SECTION 09 67 23-RESINOUS FLOORING v2
HYBRI-FLEX ReFLEXions

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the following:

1. Resinous flooring system as shown on the drawings and in schedules.

B. Related sections include the following:

1. Cast-in-Place Concrete, section 03 30 00
2. Concrete Curing, section 03 39 00

1.3 SYSTEM DESCRIPTION

A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with quartz aggregate broadcast, epoxy self-leveling topcoat and urethane topcoat.
B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 3/16 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
C. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted

1.4 SUBMITTALS

A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
B. Manufacturer’s Safety Data Sheet (SDS) for each product being used.
C. Samples: A 3 x 3 inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

1.5 QUALITY ASSURANCE

A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
C. No requests for substitutions shall be considered that would change the generic type of the specified System.
D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
E. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.
F. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping
   1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.

B. Storage and Protection

   1. The Applicator shall be provided with a dry storage area for all components. The area shall be between 60 F and 85 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
   2. Copies of Safety Data Sheets (SDS) for all components shall be kept on site for review by the Engineer or other personnel.

C. Waste Disposal

   1. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.7 PROJECT CONDITIONS

A. Site Requirements

   1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
   2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
   3. The Applicator shall ensure that adequate ventilation is available for the work area. This shall include the use of manufacturer’s approved fans, smooth bore tubing and closure of the work area.
   4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

   1. Concrete shall be moisture cured for a minimum of 3 days and have fully cured a minimum of 5 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
   2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
   3. Sealers and curing agents should not to be used.
   4. Concrete shall have minimum design strength of 3,500 psi. and a recommended maximum water/cement ratio of 0.45
   5. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements

   1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
   2. "No Smoking" signs shall be posted at the entrances to the work area.
   3. The Owner shall be responsible for the removal of foodstuffs from the work area.
   4. Non-related personnel in the work area shall be kept to a minimum.

1.8 WARRANTY

A. Dur-A-Flex, Inc. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to Dur-A-Flex, Inc. published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
B. Dur-A-Flex, Inc. liability with respect to this warranty is strictly limited to the value of the material purchase.

PART 2 – PRODUCTS

2.1 FLOORING

A. Dur-A-Flex, Inc, Hybri-Flex ReFLEXions (self leveling cementitious urethane broadcast quartz), epoxy/aliphatic urethane topcoat seamless flooring system.

1. System Materials:
   a. Primer: Poly-Crete TF Plus resin, hardener and TF Plus filler.
   b. Topping: Dur-A-Flex, Inc. Poly-Crete SL resin, SL hardener and SL aggregate.
   c. The broadcast aggregate shall be Dur-A-Flex, Inc. F-60 quartz aggregate.
   d. Body coat: Dur-A-Flex, Inc. Shop Floor pigmented epoxy resin and hardener.
   e. Grout coat: Dur-A-Flex, Inc. Dur-A-Glaze #4 resin and hardener with ReFLEXions effect pigment.
   f. Topcoat: Dur-A-Flex, Inc. Armor Top Satin Finish resin and hardener.

2. Patch Materials
   a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete MD (up to ¼ inch).
   b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Poly-Crete WR.

2.2 MANUFACTURER

A. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802
B. Manufacturer of Approved System shall be single source and made in the USA.

2.3 INSTALLER

A. Northwest Floor Care, Inc. 2920 Malmo Drive, Arlington Heights, IL 60005, Phone (847) 640-0390, Fax: (847) 640-1050 Contact: Jim Muzzillo Jr., email: jmuzzillojr@northwestfloor.com

2.4 PRODUCT REQUIREMENTS

A	Primer	Poly-Crete TF Plus
1.	Percent Reactive	100 %
2.	VOC	0 g/L
3.	Bond Strength to Concrete ASTM D 4541	400 psi, substrates fails
4.	Compressive Strength, ASTM C 579	7,250 psi
5.	Tensile Strength, ASTM D 638	750 psi
6.	Flexural Strength, ASTM D 790	4,400 psi
7.	Hardness, ASTM D 2240 (shore D)	85
8.	Abrasion Resistance, ASTM C 501 Taber H 10 wheel, 1,000 gm load, 1,000 cycles	900 mg loss
B.	Topping	Poly-Crete SL
1.	Percent Reactive	100 %
2.	VOC	0 g/L
3.	Compressive Strength, ASTM C579	7,250 psi
4.	Tensile Strength, ASTM D 638	750 psi
5.	Flexural Strength, ASTM D 790	4,400 psi
6.	Impact Resistance @ 125 mils, MIL D-3134,	160 inch lbs No visible damage or deterioration

C. Body Coat — Dur-A-Glaze Shop Floor

1. VOC	7.9 g/L
2. Compressive Strength, ASTM D 695	17,500 psi
3. Tensile Strength, ASTM D 638	4,000 psi
4. Flexural Strength, ASTM D 790	6,250 psi
5. Flexural Modulus of Elasticity, ASTM D 790	6.2 x 10^5
6. Abrasion Resistance, ASTM D 4060	
C-10 Wheel, 1,000 gm load, 1,000 cycles	24 mg loss
7. Flame Spread/NFPA-101, ASTM E 84	Class A
8. Flammability, ASTM D 635	Self Extinguishing
9. Indentation, MIL D-3134	0.025 Max
10. Impact Resistance MIL D-3134	Pass
11. Water Absorption. MIL D-24613	0.04%

D. Grout Coat — Dur-A-Glaze #4 w/ReFLEXions

1. Percent Solids	100 %
2. VOC	3.8 g/L
3. Compressive Strength, ASTM D 695	17,500 psi
4. Tensile Strength, ASTM D 638	2,100 psi
5. Flexural Strength, ASTM D 790	5,100 psi
6. Abrasion Resistance, ASTM D 4060	
C-10 Wheel, 1,000 gm load, 1,000 cycles	29 mg loss
7. Flame Spread/NFPA-101, ASTM E 84	Class A
8. Impact Resistance MIL D-24613	0.0007 inches, no cracking or delamination
9. Water Absorption. MIL D-24613	Nil
10. Potlife @ 70 F	20 minutes

E. Topcoat — Armor Top

1. VOC	0 g/L
2. 60 Degree Gloss ASTM D523	50 (+/- 10) Satin finish
3. Tensile strength, ASTM D 638	7,000 psi
4. Abrasion Resistance ASTM D-460 CS 17 1,000 gm load, 1,000 cycles	12 mg loss
5. Potlife @ 70°F, 50% R.H	2 hours
6. Dry properties, 70°F, 50% R.H.	6-8 hours
7. Hard Dry	12 hours
8. Full Chemical resistance	7 days

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.2 PREPARATION

A. General

1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
2. Moisture Testing: Perform tests recommended by manufacturer and as follows.

. a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.

b. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.
c. If the vapor drive exceeds 99% relative humidity or 20 lbs/1,000 sf/24 hrs then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.

3. Mechanical surface preparation
   a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
   b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
   c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
   d. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

A. General

1. The system shall be applied in six distinct steps as listed below:
   a. Substrate preparation
   b. Primer application
   c. Topping/overlay application with quartz aggregate broadcast.
   d. Body coat application
   e. Grout coat application
   f. Topcoat application.
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Priming

1. The primer shall be applied roller applied at a nominal thickness of 8 mils.
2. The primer shall be comprised of pre-measured kits as supplied by the manufacturer.
3. The primer shall be mixed and applied per the manufacturer's recommendations.

C. Topping

1. The topping shall be applied as a self-leveling system. The topping shall be applied in one lift with a nominal thickness of 1/8 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. SL Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using ½ inch "v" notched squeegee, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a loop roller.

6. F-60 Quartz aggregate shall be broadcast to excess into the wet material at the rate of 0.5 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

D. Body Coat

1. The grout coat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1 part hardener by volume and shall be thoroughly blended by mechanical means such as a high speed paddle mixer.
2. The grout coat shall be squeegee applied with a coverage rate of 100 sf/gal.
3. The grout coat will be back rolled and cross rolled to provide a uniform texture and finish.
4. Allow material to fully cure.

C. Grout Coat

1. The body coat shall be applied as specified by the Architect.
2. The body coat shall be comprised of three components, a resin, and hardener as supplied by the Manufacturer and mixed in the ratio of 2 parts resin to 1 part hardener and ReFLEXions pigment per the manufacturer's instructions.
3. The ReFLEXions pigment shall be added to the resin and mixed by suitably approved mechanical means followed by the addition of the hardener and again mixed.
4. The body coat shall be applied over horizontal surfaces using "v" notched squeegee and back rolled at the rate of 80 sq/ ft per gallon
5. Allow material to fully cure.

E. Topcoat

1. The topcoat shall be roller applied at a thickness of 3 mils.
2. The topcoat will be supplied in pre measured kits from the manufacturer.
3. The topcoat shall be mixed and applied per the manufacturer's recommendations.
4. The finish floor will have a nominal thickness of 3/16 inch.

3.4 FIELD QUALITY CONTROL

A. Tests, Inspection
   1. The following tests shall be conducted by the Applicator:
      a. Temperature
         1. Air, substrate temperatures and, if applicable, dew point.
      b. Coverage Rates
         1. Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.5 CLEANING AND PROTECTION

A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.