



INSTALLATION SPECIFICATION

TUFF-POXY SYSTEM "S-HD"

HEAVY DUTY, SEEDED, EPOXY INDUSTRIAL FLOORING

1. GENERAL

1.1 Scope: This specification covers the installation of a chemical resistant epoxy topping which consists of 100% solids epoxy resin combined with a cycloaliphatic amine hardener and properly sized quartz aggregate to form a minimum 1/8 inch thick self-leveling "seeded" flooring system. TUFF-POXY SYSTEM "S-HD" cures completely at ambient temperature to form an acid and alkali resistant topping which is intended for use in institutional, industrial and commercial facilities. This system is suitable for heavy traffic and moderate fork lift traffic.

1.2 Work Included: Furnish and install the TUFF-POXY SYSTEM "S-HD" seamless flooring consisting of TUFF-POXY 107 Epoxy Primer and Tuff-Poxy 128 Cycloaliphatic Amine Epoxy Aggregate Binder and Top Coat as manufactured by TUFFLEX Polymers. The flooring is to be installed to an average 1/8 inch thickness and shall be installed as a covered 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 Polymers (TUFFLEX).

1.2 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.

1.3 Condition of Concrete Substrate:

1.41 Concrete shall be of sufficient thickness and 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 must be maintained.

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

1.44 Concrete shall be clean, crack free, sound and durable (3,000 psi compressive strength) and dry (recommended 9% maximum moisture content.) Concrete shall be free of fins, ridges, voids or air-entrained holes.

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 and properly engineered soil are required. If in doubt, a rubber mat test in accordance with ASTM D-4263 or a RMC 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, wax or resinous curing compounds shall not be used on concrete surfaces which are to receive this flooring system.

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. Warn installation mechanics against breathing of vapors and contact of material with skin or eyes.

1.62 No smoking, gas flames, or sparking from electrical outlets, telephones or electrical motors shall be allowed in area of application.

1.63 Allow no light foot traffic on the seamless flooring for 24 hours after completion. The General Contractor shall be responsible for installing and maintaining protection of surfaces after final coats and until final acceptance.

2. QUALIFICATIONS

2.1 Professional Installer:

2.11 Shall be experienced in successfully applying the same or similar materials.

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 necessary certificates of insurance prior to starting the project.

2.14 Samples Submittals: Submit samples not less than 2 1/2 " 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, seal coats, thickeners, 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 Primer: 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

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 Binder and Seal Coat: Shall be TUFF-POXY 128, a self-leveling, two components, 100% solids, chemical resistant Cyclo-Aliphatic epoxy resin system and shall meet or exceed the following typical performance properties.

TUFF-POXY 128

Property	Typical Value	Test Method
Tensile Strength	7500 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 a blend of properly sized aluminum oxide, quartz granules or flint shot silica as supplied or approved by TUFFLEX. The granules shall be fresh water washed, kiln-dried, graded or sized, dust free and shall be hard and stable to the anticipated use conditions.

3.4 Chemical Resistance: TUFF-POXY SYSTEM “S-HD” has excellent resistance to spillage and intermittent contact at room temperature with the following chemicals:

Sulfuric Acid 10%	Bleach
Hydrochloric Acid 5%	Butyl Alcohol
Phosphoric Acid 5%	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). The resulting prepared surface must be equivalent to light shot blasting.

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 instructions of TUFFLEX. The epoxy flooring system shall 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 epoxy flooring should be well ventilated. Mechanics shall wear rubber gloves and goggles or face shield should be used during mixing operations.

5.1 Most concrete substrate conditions 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 10% with toluene (or as Local VOC Regulations allow). Apply at a rate of 250-350 square feet per mixed gallon. Allow the TUFF-POXY 107 to cure until it is firm.

5.2 Mix the TUFF-POXY 128 Aggregate Binding Epoxy at the ratio of two gallons of Part A to one gallon of Part B. Immediately spread all of the mixed TUFF-POXY 107 epoxy binder onto the designated area of the properly prepared floor with a 1/16 inch notched trowel or squeegee. Backroll with a short nap roller. Apply at the approximate rate of 80 to 100 square feet per gallon of mixed material.

5.3 Allow the TUFF-POXY 128 epoxy aggregate binder to briefly level and immediately sprinkle the reinforcing aggregate into the wet binder at the approximate rate of 50-60 lbs. per 100 square feet. Carefully sprinkle the aggregate until the binder is completely covered and no wet binder is visible.

5.4 NOTE: Wear spiked shoes during this operation. Do not mix size of aggregate granules. Sprinkle at least one foot back from areas where there will be adjoining pours of binder.

5.5 Allow the epoxy resin flooring to cure until firm. Sweep or vacuum excess granules. Scrape floor firmly with edge of trowel to remove loose granules. Re-sweep or re-vacuum to remove debris.

5.6 Install another application of TUFF-POXY 128 epoxy aggregate binder and reinforcing aggregate by repeating steps 5.2, and 5.3.

5.7 Allow the floor to cure until firm (approximately 24 hours at 75° F). Sweep or vacuum excess granules. Scrape floor firmly with edge of trowel to remove projecting or loose granules. Re-sweep or vacuum to remove debris. (Smoother floors can be obtained by using a floor disc sander to lightly remove high spots. Selected hand sanding should be employed at base and tight spots. Remove all sanding dust by vacuuming and wipe floor clean.) The rougher the surface the more sealer coat will be required.

5.8 Apply a sealer coat of TUFF-POXY 128. Thoroughly mix the TUFF-POXY 128 and spread uniformly over the entire floor surface with flat trowels, squeegees, or rubber grouting-floats. Keep a puddle or “head” of sealer in front of the tool. Draw or pull sealer down tight. Always reroll wet sealer with short napped rollers, rolling in all directions to insure even application. Coverage of the sealer coat will vary due to finishing techniques, the size and porosity of aggregate, and also will be dependent upon the degree of texture that is desired. Typical installations will average 100 to 125 square feet per gallon.

5.9 Allow the floor to cure 24 hours at 77° F 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 resistant flooring also increases the maintenance efforts to remove dirt and film residue.

7. GUARANTEE / WARRANTY

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

TUFF-POXY “S-HD” (09)