

DOT CEMENT

Industrial Grade, Fast-Setting Cement



PRODUCT DATASHEET

DESCRIPTION: Rapid Set® DOT CEMENT is a high-performance, rapid-hardening hydraulic cement. Durable in wet environments, DOT CEMENT is a specially formulated blend of Rapid Set® Cement and high performance additives. DOT CEMENT is non-metallic and no chlorides are added. Mix DOT CEMENT with washed concrete sand and stone (ASTM C33 grade) at a 1-2-2 ratio to produce a durable concrete. DOT CEMENT is formulated for long life in freeze-thaw regions. DOT CEMENT can be ready for traffic and loading in 1 hour.

USES: Use DOT CEMENT concrete for the repair of pavement, highways, bridge decks, industrial floors, parking garage decks, freezer floors, formed work, and more. Volumetric mixing equipment may be used for large projects.

ENVIRONMENTAL ADVANTAGES: Use DOT CEMENT to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO₂ than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Customize the mix for specific applications. A trial batch is recommended to optimize performance. For small projects, start with one 50-lb (22.7-kg) bag of DOT CEMENT, 100 lb (45.4 kg) of sand, 100 lb (45.4 kg) of 1/4" to 3/4" (0.64 cm to 1.9 cm) stone and about 2.1 gallons (7.9 L) of clean, potable water. Up to 2.4 gallons (9.1 L) of clean, potable water may be used if higher slumps are desired. For calculating volume, the specific gravity is 2.98 g/cm³. Contact CTS technical support for additional assistance, if needed. DOT CEMENT based concrete may be installed in thicknesses from 2" to 24" (5.1 cm to 61 cm). Required thickness will depend on jobsite specifications.

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. Mechanically abrade surface and remove all unsound material. Apply DOT CEMENT concrete 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 mobile volumetric concrete mixer, is required. **Mix one 50 lb (22.7 kg) bag of DOT CEMENT with 100 lbs (45.4 kg) of sand and 100 lbs (45.4 kg) of 3/8" to 3/4" (0.64 cm to 1.9 cm) stone and 2.1 gallons (7.9 L) of clean, potable water.** Up to 2.4 gallons (9.1 L) of clean, potable water may be used if higher slumps are desired. Do not exceed a slump of 9" measured by ASTM C143 (Standard Test Method for Slump of Hydraulic Cement Concrete). **Mix and place material quickly.**

PLACEMENT: DOT CEMENT based concrete may be placed using traditional construction methods. Place, consolidate and screed quickly to allow for maximum finishing time. Do not wait for bleed water. Apply final finish as soon as possible. Place material into repair area and strike off with a screed. On flat work, do not install in layers. Install full-depth sections and progress horizontally. Use a method of consolidation that eliminates air voids. Working time is approximately 20 minutes at 70°F (21°C). To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. DOT CEMENT based concrete may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

CURING: Most materials made with DOT CEMENT must be cured. Best practices include water curing or the use of curing compounds that comply with ASTM C309 Type 2 Class B such as poly-alpha-methylstyrene (PAMS). Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of

OVERVIEW

Highlights:

Fast: Ready for traffic and loading in 1 hour

Multi-Use: Customize mix designs according to your application

Structural: For repair and new construction

Air Entrained: Formulated for long life in freeze-thaw regions

Conforms to:

ASTM C1600 VRH

Approved:

State (DOT) and local approvals

MasterFormat® 2016

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 31 00	Structural Concrete Cast In Place
03 48 00	Precast Concrete Specialties
03 53 19	Concrete Overlayment

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water curing is to maintain the moist sheen on the entire surface until the product has achieved sufficient strength. Keep exposed surfaces wet for a minimum of 1 hour. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required. The user is responsible for the mix design and determining the appropriate curing method.

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, pre-wet substrate (saturated surface dry) 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: Rapid Set® DOT CEMENT is available in 50 lb (22.7 kg) bags, 2000 lb (907.2 kg) bulk bags and bulk tankers. In the recommended mix design, one bag of DOT CEMENT will yield approximately 1.8 ft³ of concrete.

SHELF LIFE: DOT CEMENT 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. 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 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: Can expose you to crystalline silica, a carcinogen, and hexavalent chromium, a reproductive toxicant. See www.P65Warning.ca.gov.

TYPICAL PHYSICAL DATA

Compressive Strength, ASTM C39

1.5 hours	3140 psi (21.6 MPa)
3 hours	3725 psi (25.7 MPa)
24 hours	4650 psi (32.1 MPa)
28 days	5500 psi (37.9 MPa)

Flexural Strength, ASTM C78

4 hours	500 psi (3.44 MPa)
1 day	650 psi (4.48 MPa)
28 days	1200 psi (8.27 MPa)

Bond Strength, ASTM C882 per C928

24 hours	2000 psi (13.8 MPa)
28 days	2200 psi (15.2 MPa)

ASTM C666 in a 10% solution of Sodium-Chloride (as per North Eastern spec.)

25 cycles	< 0.3% loss
50 cycles	< 0.3% loss

All data produced at 70°F (21°C)



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