

ARDEX GUIDE SPECIFICATION
ARDEX FDM™ Full Depth Repair Mortar
Concrete Repair Mortar with Corrosion Inhibitor

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

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 Portland cement-based, structural repair mortar with integral corrosion inhibitor.

- 1. ARDEX FDM™ Full Depth Repair Mortar
- 2. ARDEX P 71™ Primer
- 3. ARDEX BACA™ Bonding & Anti-Corrosion Agent

- B. Related Sections include the following:

- 1. Section 03 30 00, Cast-In-Place Concrete

1.3 REFERENCES

- A. ASTM C109, Compressive Strength of Hydraulic Cement Mortars
- B. ASTM C293, Flexural Strength of Concrete
- C. ASTM C469, Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression
- D. ASTM C157, Length Change of Hardened Hydraulic-Cement Mortar and Concrete
- E. ASTM C1202, Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration
- F. ICRI Technical Guideline No. 03732 Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays

- G. ICRI Technical Guideline No. 03730 Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion

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. Manufacturer's Qualifications: The manufacturer shall be a company with at least five years experience and regularly engaged in the manufacture and marketing of products specified herein.
- B. Installation of the ARDEX product must be completed by a factory-trained, certified applicator, such as an ARDEX LevelMaster® Elite or Choice Contractor, using mixing equipment and tools approved by the manufacturer. Please Contact ARDEX Engineered Cements (724)203-5000 for a list of recommended installers.

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 CAST-IN-PLACE CONCRETE

- A. Portland cement-based structural repair mortar, with integral corrosion inhibitors suitable for exterior and interior horizontal applications above, on or below grade.
 - 1. Acceptable Products:
 - a. ARDEX FDM™; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, Pa 15001 USA 724-203-5000
 - 2. Performance and Physical Properties: Meet or exceed the following values for material cured at 73° F (23° C) and 50 percent relative humidity:
 - a. Application: Trowel
 - b. Working Time: 20 – 40 minutes
 - c. Compressive Strength: 4,800 psi at 7 days, 6,000 psi at 28 days, ASTM C39
 - d. Flexural Strength: 1,100 psi at 7 days, 1,150 psi at 28 days, ASTM C293
 - e. Modulus of Elasticity in Compression: 3.7×10^6 psi at 28 days, ASTM C469
 - f. Color: Gray

PART 3 – EXECUTION

3.1 PREPARATION

- A. General: Prepare substrate in accordance with manufacturer's instructions. Prior to proceeding with any repair, please refer to the International Concrete Repair Institute's ICRI 03730 Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion; ICRI 03732 Guideline for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays; and the American Concrete Institute's ACI 546R-04 Concrete Repair Guide for general guidelines for concrete repair.
 - 1. All substrates must be sound, solid, dry, and completely free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker. Overwatered, frozen or otherwise weak concrete surfaces must also be cleaned down to sound, solid concrete by mechanical methods such as scarifying, scabbling or similar in accordance with ICRI 03732 before priming. Acid etching and the use of sweeping compounds and solvents are not acceptable.
 - 2. The repair area must be saw cut in a basic rectangular shape at least 1/2" (12 mm) in depth. The cuts should be made at 90° angle, and should be slightly keyed. Chip out the concrete inside the cuts to a minimum depth of 1/2" (12 mm) until the area is squared or box shape.

3. Mechanically prepare surface to obtain an exposed aggregate surface with a minimum surface profile of approximately 1/16" (1.5 mm) / ICIR concrete surface profile of 5 (CSP #5).
4. For cases with exposed reinforcing steel, prepare the concrete such that a minimum 3/4" (19 mm) is achieved around the steel to ensure sufficient placement of the corrosion inhibitor. Mechanically clean the steel to remove all rust and any other contaminants in accordance with ICRI 03730. Prime the steel with ARDEX Bonding & Anti-Corrosion Agent™ prior to proceeding with repair. For further details, please refer to the ARDEX Technical data sheet.

B. Joint Preparation

1. Moving Joints and Moving Cracks – honor all expansion and isolation joints up through the ARDEX FDM™. A flexible sealing compound suitable for the application may be installed. ARDEX ARDISEAL™ RAPID PLUS may be installed for interior applications only.
2. Dormant control joints and dormant cracks greater than 1/16" – fill with ARDEX ARDIFIX™ Joint Filler. Please note that the repair material must be sand broadcast to refusal to create a bonding surface for the ARDEX FDM. The filling of dormant cracks and dormant joints as described is recommended to help prevent telegraphing. However, should movement occur, cracks and joints will reappear. ARDEX recommends wearing an N-95 dust mask when broadcasting sand. Use a heavy-duty, bucket-style (Shop-Vac®-style) vacuum and HEPA dust extraction vacuum system.

3.2 APPLICATION OF ARDEX FDM™:

- 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 and landscaping from contact due to mixing and handling of materials.
- C. Mixing: Comply with manufacturer's printed instructions and the following.
 1. Precondition components to temperature of 70° plus or minus 5°F (21° plus or minus 2.5°C) prior to mixing.
 2. Add 5 to 6 pints (2.37 to 2.84 L) of clean water per 50 lb. (22.7 kg) bag. Slowly add one-third of a 50 lb. (22.7 kg) bag of ARDEX FDM. Once this is blended, add the next third and so on until all the material is added.
 3. Mix using a low-speed heavy-duty drill with a heavy gauge square box (butterfly) mixing paddle. Forced action mortar mixers are also suitable. Mix to a uniform, lump-free consistency. Avoid over-mixing.

4. For application depths greater than 4" (10.2 cm), including full depth repairs up to 8" (20.3 cm), add 25 lbs. (11.3 kg) of clean, uniformly graded saturated-surface-dry 3/8" (0.95 mm) aggregate per bag, as directed by manufacturer. Mix the FDM with water first, then add the aggregate and mix until it is uniformly coated.
5. If additional water is required, you may add up to 8 oz. (0.24 L) of additional mix water per bag. Do not overwater.

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

1. Do not apply in freezing conditions or during precipitation.
2. Comply with manufacturer's guides for hot and cold weather application.
3. Dampen substrate to fill concrete pores with water. Remove ponding, glistening, or surface water (saturated surface dry). Alternatively, ARDEX P 71™ Primer can be used in accordance with the ARDEX Technical Data Sheet. Do not allow the concrete or ARDEX P 71™ to dry before installing ARDEX FDM™. If ARDEX Bonding & Anti-Corrosion Agent is specified as a primer, follow the application instructions in the ARDEX Technical Data Sheet.
4. Apply scrub coat of repair mortar into the primed or SSD concrete substrate to ensure good mortar-to-concrete contact.
5. Apply ARDEX FDM™ while scrub coat is wet. If the scrub coat is allowed to dry, it must be removed mechanically and reapplied before applying the mortar. Consolidate and steel trowel to the desired finish.
6. When pouring into closed forms, the repairs should be vibrated to ensure full contact and to establish bond with the substrate, as well as to ensure proper consolidation. Avoid over-vibration.
7. ARDEX FDM™ can be installed to a minimum thickness of 1/2" up to 4" (12.7 mm to 10.2 cm) neat or up to 8" thick with the proper addition of aggregate.

E. Curing

1. Keep surface damp for 48 hours with continuous light water-fogging or curing blanket. Do not allow the water to puddle. Do not use solvent-borne curing compounds.
2. Allow ARDEX FDM™ to cure a minimum of 72 hours prior to the installation of final coatings or sealers.

F. Cleaning: Remove excess material before material cures. If material has cured, remove using mechanical methods which will not damage substrate.

END OF SECTION