Date:01/2014

SECTION 09 67 23-RESINOUS FLOORING
KOSTER COLOR CHIPS (1/4" or 1/16"), MOISTURE MITIGATION PRIMER, SMOOTH, URETHANE TOPCOAT

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. Chips 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 an epoxy based multi-roller applied floor coating system with a moisture mitigation primer, ¼" or 1/16" colored decorative chips, smooth appearance and urethane topcoat. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/8" thickness. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
B. 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 6 inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system.

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 been approved by the flooring system manufacturer in all phases of surface preparation and application of the product specified.
D. No requests for substitutions shall be considered that would change the generic type of the specified system.
E. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
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 storage area for all components. The area shall be between 60 F and 90 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 90 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
2. The ambient 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.
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 epoxy material.

1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured a minimum of twenty eight 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 or desirable).
3. Sealers and curing agents should not to be used.
4. 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. KOSTER AMERICAN CORP. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to KOSTER AMERICAN CORP.

published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.

B. KOSTER AMERICAN CORP. liability with respect to this warranty is strictly limited to the value of the material purchase.

PART 2 – PRODUCTS

2.1 FLOORING

A. KOSTER AMERICAN CORP. KOSTER Color Chips, Epoxy-Based seamless flooring system

1. System Materials:
   a. Primer: KOSTER AMERICAN CORP. KOSTER VAP 1 2000 Resin and Hardener.
   b. Body Coat: KOSTER AMERICAN CORP. KOSTER MPE Resin and Hardener.
   c. Broadcast: KOSTER AMERICAN CORP. KOSTER Color Chips (1/4" or 1/16").
   d. Grout Coat. KOSTER AMERICAN CORP. KOSTER MPE Resin and Hardener.
   e. Topcoat. KOSTER AMERICAN CORP. KOSTER UTC Resin and Hardener.

2. Patch Materials
   a. Shallow Fill and Patching: Use KOSTER AMERICAN CORP. KOSTER TA with KOSTER VAP 1 2000 Resin and Hardener.
   b. Deep Fill and Sloping Material (over ¼ inch): Use KOSTER AMERICAN CORP. KOSTER MPE filled with natural quartz locally supplied.

2.2 MANUFACTURER

A. KOSTER AMERICAN CORP., 2585 Aviator Drive, Virginia Beach, VA 23453, Phone: (757) 425-1206, Fax: (757) 425-9951

B. Manufacturer of Approved System shall be single source and made in the USA.

2.3 PRODUCT REQUIREMENTS

A. Primer — KOSTER VAP 1 2000

1.	Percent Solids	100%
2.	VOC	0g/l
3.	Compressive Strength, ASTM D695	11,200 psi
4.	Tensile Strength, ASTM D 638	2,100 psi
5.	Flexural Strength, ASTM D 790	5,100 psi
6.	Adhesion Strength, ASTM D 4541	>400 psi, concrete failure
7.	Hardness, ASTM D 2240	80D
8.	Elongation, ASTM D 638	5 %
9.	Flame Spread/NFPA-101, ASTM E 84	Class A
10.	Water Absorption, ASTM D 570	<0.04%
11.	Water Vapor Transmission, lb/1000sft/24hrs, ASTM E 96	0.12

B. Body Coat including Broadcast and Grout Coat — KOSTER MPE

1.	Percent Solids	100%
2.	VOC	0g/l
3.	Compressive Strength, ASTM D 695	17,000 psi
4.	Tensile Strength, ASTM D 638	4,000 psi
5.	Flexural Strength, ASTM D 790	5,500 psi
6.	Adhesion Strength, ASTM 4541	>400psi, Cohesive Failure
7.	Hardness, ASTM D 2240	80D

8.	Abrasion Resistance, ASTM D 4060 CS 17 Wheel, 1,000 gm load, 1,000 cycles	30 mg loss
9.	Flame Spread/NFPA-101, ASTM E 84	Class A
10.	Impact Resistance ASTM D 2794	>160
11.	Water Absorption. ASTM D 570	0.05 %

C. Topcoat KOSTER UTC

1.	Percent Solids	90%
2.	VOC	0g/l
3.	60Degree Gloss, ASTM D 523	94
4.	Tensile Strength, ASTM D 2370	7,000 psi
5.	Cross-Hatch Adhesion, ASTM D 3359	5B
6.	Hardness, ASTM D 3363	3H
7.	Abrasion Resistance, ASTM D 4060 CS 17 Wheel, 1,000 gm load, 1,000 cycles	15 mg loss
8.	Impact Resistance ASTM D 2794	>160
9.	Water Absorption. ASTM D 570	0.05 %
10.	Slip Resistant, Meet ADA, ASTM D 2047 Wet	0.7
11.	Full Chemical Resistant	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 75% relative humidity level measurement.
   c. Slab-on grade substrates without a vapor barrier may also require the moisture mitigation system.
3. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a <u>light</u> passing of a propane torch may be used to dry the substrate.
4. 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 3-4 as described by the International Concrete Repair Institute (ICRI).

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.

5. 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 12 distinct steps as listed below:
   a. Substrate preparation
   b. Priming
   c. Body Coat
   d. Broadcast colored decorative chips into the body coat
   e. Sweep, sand, vacuum loose chips
   f. Body/Grout Coat
   g. Second broadcast colored decorative chips into the body/grout coat
   h. Sweep, sand, vacuum loose chips
   i. Grout coat
   j. Second grout coat.
   k. Third grout coat
   l. Topcoat

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. Primer
1. The primer shall be KOSTER AMERICAN CORP. KOSTER VAP 1 2000 pre-measured kit that is mixed per manufacturer's instructions.
2. The primer coat shall be applied over horizontal surfaces using "v" notched squeegee and back rolled at the rate of 100 sf/gal to yield a dry film thickness of 16 mils.

C. Body Coat with Broadcast
1. The body/broadcast coat shall be applied as a double chips broadcast system as specified by the Architect.
2. The body coat shall be KOSTER AMERICAN CORP. KOSTER MPE comprised of two components, a clear liquid resin and hardener as supplied by manufacturer.
3. Mix 2parts resin and 1part hardener thoroughly by suitably approved mechanical means.
4. The body coat shall be applied over primer coat using a flat squeegee and back rolled at the rate of 300 sf/gal to yield a dry film thickness of 5.5mils.
5. KOSTER Color Chips (1/4") shall be broadcast to excess into the wet body coat at the rate of 0.15 lbs/sf. or KOSTER Color Chips (1/16") at 0.20 lb/sf.
6. Allow material to fully cure. Sweep and/or blow, sand, and vacuum to remove all loose chips.

7. Apply a grout coat of KOSTER MPE over Color Chips at a coverage rate of 200 sf/gal follow by a second KOSTER Color Chips (1/4") shall be broadcast to excess into the wet body coat at the rate of 0.15 lbs/sf. or KOSTER Color Chips (1/16") at 0.20 lb/sf.
8. Allow material to fully cure. Sweep and/or blow, sand, vacuum to remove all loose aggregate.

D. Grout Coat
1. The grout coat shall be KOSTER MPE comprised of two component, a clear liquid resin and a hardener that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
2. The grout coat shall be flat squeegee applied and back rolled with a coverage rate of 200 sf/gal.

E. Second Grout Coat
1. The grout coat shall be KOSTER MPE comprised of two component, a clear liquid resin and a hardener that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
2. The grout coat shall be flat squeegee applied and back rolled with a coverage rate of 200 sf/gal.

F. Third Grout Coat
1. The grout coat shall be KOSTER MPE comprised of two component, a clear liquid resin and a hardener that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
2. The grout coat shall be flat squeegee applied and back rolled with a coverage rate of 200 sf/gal.

G. Topcoat
1. The topcoat shall be KOSTER UTC comprised of two component, a clear liquid resin and hardener as supplied by the manufacturer.
2. Mix 1part resin to 1part hardener thoroughly per manufacturer's instruction.
3. The topcoat shall be flat squeegee applied and back rolled at the rate of 500 sf/gal to yield a dry film thickness of 3mils.

H. KOSTER Color Chips (1/4" or 1/16") with VAP 1 2000, Smooth, Urethane Topcoat
1. This conclude the system. The final finish floor will have a nominal thickness of 1/8 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.