



SECTION 096723

RESINOUS FLOORING

This specification is provided by Düraamen Engineered Products as a service and is intended to be used as a guideline for preparing the appropriate project specific specification sections. Every heading may not be needed. Delete headings not used and renumber remaining used headings to be numerically correct.

PART I GENERAL

1.01 SUMMARY

- A. This section includes the following:
 - i. Resinous flooring system as shown on the drawings and in the schedules

1.02 RELATED SECTIONS

- A. Section 03300 – Cast-in-Place concrete
 - i. Concrete sub-floor to be level (maximum variation not to exceed 1/4inch in 10 feet) and to have steel troweled finish. No curing agents or other additives which would prevent bonding should be used unless the mechanical surface preparation method completely removes the curing agent residue or sealer.
 - ii. Slabs on grade must have an efficient puncture resistant vapor barrier placed directly under the slab.
- B. Concrete Curing, Section 03 39 00

1.03 REFERENCES

- A. ASTM C-307, Test Method for Tensile Strength of Chemical –Resistant Mortars
- B. ASTM C-501, Test Method for Relative Resistance to Wear Unglazed Ceramic Tile by the Taber Abraser
- C. ASTM C-531, Test Method for Linear Shrinkage and Coefficient of Thermal expansion of Chemical-Resistant Mortars, Grouts and Monolithic Surfacing
- D. ASTM C-579, Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfaces
- E. ASTM C-580, Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, grouts and Monolithic Surfaces
- F. ASTM D-570, Water Absorption of Plastics
- G. MIL D-3 134 F, Impact Resistance, Section 4.7.3.
- H. ACI 301, Specifications for Structural Concrete for Buildings (most recent edition). Committee in Concrete 403 bulletin 59-43, Bond Strength to Concrete.

1.04 DEFINITIONS

- A. The resinous flooring system specified under this section is referenced on the drawings as ‘Perdüre UMC – Cementitious Urethane Flooring System”.

1.05 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of a trowel applied cementitious urethane based seamless flooring system
- B. The system shall have the color and texture as specified by the Owner/Architect with a nominal thickness of 1/4in to 3/8in (as specified in the drawings). 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.

1.06 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - i. Surface preparation instructions and recommendations
 - ii. Storage and handling requirements and recommendations
 - iii. Installation methods
- C. Selection samples: Submit 6" X 6" cured samples of flooring system indicating color combination and no-skid properties. Approved samples will be used during installation for product match.
- D. Certified Test: Submit two copies of suppliers/manufacturers written certification that flooring system meets or exceeds required properties.
- E. Shop Drawings: Shop Drawings shall be furnished showing installation of cove base and termination details and details at floor material transitions and where adjoining equipment. Locate and provide detailing for flexible joints required for flooring in area of installation.
- F. Installer's Project References: Submit list of successfully completed projects, including project name and location, name of architect, and type and quantity of decorative concrete floor finish systems applied.
- G. Maintenance Instructions: Submit current copies of the flooring manufacturer's printed recommendations on maintenance methods and products. Submit in accordance with Section 01730 – Operation and Maintenance Manuals.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications:
 - i. Successful experience in application of similar decorative flooring systems.
 - ii. Employ persons trained for application of decorative concrete flooring systems.
 - iii. The special concrete finish manufacturer shall certify applicator.
 - iv. Applicator shall be familiar with the specified requirements and the methods needed for proper performance of work of these sections. Applicator must have availability of proper equipment to perform work within scope of this project on timely basis. Applicator should have successfully performed a minimum of 3 projects of at least 2500ft² each.
 - v. Installer to verify locations of all flexible joints required by the provisions of this Section and by the recommendations of the related material manufacturers.
 - vi. Installer to keep daily log of the date of installation, room number, type, color and method of application of product being installed. Log must be available for inspection by the Architect upon request.
- B. Manufacturer's Certification:
 - i. Provide a letter of certification from concrete finish manufacturer stating that installer is certified applicator of special concrete finishes, and is familiar with proper procedures and installation requirements required by the manufacturer.
- C. Mock-ups: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - i. Finish areas designated by Architect.
 - ii. Do not proceed with remaining work until workmanship, color, and sheen are approved by the Architect.
 - iii. Refinish mock-up area as required to produce acceptable work.
- D. Pre-Installation Conference:
 - i. Conduct conference at project site to comply with requirements in Division 1 Section "Project Management and Coordination".

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.
- B. The installer shall be provided with a storage area for all components. Store materials in dry protected area at a temperature between 60°F to 80°F. Deliver and store materials on site at least 24 hours before work begins.
- C. The Installer shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the flooring system.
- D. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.

1.09 PROJECT CONDITIONS

- A. Maintain the ambient room and the floor temperatures between 50°F and 80°F for a period extending from 72 hours before, during and after floor installation. Concrete to receive surfacing shall have cured for at least 28 days and shall have been free of water for at least 7 days. If the temperature cannot be maintained within the range, consult the Manufacturer.
- B. 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.
- C. Illumination: Apply flooring system only where a minimum of 30 footcandles exist when measured 3ft from surface.
- D. Advise other trades of fixtures and fittings not to be installed until flooring is cured and protected.
- E. Conditions of new concrete
 - i. Concrete shall be moisture cured for a minimum of 7 days and have fully cured a minimum of 28 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
 - ii. Concrete shall have a flat rubbished finish, float or light trowel finish (a hard steel trowel finish is neither necessary nor desirable).
 - iii. Sealers and curing agents should not be used.
 - iv. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against effects of vapor transmission and possible delamination of the system.
- F. Safety Requirements
 - i. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
 - ii. "No Smoking" signs shall be posted at the entrances to the work area.
 - iii. The Owner / Architect shall be responsible for the removal of foodstuffs from the work area.
 - iv. Non-related personnel in the work area shall be kept to a minimum.

1.10 PROTECTION

- A. Protect adjacent surfaces not scheduled to receive the flooring by masking, or by other means, to maintain these surfaces free of the flooring material.
- B. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.
- C. Provide polyethylene or rubber gloves or protective creams for all workmen engaged in applying products containing epoxy, polyurethane or polyaspartic polyurea.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Acceptable Manufacturer & Distributor: Düraamen Engineered Products Inc. with its corporate office located at 924 Bergen Avenue, Unit 103, Jersey City, NJ 07306. Tel: 866.835.6595 | F: 866.629.4157 | Email: info@duraamen.com website: www.duraamen.com
- B. Substitutions: Not permitted
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- D. Obtain products from a single supplier.

2.02 PRODUCTS

- A. Primer/Top coat - Perdüre UMC- CO
- B. Body coat – Three-component, Perdüre UMC – SL or Perdüre UMC-TG
- C. Joint and Crack Fillers: Perdüre EJF, Perdüre ECF

2.03 SYSTEM PROPERTIES

Flammability, ASTM D-635	Self Extinguishing
Fungus & Bacteria Growth, MIL-F-52505-4.4.2.11	Will not support growth of fungus or bacteria when subjected to mildew and bacterial tests
Hardness	85-90 Shore D
Bond strength to Concrete ACI COMM #403, Bulletin 59-43	400psi (100% concrete failure)
Flexural Strength, ASTM C-580	4,000psi
Coefficient of friction, ASTM D-2047	0.80
Water Absorption, ASTM D-570	Nil
Thermal Shock Resistance, ASTM C-84	Passes
Abrasion Resistance, ASTM C-501	32mg
Compressive Strength, ASTM C-579, 7 days	10,000psi
Tensile Strength, ASTM C-307	2,400psi
Density	125-130lb/ft ³
Thermal Coefficient of Expansion, ASTM C-531	2 X 10 ⁻⁵
Cure Time	10-12hr foot traffic / 24hr full service
VOC	Zero

2.04 Finishes

- A. Color as selected by Architect from the manufacturer's standard patterns.

PART 3 EXECUTION

3.01 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.
- B. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.02 PREPARATION

A. General

- i. 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.
- ii. Moisture Testing: Perform anhydrous calcium chloride test ASTM F 1869-98.
 - a. Perform three tests for the first 1,000ft² and then one test per 1000ft² after that.
 - b. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 14lb/1000ft²/24hr.
 - c. If the vapor drive exceeds 14lb/1000ft²/24hr then the Owner and/or Engineer shall be notified and advised of an 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.

- iii. 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 light passing of a propane torch may be used to dry the substrate.
- iv. Mechanical surface preparation
 - a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine. 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 profile of CSP 3-5 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 1/4inch 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 1/8inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
 - e. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and match per manufacturers' recommendations.

3.03 INSTALLATION

A. General

- i. The system shall be applied in three distinct steps as listed below:
 - a. Substrate preparation
 - b. Bodycoat application
 - c. Topcoat application
- ii. 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.
- iii. 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.
- iv. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the architect.
- v. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Body Coat

- i. The topping (Perdüre UMC-SL or Perdüre UMC-TG) shall be trowel applied as specified by the manufacture. The topping shall be applied in one lift with a nominal thickness of 1/4" - 3/8" (as specified by the owner/Architect).
- ii. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
- iii. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. The aggregate shall be added to the resin and thoroughly dispersed by suitably approved mechanical means.
- iv. The topping shall be applied over horizontal surfaces using a screed box, trowels, or other systems approved by the Manufacturer.

C. Topcoat

- i. The topcoat (Perdüre UMC-CO) shall be mixed and applied per manufacturer recommended procedure.
- ii. The topcoat shall be comprised of here components, a resin, hardener and filler as supplied the Manufacturer
- iii. The topcoat will be applied at the rate of 100ft²/kit.

- iv. Anti-skid if required is broadcast at the rate of 1lb per 100ft² (or as approved by the Owner/Architect) and back rolled into the coating.
- v. The nominal thickness of the flooring system shall be 1/4" or 3/8" as specified in the drawings.

3.04 FIELD QUALITY CONTROL

A. Tests, Inspection

- i. The following tests shall be conducted by the Installer:
 - a. Air and Substrate temperature and dew point if applicable.
 - b. Coverage rates: Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.05 CURING & PROTECTION

- A. Allow the floor system to cure 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. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.
- C. Protect finished work until fully cured in accordance with manufacturer's recommendations.

END OF SECTION