SECTION 03 01 30
Concrete Moisture Control & Self-Leveling Concrete Topping

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 a single-coat, fast-curing, 100% solids epoxy moisture management system formulated to suppress excessive moisture vapor emissions in new or existing concrete prior to the installation of an ARDEX Self-leveling concrete topping. Application of joint filler for both moving and non-moving cracks and joints. Application of a stain protector/guard to inhibit absorption of liquid into the surface, thereby minimizing the potential for discoloration due to staining. Application of topical and/or integral color.

1. ARDEX ARDIFIX™ Two-Part, Low Viscosity Rigid Polyurethane Crack & Joint Repair
2. ARDEX ARDISEAL™ RAPID PLUS Semi-Rigid Joint Sealant
3. ARDEX MC™ Rapid One-Coat Moisture Control System for Concrete to Receive ARDEX Products - For Use as a Fast-Track Primer and Moisture Control
4. ARDEX SD-T™ Self-Leveling Concrete Topping
5. Integral and Topical color
6. Stain and Wear Protection

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

1.3 REFERENCES

A. ASTM C109M, Compressive Strength Air-Cure Only

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

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

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

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data, a Revit file with applicable materials meeting the Revit Content Style Guide, and installation instructions for each material and product used. Include manufacturer’s Safety Data Sheets.

B. Qualification Data: Provide written documentation from the manufacturer confirming that installer meets the qualifications as specified and is eligible for manufacturer’s warranty. Provide project names, address, contact names, phone numbers of at least three projects of similar scope completed by the installer

C. Maintenance Data: Provide instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under intended use. These instructions should contain precautions against cleaning products and methods that may be detrimental to finishes and performance.

1.5 QUALITY ASSURANCE

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

B. Mock-Up: Before performing the work in this section, an on-site mock-up of the representative product and specified process, surface, finish, color, and joint design/treatments must be installed for review and approval. These mock-ups should be installed using the same Installer personnel who will perform work. Approved mock-ups may become part of completed work, if undisturbed at time of substantial completion. Mock-up must also include specified edge finish and approved by the Architect/owner’s representative.

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.

D. Pre-Installation Conference:

1. Prior to the installation of the ARDEX MC™ RAPID & ARDEX SD-T™ an on-site conference shall be conducted to review specification requirements.

2. The minimum agenda shall include a review of the site conditions, construction documents, schedule, installation procedures, protection procedures and submittals.

E. Warranty:

1. ARDEX MC™ RAPID: Certified applicator must file a pre-installation checklist with the

manufacturer and receive written confirmation of the approval to proceed to obtain the extended ARDEX MC™ RAPID Warranty. Upon receipt and approval of the pre-installation checklist, a 25-year ARDEX MC™ RAPID Warranty is available for ARDEX LevelMaster Elite® Installers and a 20-year ARDEX MC™ RAPID Warranty is available for factory-trained installers.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in original containers, bearing manufacturer's labels indicating brand name and directions for storage, factory numbered and sealed until ready for installation.

B. Store all materials in a dry, climate-controlled environment at a minimum of 50°F (10°C) and maximum of 85°F (29°C).

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

1.7 SITE CONDITIONS

A. Observe the basic rules of concrete work. Do not install below 50°F (10°C) or above 85°F (29°C) surface temperature. Install quickly if floor is warm (above 70°F/21°C and up to 85°F/29°C) and follow warm weather precautions available from the ARDEX Technical Service Department (724) 203-5000. Never mix with cement or additives other than ARDEX approved products.

B. Inspect the existing substrate and document unsatisfactory conditions in writing. Verify that surfaces and site conditions are ready to receive work. Correct unacceptable conditions prior to installation of System. Commencement of work constitutes acceptance of substrate conditions.

C. Close areas to traffic during and after the ARDEX MC™ RAPID & ARDEX SD-T™ installation.

PART 2 – PRODUCTS

2.1 MOISTURE VAPOR EMISSION CONTROL

A. One-Coat Moisture Control System for Concrete to Receive ARDEX Underlayment's and Toppings

1. Acceptable Products:

   ARDEX MC™ RAPID; Manufactured by ARDEX Americas: USA, (724) 203-5000, www.ardexamericas.com

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: Manual
   b. Material Requirements on CSP 3 Prepared Concrete: Approx. 250 - 270 sq. ft. (25 m^2) per mixed unit for 10 mils, and approx. 170 – 190 sq. ft. (16 – 18 m^2) per unit for 14 mils

c. Permeability (ASTM E96): ≤ 0.06 perms
d. 14 pH solution (ASTM D1308): No effect
e. Working Time: 20 minutes
f. Pot Life: 20 minutes
g. VOC: 19.9 g/L, A+B, ASTM D2369 Walkable: Minimum of 4 hours
h. Prime and Install Underlayment: Minimum 4 hours, maximum 24 hours

2.2 SELF-LEVELING CONCRETE TOPPING

A. Portland Cement-based Self-Leveling Topping. Acceptable products include:

1. ARDEX SD-T™ Self Leveling Concrete Topping; ARDEX Americas; USA; (724) 203-5000; www.ardexamericas.com

a. Water: Shall be clean, potable and sufficiently cool (not warmer than 70°F/21°C)

2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70°F (20°C) and 50%relative humidity:

a. Flow Time: 10 minutes
b. Compressive Strength: 6,100 psi at 28 days, ASTM C109M
c. Flexural Strength: 1,200 psi at 28 days, ASTM C348
d. VOC: 0
e. Color: Gray & White

2.3 Low Viscosity Rigid Polyurethane Crack and Joint Repair; ARDEX ARDIFIX™; Manufactured by ARDEX Americas; USA; 724-203-5000, www.ardexamericas.com

2.4 Semi-Rigid Joint Sealant; ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant; Manufactured by ARDEX Americas; USA; 724-203-5000, www.ardexamericas.com

2.5 Topical Color: As selected by Architect

2.6 Integral color

1. As selected by Architect. Powder or liquid pigments can be utilized for integral pigmentation. The pigments must be suitable for use with a cementitious product.

2.7 STAIN & WEAR PROTECTION: As specified by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Verify that existing concrete has cured a minimum of 28 days before installing ARDEX Concrete Toppings and meets the strength requirement of a minimum compressive strength of 3000 psi, a minimum density of 100 pcf and a minimum tensile strength of 200 psi.

C. Conduct pre-installation conference, per Section 1.5 C.

3.2 PREPARATION

A. 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. Mechanically clean if necessary. Acid etching and the use of sweeping compounds and solvents are not acceptable.

B. Concrete shall be mechanically prepared to achieve a concrete surface profile (CSP) 3 in accordance with ICRI standards

C. Prior to beginning the installation, the relative humidity within the concrete can be measured (ASTM F2170). No standing water shall be present.

3.3 CRACK & JOINT TREATMENT

A. Joint Preparation: Honor all moving cracks and all joints, including expansion joints, isolation joints and control joints (saw cuts), up through the ARDEX Toppings.

a. All dormant cracks must be pre-filled with ARDEX ARDIFIX™ in strict accordance with the installation instructions provided by the ARDEX Technical Department. Once the dormant cracks have been properly filled, broadcast sand to refusal, and allow these areas to cure thoroughly. Remove all excess sand prior to proceeding with the ARDEX MC™ RAPID installation.

b. All joints, including control joints, expansion joints and isolation joints, and moving cracks must be honored up through the ARDEX MC RAPID, the ARDEX Topping and the sealer by installing a fully flexible sealing compound designed specifically for this use, such as ARDEX ARDISEAL RAPID PLUS.

3.4 APPLICATION OF ARDEX MC™ RAPID:

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

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

1. Each individual 22 lb. (10 kg) unit contains separate, pre-measured quantities of hardener (Part B) and the resin (Part A). After opening each container, stir the individual components thoroughly before blending. The hardening agent (Part B) is added to the resin (Part A).

2. Pour all the hardener into the resin portion and stir thoroughly for a minimum of 3 minutes using a low-speed drill and an epoxy mixing paddle. Once mixed, pour some of the epoxy back into the hardener container, stir for 10 seconds, and then pour all the contents back into the resin container. Mix for an additional 30 seconds before applying.

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

1. Apply the freshly mixed ARDEX MC™ RAPID at a minimum thickness of 14 mils as specified in the technical data sheet to the prepared concrete surface in a uniform direction with a short-nap paint roller or notched squeegee with back-rolling for smoother surfaces, and a longer nap roller for more uneven substrates. Sand broadcast to refusal while the ARDEX MC RAPID is still in a fresh state. When broadcasting the sand, use a NIOSH-approved dust mask in conformance with OSHA requirements regarding the handling of sand (crystalline silica).

2. Following the application of MC RAPID and sand broadcast, install the selected ARDEX Topping as outlined in the technical data sheet.

3. It is not necessary to re-test the substrate for moisture emissions prior to installing the coating or floor covering.

3.5 APPLICATION OF ARDEX SD-T™

A. PRIMING

1. No additional priming is needed. The sand-broadcast surface of the ARDEX MC™ RAPID serves as the primer prior to the ARDEX Topping application.

B. MIXING

1. Mix ARDEX SD-T® 2 bags at a time. Mix each 50 lb. (22.7 kg) bag with 5 quarts (4.75 liters) of water.

2. Mix using a ½” (650 rpm) low speed heavy-duty mixing drill with an ARDEX T-1 mixing paddle. Do not overwater.

3. Aggregate mix: For areas to be installed over 2” thick, mix ARDEX SD-T® with water first, then add 1-part aggregate by volume of washed, well-graded pea gravel (1/8" to 1/4"), mixing until the aggregate is completely coated. Do not use sand. If the aggregate is wet, reduce the amount of water to avoid overwatering. Note: The addition of aggregate will diminish the workability of the make it necessary to install a finish coat to obtain a smooth surface. Allow the initial application to dry for 12 to 16 hours (70°F). For ARDEX Designer Floor applications, the aggregate course must be primed with ARDEX EP 2000™. Note: For ARDEX Designer Floor installations requiring an aggregate course over standard absorbent concrete, only the finish layer requires the use of ARDEX EP 2000™. For non-designer applications, the aggregate course must be primed using the double-prime method with ARDEX P 51.

4. For pump installations, ARDEX SD-T® shall be mixed using the ARDEX ARDIFLO™ Automatic Mixing Pumps. Contact the ARDEX Technical Service Department (724) 203-5000 for complete pump operation instructions.

5. When mixing sanded materials, ARDEX recommends using the ARDEX DUSTFREE™ or a standard “gutter hook” vacuum attachment in combination with a wet/dry (Shop-

Vac® style) vacuum and HEPA dust extraction vacuum system. Additionally, each bag should be handled with care and emptied slowly to avoid creating a plume of dust. Contact the ARDEX Technical Service Department for more details on ARDEX products and air quality management. use a NIOSH-approved dust mask in conformance with OSHA requirements regarding the handling of sand (crystalline silica).

C. APPLICATION

1. The minimum installation thickness for ARDEX SD-T Topping shall be ¼" (6 mm,) up to 2". The necessary thickness will vary with jobsite conditions and must be adequate to achieve the desired finish.
2. Pour or pump the liquid topping and spread in place with the ARDEX T-4 Spreader. Use the ARDEX T-5 Smoother for installation. Contact ARDEX Technical Services if a spike roller is to be used. Wear baseball shoes with non-metallic cleats to avoid leaving marks in the liquid topping. The topping can be walked on in 2-3 hours at 70°F (21°C)

D. CURING

1. ARDEX SD-T® can be walked on in 2-3 hours. Dry time prior to sealer application varies by sealer type and thickness of application. Follow ARDEX recommendations in the technical data sheet for dry time prior to the installation of the sealer.

E. SEALING

1. The surface of ARDEX SD-T® must always be protected from oil, salt, water, and surface wear by applying a suitable protection system. 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.

3.6 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.

B. ARDEX SD-T® wear surfaces should be adequately protected from damage resulting from construction traffic or other use that can affect the finish floor.

C. ARDEX SD-T® wear surfaces are intended for foot traffic, moderate, rubber-wheeled traffic and similar uses. Excessive service conditions, such as steel or hard plastic-wheeled traffic, or dragging heavy metal equipment or loaded pallets with protruding nails over the floor, will cause gouging and indentations. ARDEX SD-T® is not a resurfacing topping for heavy-duty manufacturing or industrial floors, or for chemical environments requiring customized industrial toppings.

3.7 PROTECTION

A. ARDEX SD-T® wear surfaces should be adequately protected from damage resulting from construction traffic or other use that can affect the finish floor.

B. ARDEX SD-T® wear surfaces are intended for foot traffic, moderate, rubber-wheeled traffic, and similar uses. Excessive service conditions, such as steel or hard plastic-wheeled traffic, or dragging heavy metal equipment or loaded pallets with protruding nails over the floor, will cause gouging and indentations. ARDEX SD-T® is not a resurfacing topping for heavy-duty manufacturing or industrial floors, or for chemical environments requiring customized industrial toppings.

C. Protect the new ARDEX Topping from spills and contamination by petroleum, oil, hydraulic fluid, acid and acidic detergents, paint and other liquid dripping from trades and equipment working over these substrates. If construction equipment must be used on these substrates, diaper all components that may drip fluids. Protect surface by installing a protective floor covering.

D. **Avoid moisture for 72 hours after installation.** Don't permit standing water for this period or place any protective plastic sheeting, rubber matting, rugs or furniture that can prevent proper drying, thereby trapping moisture, which can result in a cloudy effect on the floor.

3.8 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 using 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