

# LOW-P™ FA1

Low Permeability Cement with Fly Ash



## PRODUCT DATASHEET

**DESCRIPTION:** Rapid Set® LOW-P™ FA1 is a low permeability, corrosion inhibiting, fast-setting hydraulic cement. When mixed with water and aggregates, LOW-P FA1 produces concrete mixtures with unparalleled performance and ease of use. The finished LOW-P FA1 concrete exhibits exceptional long-life durability in harsh freeze-thaw conditions.

**APPLICATIONS:** LOW-P FA1 is ideal for fast-track bridge deck overlays, pavement repairs, elevated deck repairs, parking structures, marine structures, and other projects where low chloride ion permeability, corrosion resistance, and fast strength gain are desired. LOW-P FA1 is superior to portland cement latex modified concrete, low slump concrete, microsilica/silica fume concrete, and polyester concrete.

**ENVIRONMENTAL ADVANTAGES:** Use LOW-P FA1 to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO<sub>2</sub> than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

**SURFACE PREPARATION:** For repairs, application surface must be clean, sound and free from any materials that may inhibit bond, such as oil, asphalt, curing compound, acid, dirt and loose debris. Roughen surface and remove all unsound material. Apply LOW-P FA1 cement concrete to a thoroughly saturated surface. Standing water and puddles should be removed from the surface. Scrub coats or brush-in coats are not required.

**MIXING:** LOW-P FA1 concrete mixes may be batched using continuous volumetric mixer equipment or a weight batch mixer. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. Working time is approximately 15 to 20 minutes. CAUTION: Do not use additional fly ash or microsilica additives, or pozzolonic materials.

**PLACEMENT:** LOW-P FA1 may be placed using traditional methods. Organize work so that all personnel and equipment are ready before placement. Place, consolidate, and screed quickly to allow for maximum finishing time. Do not wait for bleed water. Apply final finish as soon as possible. LOW-P FA1 concrete may be troweled, floated or broom finished. Use a method of consolidation that eliminates air voids. Roller and truss screeds can be used for small overlay placements. Self-propelled screed/finishing equipment should be used for all large applications. Patching and small overlay work may require additional internal vibration. Straight edge or bull floats can be used directly behind screed/finisher equipment to ensure closure of concrete surface. Surface retardants or water misting should be used to reduce evaporation. Broom or tine the concrete as soon as the surface can hold the finish applied. Do not install on frozen surfaces.

**COLD WEATHER:** Environmental and material temperatures below 70°F (21°C) may delay setting time and reduce the rate of strength gain. Lower temperatures will have a more pronounced effect. Thinner sections will be more significantly affected. To compensate for cold temperatures, keep material warm, use heated mix water and follow ACI 306 Procedures for Cold Weather Concreting.

## OVERVIEW

### Highlights:

Low permeability: Less than 1000 coulombs

ASR resistant

Fast: Minimizes downtime. Ready for traffic in 1 to 3 hours

Strong: 3 hours – 3200 psi (22.1 MPa),  
28 days – 7500 psi (51.7 MPa)

Durable: Low shrinkage, non-metallic, no added chlorides, sulfate resistant, freeze-thaw resistant

Environmentally friendly: Lower carbon emissions, contains post-industrial recycled content

Easy to place: High slump, non-segregating formula

Corrosion protection: Resistance to corrosion caused by chlorides (deicing salts)

### Approved:

State (DOT) and local approvals

### MasterFormat®

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayment
03 01 70	Maintenance of Mass Concrete
03 05 00	Concrete Bonding Agents, Admixtures and Adhesives
03 31 00	Structural Concrete Cast In Place
03 53 19	Concrete Overlayment

### Manufacturer:

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**WARM WEATHER:** Environmental and material temperatures above 70°F (21°C) may speed setting time and increase the rate of strength gain. Higher temperatures will have a more pronounced effect. To compensate for warm temperatures, keep material cool, use chilled mix water and follow ACI 305 Procedures for Hot Weather Concreting. The use of retarding admixtures will help offset the effects of high temperatures.

**CURING:** For overlays, the surface should be covered promptly after final finishing with a single, clean layer of wet burlap. Immediately following the covering of wet burlap, a layer of clear polyethylene film should be placed over the wet burlap. Patches can be water cured by maintaining a moist sheen on the surface. The curing layers should remain until the concrete has reached the strength desired. Depending on temperature and specified strength, this will usually be within 1 to 3 hours after final finishing. During this period, apply more water, as needed, to keep the entire concrete surface continuously wet.

**FIELD TESTS:** It is recommended to conduct field test panels at the jobsite using the prepared substrate and the approved LOW-P FA1 cement concrete mix design to determine actual field performance and suitability for the intended use.

**AVAILABILITY:** LOW-P FA1 is available nationwide in 2000-lb bulk bags and 50-lb bags.

**STORAGE & SHELF LIFE:** LOW-P FA1 has a shelf life of 12 months when stored properly in a dry location, protected from moisture, out of direct sunlight, and in an undamaged package.

**USER RESPONSIBILITY:** Before using CTS products, read current technical data sheets, bulletins, product labels and safety data sheets at [www.CTScement.com](http://www.CTScement.com). It is the user's responsibility to review instructions and warnings for any CTS products prior to use.

**WARNING: DO NOT BREATHE DUST. AVOID CONTACT WITH SKIN AND EYES.** Use material in well-ventilated areas only. Exposure to cement dust may irritate eyes, nose, throat, and the upper respiratory system/lungs. Silica exposure by inhalation may result in the development of lung injuries and pulmonary diseases, including silicosis and lung cancer. Seek medical treatment if you experience difficulty breathing while using this product. The use of a NIOSH/MSHA-approved respirator (P-, N- or R-95) is recommended to minimize inhalation of cement dust. Eat and drink only in dust-free areas to avoid ingesting cement dust. Skin contact with dry material or wet mixtures may result in bodily injury ranging from moderate irritation and thickening/cracking of skin to severe skin damage from chemical burns. If irritation or burning occurs, seek medical treatment. Protect eyes with goggles or safety glasses with side shields. Cover skin with protective clothing. Use chemical resistant gloves and waterproof boots. In case of skin contact with cement dust, immediately wash off dust with soap and water to avoid skin damage. In case of skin contact with wet cement, wash exposed skin areas with cold running water as soon as possible. In case of eye contact with cement dust, flush immediately and repeatedly with clean water, and consult a physician. If wet cement splashes into eyes, rinse eyes with clean water for at least 15 minutes and go to the hospital for further treatment.

Please refer to the SDS and [www.CTScement.com](http://www.CTScement.com) for additional safety information regarding this material.

**LIMITED WARRANTY:** CTS CEMENT MANUFACTURING CORP. (CTS) warrants its materials to be of good quality and, at its option, will replace or refund the purchase price of any material proven to be defective within one (1) year from date of purchase. The above remedies shall be the limit of CTS' responsibility. Except for the foregoing, all warranties expressed or implied, including merchantability and fitness for a particular purpose, are excluded. CTS shall not be liable for any consequential, incidental, or special damages arising directly or indirectly from the use of the materials.

**⚠ WARNING**  
**CANCER and REPRODUCTIVE HARM - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

## TYPICAL PHYSICAL DATA

### MIX DESIGN

Cement – 658 lbs (298 kg)  
 Washed Concrete Sand, ASTM C33 – 1512 lbs (686 kg)  
 3/8" Rock Aggregate – 1417 lbs (643 kg)  
 Water to Cement Ratio – 0.42

### PHYSICAL DATA

#### Setting Time, ASTM C191 Mod.

Initial set	30 minutes
Final set	40 minutes

#### Compressive Strength, ASTM C39

3 hours	3200 psi (22.1 MPa)
24 hours	5000 psi (34.5 MPa)
7 days	6000 psi (41.4 MPa)
14 days	7000 psi (48.3 MPa)
28 days	7500 psi (51.7 MPa)

#### Slant Shear Bond Strength, ASTM C882 Mod.

24 hours	1200 psi (8.3 MPa)
28 days	2000 psi (13.8 MPa)

#### Shrinkage, ASTM C157 Mod.

7 days	0.003%
28 days	0.023%

#### Density

Specific Gravity	2.86
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#### Rapid Chloride Penetration, ASTM C1202

28 days	< 1000 Coulombs
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#### Freeze Thaw, ASTM C666 Procedure A

300 Cycles RDF	95
Weight loss	0.29

All data produced at 70°F (21°C)  
 Performance will vary based on actual aggregate properties and project variables. Complete trial batches to verify performance.



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