SECTION 03 54 16
HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, general provisions of the Contract, and other related construction documents such as Division 01 specifications apply to this Section.

1.2 SUMMARY

A. This Section includes the installation of a self-leveling concrete topping for fast-track resurfacing, smoothing or leveling of indoor concrete and certain non-porous surfaces.

1. ARDEX K 520™ Self-Leveling Concrete Topping
2. ARDEX P 51™ Primer
3. ARDEX EP 2000™ Substrate Preparation Epoxy Primer
4. ARDEX CG™ Concrete Guard Sealer

B. Related Sections include the following:

1. Section 03 30 00, Cast-In-Place Concrete
2. Section 09 05 61.13, Moisture Vapor Emission Control
3. Division 09 Flooring Sections

1.3 REFERENCES

A. ASTM C1708 - 12 Standard Test Methods for Self-leveling Mortars Containing Hydraulic Cements

B. ASTM C 109M, Compressive Strength Air-Cure Only

C. ASTM C348, Flexural Strength of Hydraulic-Cement Mortar

D. ASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes.

E. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.

B. Qualification Data: For Installer

1.5 QUALITY ASSURANCE

A. Installation of the ARDEX product must be completed by a factory-trained applicator, such as an ARDEX LevelMaster® Elite or Choice Contractor, using mixing equipment and tools approved by the manufacturer. Please contact ARDEX Americas (724) 203-5000 for a list of recommended installers or visit www.ardexamericas.com.

B. Product must be cement-based having an inorganic binder content which includes a minimum 80% Portland cement per ASTM C150: Standard Specification for Portland Cement and other specialty hydraulic cements. Gypsum products are not acceptable.

C. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for not less than 10 years. Contact Manufacturer Representative prior to installation.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.

B. Store products in a dry area with temperature maintained between 50° and 85°F (10° and 29°C) and Protect from direct sunlight.

C. Handle products in accordance with manufacturer's printed recommendations.

1.7 PROJECT CONDITIONS

A. Do not install material below 50°F (10°C) surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if substrate is warm and follow warm weather instructions available from the ARDEX Technical Service Department.

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENT

A. Self- Leveling Concrete Topping

1. Acceptable Products:

a. ARDEX K 520™; Manufactured by ARDEX Americas: 400 Ardex Park Drive, Aliquippa, Pa 15001 USA 724-203-5000. www.ardexamericas.com

i. Primer: ARDEX P51™

ii. Primer for installations where aesthetics are critical or non-absorbent substrates and all polishing applications: ARDEX EP 2000™ with a sand broadcast

2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70° F+/-3°F (21° C+/-3°C) and 50% +/-5% relative humidity:

a. Application: Barrel Mix or Pump
b. Flow Time: Approx. 10 minutes
c. Walkable: 2-3 hours
d. Compressive Strength: 6,000 psi (3420.0 kg/cm2) at 28 days, ASTM C109M
e. Flexural Strength: 1,200 psi (84 kg/cm2) at 28 days, ASTM C348
f. VOC: 0
g. Color: Gray

2.2 WATER: Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).

2.3 SEALER: Ardex CG™ Concrete Guard or as specified by Architect

PART 3 – EXECUTION

3.1 PREPARATION

A. General: Prepare substrate in accordance with manufacturer's instructions.

1. Prior to proceeding please refer to ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before priming.
2. The concrete surface must have a minimum ICRI Concrete Surface Profile of 3 (CSP #3). Acid etching and the use of sweeping compounds and solvents are not acceptable.

3. Non-Absorbent substrates, such as terrazzo and ceramic and stone tiles must be mechanically abraded to create a bonding surface. Note that ARDEX K 520 can be used as a polished topping over concrete and terrazzo substrates only.

4. Substrates shall be inspected in accordance with ASTM F2170 and corrected for moisture or any other conditions that could affect the performance of the topping or sealer. For areas where moisture vapor emissions exceed the limits required by the sealer manufacturer refer to Section 00 05 61.13, Moisture Vapor Emission Control and install

the appropriate ARDEX Moisture Control System or call ARDEX Technical Services for product recommendations. ARDEX K 520™ is intended for use over dry substrates only. Do not use in areas of constant water exposure, or in areas exposed to permanent or intermittent substrate moisture, as this may jeopardize the performance of the topping and coating. This product is not a vapor barrier and will allow free passage of moisture.

B. Crack and Joint Preparation

1. All Joints and Moving Cracks –under no circumstances should ARDEX K 520™ be installed over any joints or moving cracks. Joints and moving cracks may be filled with ARDEX ARDISEAL™ Rapid plus Semi-Rigid Joint Sealant.
2. Dormant Cracks – Fill all dormant cracks greater than 1/32" with ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair.

3.2 APPLICATION OF ARDEX K 520™:

A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.

B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.

C. Priming:

1. In areas where aesthetics are not critical, standard concrete can be primed with ARDEX P51™ Primer in accordance with the technical data sheet.
2. In areas where aesthetics are critical, for non-absorbent substrates and all polishing applications, install ARDEX EP 2000™ Substrate Preparation Epoxy Primer with a sand broadcast according to the technical data sheet.

D. Mixing: Comply with manufacturer's printed instructions and the following.

1. Add 5 quarts (4.73 L) of clean potable water per 50 lb. (22.7 kg) bag.
2. Mix using a ½" (650 rpm) low speed heavy-duty mixing drill with an ARDEX T-1 mixing paddle. Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Do not overwater.
3. Aggregate mix: For areas with thicknesses greater than 1'' (2.5 cm), mix ARDEX K 520 with washed and well-graded 1/8'' - 3/8'' (3 - 9.5 mm) pea gravel. Please note that the aggregate size must not exceed 1/3 the depth of the pour. Mix the ARDEX K 520 with water first, and then add 1 part aggregate by volume, mixing until the aggregate is completely coated. Do not use sand. If the aggregate is wet, reduce the amount of water to avoid overwatering. The addition of aggregate will diminish the workability of the product and may make it necessary to install a neat coat to obtain a smooth surface. Allow the initial application to dry for 12 - 16 hours, and then prime this layer with ARDEX EP 2000 with sand broadcast in accordance with the technical data sheet. Allow

the primer to dry for a minimum of 16 hours, then broom sweep and vacuum the surface to remove all loose sand prior to installing the neat coat of ARDEX K 520.

4. When installing ARDEX K 520™ in high-stress areas subject to rolling loads such as rubber-wheel forklift traffic or similar usage, the addition of ARDEX E 25 Resilient Emulsion is required to increase the resiliency of the ARDEX K520™. Please follow manufacturer guidelines for mixing instructions.

5. For pump installations, ARDEX K 520™ shall be mixed using the ARDEX ARDIFLO™ Automatic Mixing Pumps. Contact ARDEX Technical Services for more information.

E. Application: Comply with manufacturer's printed instructions and the following.

1. ARDEX K 520™ may be installed at a minimum thickness of 1/4" (6mm). ARDEX K520™ can be installed up to 1" (25 mm) over large areas neat, and up to 3" (7.5 cm) with the addition of proper aggregate. ARDEX K 520™ can also be tapered to match existing elevations. Install at a minimum thickness of 3/8" (9.5 mm) if being used as a polished topping.

2. Pour or pump the liquid ARDEX K 520™ and spread in place with the ARDEX T-4 Spreader. Use the ARDEX T-5 Smoother and featheredge and touch-up. Wear non-metallic cleats to avoid leaving marks in the liquid ARDEX K 520™.

F. Curing

1. ARDEX K520™ can be walked on in 2-3 hours. Dry time prior to sealer application varies by sealer type and thickness of application. Follow ARDEX recommendation for dry time prior to the installation of the sealer.

G. Sealing

1. The surface of ARDEX K 520™ must always be protected from oil, salt, water and surface wear by applying a suitable protection system. ARDEX recommends the use of ARDEX CG™ Concrete Guard to seal ARDEX K 520™ that will be exposed to normal foot traffic. Sealing with ARDEX CG can proceed after 24 hours under standard conditions of 70°F/21°C and 50% RH).

2. For areas to receive heavier traffic, as well as areas such as restaurants and food courts, sealing should be done using an appropriate wear protection coating. As the performance of coating systems varies greatly, the installer is responsible for assessing the suitability of these coatings.

a. If a waterborne sealer is to be applied at a thickness not-to-exceed a total of 20 mil (0.5mm), the coating can be applied as soon as the surface of the ARDEX K 520™ after 24 hours (at 70°F/21°C).

b. When using a solvent-borne or 100% solids coating applied at a total thickness of 20 mils (500 microns) or less, the ARDEX K520™ must cure for a minimum of 48 hours at 70°F (21°C).

c. When the total application thickness will exceed 20 mils (500 microns), the ARDEX K 520™ must cure 7 days at 70°F (21°C) and the surface of the ARDEX K 520 must be shot blasted prior to the protection layer being installed.

3. Traffic can proceed as soon as the sealer / coating has cured in accordance with manufacturer recommendations. Drying time is a function of jobsite temperature and humidity conditions and the installation thickness. Low substrate temperatures and/or high ambient humidity will extend the drying time. Adequate ventilation and heat will aid drying. Forced drying can dry the surface of the underlayment prematurely and is not recommended.

4. If ARDEX K 520 is to receive a high-build epoxy, please contact the ARDEX Technical Service Department.

3.3 FIELD QUALITY CONTROL

A. Where specified, field sampling of the Ardex topping is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

3.4 PROTECTION

A. ARDEX K 520™ wear surfaces should be adequately protected from damage resulting from construction traffic or other use that can affect the finished floor; by the use of plywood, Masonite or other suitable protection course.

3.5 MAINTENANCE

A. Once installed, any finished floor surface requires routine cleaning and maintenance. After installing the initial coats of the sealer, the best way to ensure the long-term appearance of a newly installed floor is by the use of a sacrificial floor finish (“wax” or “polish”) applied over the surface of the newly installed and sealed floor. All floor coatings will wear as a function of traffic and maintenance, and the use of a sacrificial coating avoids wear on the original sealer while providing a simple maintenance solution.

END OF SECTION