	Negligible Change, CS- 17 wheels, 1000 cycles, 1000 gm. load	ASTM C-501
Peel Adhesion to Base Membrane	30 pli	ASTM D-903

3.7 Aggregate: Shall be rounded, non-angular, blended 20/40 mesh or 16/30 mesh flint shot silica, or equivalent washed and kiln-dried aggregate. Aggregate shall be hard and stable to anticipated use conditions.

4. SUBSTRATE PREPARATION

4.1 Concrete Surfaces:

4.11 The concrete surface must be thoroughly clean, dry and free from any surface contaminates or cleaning residue. Acceptable methods of cleaning are shot-blasting, sandblasting, or mechanical grinding 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 a 4 inch wide by 25 mils thick detail coat of UREA-TUFF 4260.
4.14 Apply a ¾ inch cant of polyurethane 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 25 mil preparatory coat of UREA-TUFF 4260.
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 Plywood Surfaces:

4.21 Sweep all plywood joints clean and free of sawdust. Fill all separations over 1/16 inch in width with polyurethane sealants. Apply joint reinforcement consisting of a brush coat UREA-TUFF 4260 Base Membrane 25 mils thick, 5 inches wide, centered over all joints and transitions to metal flashings.. Imbed 3 to 4 inch wide TUFFLEX reinforcing fabric into the wet membrane. Allow detail membrane to cure overnight or until firm.
4.22 Damaged plywood panels shall be repaired or replaced prior to coating.

4.3 Flashing Reinforcement:

4.31 All required metal or neoprene flashing and fabric flashing reinforcement and all sealant cants shall be installed at this time.
4.32 All metal shall be delivered shop primed and then be field primed with TUFF-POXY #3 Epoxy Primer prior to coating with the base membrane. (Galvanized and other metal surfaces which may exhibit adhesion difficulties must first be primed with a zinc rich marine primer.)
4.33 UREA-TUFF 4260 Base Membrane is used as an adhesive for the polyester reinforcing fabric. The reinforcing fabric shall be laid relaxed, smooth and wrinkle-free and thoroughly embedded in the Base Membrane.
4.34 Flashing and polyester reinforcing fabric and membrane shall be coated (with base coats and top coats) each time the deck is coated.

4.4 Priming: Stir each side separately and then mix all of Part A with all of Part B for 2 to 3 minutes. Use a mixing paddle on a slow speed drill motor.

5. APPLICATION OF MEMBRANE

5.1 Primer: Apply TUFF-POXY #3 Epoxy Primer at the approximate rate of 300-350 square feet per gallon. Allow primer to dry until it is tack-free, but not yet hard or glazed. Within 8 hours of application of the primer, the base coat must be applied. If the base coat can't be applied within 8 hours or if the primer is contaminated by rain, then reprime with a light coat of solvent diluted primer.

5.2 UREA-TUFF 4260 Base Membrane: shall be trowel or squeegee applied followed by backrolling in one uniform coat at the rate of 64 sq. ft. per gallon or as needed in order to obtain a minimum dry film thickness of 25 mils. Allow 4 to 24 hours curing time before applying the intermediate coat. Do not apply coating system over joints greater than ½ inch wide. (If the Base Membrane should become dirty or contaminated, or loose its surface tack, wipe clean with xylene or acetone).

5.3 UREA-TUFF 4270 Intermediate Coat: shall be trowel or squeegee applied, followed by backrolling, in one uniform coat at the rate of one gallon minimum per 133 square feet (12 wet mils). While the coating is still fluid, uniformly broadcast the 20 mesh aggregate at the approximate rate of 35-45 lbs. of aggregate per 100 square feet. Allow 6 to 24 hours curing time before applying the top coat.

5.4 UREA-TUFF 4290 Top Coat: shall be properly mixed and trowel or squeegee applied in one uniform coat at the rate of one gallon minimum per 100 square feet (16 wet mils). While the coating is still fluid, encapsulate the aggregate by backrolling. Allow 24 hours curing time before opening to light traffic.

5.5 Thickness: Excluding the encapsulated aggregate, the Pedestrian Traffic Coating thickness shall average 47 to 49 dry mils.

6. APPLICABLE STANDARDS / SPECIFICATIONS

This Traffic Bearing Coating System is in compliance with applicable Federal EPA VOC regulations and California Regional Air Quality VOC Regulations and does meet the performance requirements of ASTM C-957-87, High Solids Content, Cold Liquid Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface.

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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