INSTALLATION / SPECIFICATION DATA

TUFF-POXY SYSTEM "T"

HEAVY DUTY, TROWEL-APPLIED, EPOXY INDUSTRIAL FLOORING

1. GENERAL

1.1 Scope: This specification covers the installation of a heavy-duty epoxy floor topping designed to resist chemical and mechanical abuse. TUFF-POXY SYSTEM "T" is a seamless epoxy topping which consists of 100% solids, two component epoxy resin binders that are blended with quartz and silica aggregate and trowel-applied to form a ¼ inch (6.25 mm) thick flooring system. TUFF-POXY SYSTEM "T" is an aesthetic, chemical resistant and high traffic resistant flooring surface which is intended for institutional, industrial and commercial use.

1.2 Work Included: Furnish and install the TUFF-POXY SYSTEM "T" **sea**mless flooring consisting of TUFF-POXY 107 Binder and TUFF-POXY 128 Cycloaliphatic Amine-Epoxy Top Coat. The flooring is to be installed to an average 1/4 inch thickness and shall be installed with a 1/8 inch cove base to the height specified. Apply in accordance with the architectural drawings and room finish schedules as shown and the latest 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 surfaces to receive the epoxy flooring system. Nor does it include furnishing and installation of on-grade vapor barriers, metal flashing, curbs, drains, vents, or any other penetration through the floor.

1.4 Condition of Concrete Substrate:

1.41 Concrete shall be of sufficient thickness, clean, crack free, sound and durable (3,000 psi minimum compressive strength recommended) and dry (3% maximum moisture content by mass).

1.42 Concrete shall have been designed and installed to minimize random cracking and slab deflection and to provide sufficient control joints and isolation joints.

1.43 Variation in plane shall not be greater than plus or minus 1/8 inch in 10 feet in any direction. Proper slope to drain must be maintained.

1.44 A "power steel trowel followed by a fine broom" finish is preferred for best results and to minimize surface preparation.

1.45 Concrete must be free of hydrostatic and/or capillary moisture pressure and should not be in direct contact with the ground. An effective vapor barrier under the concrete slab and properly engineered soil are required. If in doubt, a rubber mat test in accordance with ASTM D-4263 or a RMA calcium chloride moisture test must be conducted and results evaluated.

1.46 Allow new concrete slabs to cure 28 days minimum before applying the seamless flooring.

1.47 Sealers, hardeners, wax and other curing compounds shall not be used on concrete surfaces which are to receive this seamless flooring.

1.5 Temporary Services by General Contractor: Temporary electrical service, adequate hoisting where necessary, and water for installer's use shall be provided at no cost by the General Contractor to the installer. Adequate heat, without flame, to maintain a room temperature of not less than 70° F shall be provided 24 hours prior, during and after completion of the work at no cost to the installer.

1.6 Protection:

1.61 During work, protect all surfaces of other trades against damage from work specified in this Section.

1.62 No smoking, open flame, or sparking from electrical outlets, telephone and electrical motors shall be allowed in area of application.

1.63 Allow no traffic on the seamless flooring for 24 hours, then only light traffic for 48 hours thereafter. The General Contractor shall be responsible for installing and maintaining protection of surfaces after final coats and/or tests.

2. QUALIFICATIONS

2.1 Professional Installer:
2.11 Shall be experienced in successfully applying the same or similar polyurethane waterproofing materials and shall be properly licensed for this type of work.
2.12 Shall be financially responsible and be ready and able to submit payment bonds and project guarantees as 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 2 ½" X 4" in size, showing the approximate applied thickness, texture and color. The submittal shall also include the manufacturer's installation-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, aggregate, binders, thickeners, texturing agents and reinforcing materials, 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 Epoxy Resin Binder: Shall be TUFF-POXY 107, a low viscosity, two component, 100% solids, unfilled epoxy resin system and shall meet or exceed the following typical performance properties.

TUFF-POXY 107 Epoxy Binder

PROPERTY	*TYPICAL VALUE*	*TEST METHOD*
Tensile Strength	6,500 psi	ASTM D- 638
Tensile Elongation	2.5%	ASTM D- 638
Hardness (Shore D)	80	ASTM D-2240
Compressive Strength, Binder	10,900 psi	ASTM C-579
Compressive Strength, Mortar	9,200 psi	ASTM C-579
Water Absorption	0.2%	ASTM C-413
Impact Resistance, Mortar	Passes	MIL D-24613
Bond Strength	350 + psi	ASTM C-882
System Flammability	Self-Extinguishing	ASTM D-635

3.2 Epoxy Seal Coat: Shall be TUFF-POXY 128, a medium viscosity, two-component, chemical resistant and abrasion resistant, cycloaliphatic amine modified epoxy resin system and shall meet or exceed the following typical performance properties:

TUFF-POXY 128 Top Coat

PROPERTY	*TYPICAL VALUE*	*TEST METHOD*
Tensile Strength	7,500 psi	ASTM D-638
Tensile Elongation	2.1%	ASTM D–638
Hardness (Shore D)	83	ASTM D-2240
Compressive Strength	11,200 psi	ASTM D-695
Compressive Strength, Mortar	10,000 psi	ASTM C-695
Water Absorption	0.2%	ASTM C-413
Flexural Strength	9,400 psi	ASTM D-790
Flexural Modulus	305,000 psi	ASTM D-790
Bond Strength	350 +psi	ASTM C-882
Abrasion Resistance, CS-17 wheels	0.035 gm loss	ASTM D-4060

3.3 Reinforcing Aggregate: Shall be ceramic-fired quartz granules and/or selected natural silica sands or aggregates, as specified. All aggregates shall be graded or sized, fresh water washed, kiln-dried and dust free. Aggregates shall be hard and stable to the anticipated traffic conditions.

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3.4 Chemical Resistance: TUFF-POXY SYSTEM "T" has excellent resistance to intermittent contact at room temperature with the following chemicals:

Sulfuric Acid 50%	Bleach
Hydrochloric Acid 10%	Butyl Alcohol
Phosphoric Acid 10%	Crude Oil
Citric Acid 10%	Deionized Water
Battery Acid	Sea water
Ammonium Hydroxide 29%	Skydrol
Sodium Hydroxide 50%	Xylene

For additional details on specific chemical resistance, please contact the TUFFLEX Technical Service Department.

4. SUBSTRATE PREPARATION

4.1 The concrete surface must be thoroughly cleaned by shot blasting, acid-etching or mechanical grinding, followed by the complete and thorough removal of the resulting residue.

4.2 If Acid etching is used, apply a solution of 1:1 muriatic acid and water at the rate of 2 gallons solution per 100 square feet. Scrub with a stiff broom or mechanical scrubber. Neutralize with a solution of ammonia or TSP in water and give a final rinse by flushing with fresh water using a high pressure washer (2500 psi minimum).

4.3 Cracks or non-moving control joints shall be routed out to ¼ inch minimum in width and depth and filled flush with high hardness elastomeric caulking and imbedded with polyester reinforcing fabric.

4.4 Surfaces to receive coves or base 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.

5. APPLICATION

Application shall be in strict accordance with the latest printed instruction of TUFFLEX. No more material shall be pre-mixed than can be easily applied under the specific temperature and pot life conditions. The epoxy flooring system shall be installed when the temperature of the concrete floor is above 40° F and the ambient temperature is not less than 50° F. Artificial heat may be used to raise the temperature prior to the priming operation. Areas to receive the primer and epoxy flooring shall be well ventilated. Mechanics shall wear rubber gloves and use protective cream on exposed skin (face and hands). Goggles should be provided for mixing operations.

5.1 All concrete substrates will require priming with one coat of TUFF-POXY 107 epoxy primer. Apply primer by using a medium nap roller or rubber squeegee. For proper primer penetration, the mixed TUFF-POXY 107 may need to be thinned at a rate of 5% to 20% with toluene (or as local VOC regulations allow). Apply at a rate of 250-350 square feet per mixed gallon.

5.2 Pour 2 gallons of TUFF-POXY 107 Part A Resin into a clean 5 gallon pail. Add 1 gallon of TUFF-POXY 107 Part B Curing agent to the Resin. Using a drill and Jiffy mixer, stir for 30-60 seconds and then scrape sides and bottom of pail. Mix for approximately 3 minutes using a ¾ inch 375 rpm drill and paddle.

5.3 Transfer the mixed TUFF-POXY 107 Binder to a wheel barrel or cement mixer. Add 200-300 lbs. of the preblended aggregate and thoroughly mix until a uniform mortar is obtained.

5.4 Immediately spread the epoxy and aggregate mortar into the area of the primed floor. Start work against a wall or divider strip. Screed the material to its desired thickness and then trowel the mix tightly into place. Trowel lubricant may be needed. Coverage at ¼ inch thickness is approximately 6 square feet per gallon of binder and aggregate mortar.

5.5 Allow the floor to cure until firm (a minimum of 16 hours at 77° F). Scrape floor firmly with edge of trowel to remove projecting or loose granules of aggregate. Sweep or vacuum to remove debris. (Smoother floors can be obtained by using a floor disc sander to remove all high spots or trowel marks. Selected hand sanding should be employed at base and tight spots. Remove all sanding dust by vacuuming.)

5.6 The floor should be grouted with TUFF-POXY 128 Grout Coat. Apply the mixed TUFF-POXY 128 Epoxy Grout with a trowel while maintaining a constant "puddle" in order to get a better fill. This "follow-on" method will help keep track of the area which has been grouted. A short nap, phenolic core mohair roller should be used to produce a uniform surface and the rolling should be done as you move along with the trowel. Sprinkle and thoroughly imbed the wet grouting with the selected gradation of skid-resistant aggregate. Allow to cure overnight.

5.7 The coverage of the TUFF-POXY 128 Epoxy Grout on a tightly troweled epoxy mortar is approximately 125-175 square feet per gallon.

5.8 The floor must be top coated with TUFF-POXY 128 Seal Coat. Combine 2 parts of TUFF-POXY 128 Part A Pigmented Resin, with 1 part of TUFF-POXY 128 Part B Curing Agent. Mix thoroughly, using a low speed electric drill with a Jiffy mixer and by raising and lowering the mixer and working around the sides of the container for 60-90 seconds. Use a separate spatula to scrape the sides and bottom. Continue mixing for approximately 3 minutes. Be careful not to beat in and entrap air.

5.9 Pour the mixed seal coat onto the floor in a "puddle" and spread with a trowel or squeegee. This method provides proper filling of the surface. Pass a short nap, mohair roller over the wet surface to produce a uniform surface appearance. Excessive rolling may result in color variation. Pass roller across and back and do not overwork. To extend the working time of the mixed coating, it is advisable to pour the mix into a shallow pan to prevent heat buildup.

5.10 Epoxy Top Coat should be applied at a rate of approximately 125-175 square feet per gallon. Coverage will vary depending on porosity of the surface, finishing techniques and the degree of texture that is supplied by the skid-resisting aggregate.

5.11 Allow the floor to cure 24 hours (at a constant temperature of 77°F or above) before subjecting to light traffic.

6. MAINTENANCE

The Epoxy Seamless Floor 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 with xylene or isopropyl alcohol. When greater slip-resisting characteristics are needed, increasing the textured qualities of the chemical flooring also increases the maintenance efforts to remove dirt and film residue.

7. GUARANTEE / WARRANTY

When this Seamless Epoxy Flooring System is installed by a Professional Installer, is inspected and approved in accordance with these specifications, and after receipt of the final payment, the Professional Installer shall issue their customer 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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