

# MORTAR MIX PLUS (MMP)

High-Strength Polymer-Modified Structural Repair Mortar



## PRODUCT DATASHEET

**DESCRIPTION:** Rapid Set® MORTAR MIX PLUS (MMP) is a high-performance, rapid-hardening, multi-purpose, polymer-modified concrete repair material. Durable in wet environments, MMP is a blend of Rapid Set hydraulic cement, advanced additives, and quality aggregates. MMP has been specially formulated to match the color of typical portland cement concrete. MMP is non-metallic and no chlorides are added. Mix MMP with water to produce a workable, high quality repair mortar that is ideal where fast strength gain, high durability and low shrinkage are desired. A corrosion inhibitor is added to increase protection of embedded reinforcement.

**USES:** Use MMP for general and structural concrete repair, construction of pavements, marine applications, underlayments and formed work. MMP is a versatile product that is suitable for horizontal, vertical and overhead applications. MMP contains an air-entraining admixture for freeze-thaw durability. Apply MMP in thicknesses from 1/2" to 6" (1.3 cm to 15.2 cm). For thicker applications, use Rapid Set® CONCRETE MIX.

**ENVIRONMENTAL ADVANTAGES:** Use MMP 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 MMP to a thoroughly saturated surface with no standing water.

**MIXING:** The use of a power-driven mechanical mixer, such as a mortar mixer or a drill-mounted mixer, is recommended. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **MMP may be mixed using 3 to 4 quarts (2.8 L to 3.8 L) of water per 55-lb (25-kg) bag for Department of Transportation projects or other critical applications. For general purpose applications, a maximum of 5 quarts (4.7 L) may be used. Use less water to achieve higher strengths.** For increased fluidity and workability, use Rapid Set® FLOW Control plasticizing admixture. Place the desired quantity of mix water into the mixing container. While the mixer is running, add MMP. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

**INSTALLATION:** MMP may be placed using traditional construction methods. Organize work so that all personnel and equipment are ready before placement. Place, consolidate and screed quickly to allow for maximum finishing time. Use a method of consolidation that eliminates air voids. Do not wait for bleed water; apply final finish as soon as possible. MMP may be troweled, floated or broom finished. On flat work, do not install in layers. For overlay applications, a minimum of one test section should be prepared to evaluate the suitability of the materials and procedures. Install full-depth sections and progress horizontally. To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. Do not install on frozen surfaces. MMP may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C). Under dry ambient conditions, water based coatings such as latex paint can be applied after 4 hours. Solvent based and impermeable coatings such as oil based paint and epoxy can be applied after 16 hours.

## OVERVIEW

### Highlights:

Polymer Modified: Excellent workability, and strong adhesion

Freeze-thaw resistance

Air entrained

Gray Color: Formulated to a concrete gray color

Corrosion Resistance: Integral corrosion inhibitor

Rapid Hardening: High early strength with ample working time

Uses: Horizontal, vertical and overhead structural concrete repairs, underlayments, floors, formed concrete and more

### Conforms to:

ASTM: C928 R3, C387

### Approved:

State (DOT) and local approvals

### MasterFormat® 2016

- 03 01 30 Maintenance of Cast-in-Place Concrete
- 03 01 40 Maintenance of Precast Concrete
- 03 01 50 Maintenance of Cast Decks and Underlayment
- 03 01 70 Maintenance of Mass Concrete
- 03 54 16 Hydraulic Cement Underlayment
- 04 01 00 Maintenance of Masonry

### Manufacturer:

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**CURING:** Water cure all Rapid Set® MORTAR MIX PLUS (MMP) installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing as soon as the surface starts to lose its moist sheen. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required. The objective of water curing shall be to maintain a continuously wet surface until the product has achieved sufficient strength.

**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.

**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 SET Control retarding admixture will help offset the effects of high temperatures.

**YIELD & PACKAGING:** MMP is available in 55-lb (25-kg) bags. One 55-lb (25-kg) bag of MMP will yield approximately 0.50 ft<sup>3</sup> (0.014 m<sup>3</sup>).

**SHELF LIFE:** MMP 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. 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

### Set Time, ASTM C266

Initial set	35 minutes
Final set	55 minutes

### Compressive Strength, ASTM C109 Mod.

1.5 hours	2000 psi (13.8 MPa)
3 hours	3500 psi (24.1 MPa)
24 hours	5500 psi (37.9 MPa)
7 days	6000 psi (41.4 MPa)
28 days	7000 psi (48.3 MPa)

### Splitting Tensile Strength, ASTM C496

28 days	600 psi (4.14 MPa)
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### Slant Shear Bond Strength, ASTM C882 mod. per C928

24 hours	2000 psi (13.8 MPa)
7 days	2500 psi (17.2 MPa)
28 days	3000 psi (20.7 MPa)

### Flexural Strength, ASTM C348

28 days	600 psi (4.14 MPa)
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### Scaling Resistance, ASTM C672 per C928

Visual rating	0
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### Freeze Thaw Resistance, ASTM C666

Durability factor	95% (Procedure A)
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### Length Change, ASTM C157 per C928 (Air Storage)

28 days (max)	-0.03%
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### Length Change, ASTM C157 per C928 (Water Storage)

28 days (max)	+0.02%
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### Rapid Chloride Ion Penetration, ASTM C1202

28 days	< 1000 coulombs
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Data obtained at flow consistency 100 by ASTM C1437 at 70°F (21°C)



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