CTS Cement Manufacturing Corp. | 12442 Knott Street, Garden Grove, CA 92841 | CTScement.com

Rapid Set KOMPONENT CTS CEMENT MANUFACTURING CORPORATION | Construction Professionals Catalog | Edition 06

CONSTRUCTION PROFESSIONALS CATALOG

ADVANCED
CEMENT TECHNOLOGY

Rapid Set KOMPONENT

by CTS Cement Manufacturing Corp.

TABLE OF CONTENTS

TABLE OF CONTENTS

REFERENCE

ADVANCED CEMENT TECHNOLOGY

CORPORATE CAPABILITIES

Build Smart, Safe & Sustainable

In partnership with Cementos de Chihuahua

Rapid Set KOMPONENT

by CTS Cement Manufacturing Corp.

WHO WE ARE

CTS Cement Manufacturing Corporation is the leader in advanced cement technology. We have an extensive history of providing innovative, high-performance cement products to the construction industry. As the leading manufacturer of calcium sulfoaluminate (CSA) cement in the United States,

CTS offers rapid hardening cement products and Type K shrinkage-compensating concrete products. Both are renowned for their proven performance, high quality, and exceptional durability.

WHAT WE DO

We support the design and construction communities, as well as Federal, State and public agencies to ensure a safe, sustainable, and durable built environment. Our products have been used on notable landmarks like the Hoover Dam Bypass, the Pentagon, the Lincoln Tunnel, the San Francisco-Oakland Bay Bridge, as well as major roadways, airports, commercial and industrial projects worldwide. CTS Cement manufactures two of the industry's leading brands in cement for new concrete construction, restoration and repair – Rapid Set® and Komponent®.

Rapid Set is a full line of professional-grade cement products made with Rapid Set cement, a calcium sulfoaluminate (CSA) cement technology. These products are engineered for high performance, versatility, low shrinkage, and rapid strength gain – performance characteristics that allow you to save significant time and money, with reduced installation times, labor requirements, and long-term operations and maintenance costs. Rapid Set gains structural strength in one hour. You can build faster, quickly put the structure or area into full service, and achieve durable, long-lasting results.

Komponent is a line of shrinkage-compensating concrete products made with Type K cement technology. These products prevent common and costly challenges related to concrete deterioration, repair, and structural failure. Use Komponent technology to minimize or eliminate control joints, alleviate curling and shrinkage cracking, and reduce repair and maintenance costs. Komponent technology protects the integrity and durability of the concrete, extends the service life of the installation, and reduces life-cycle costs. It offers the most sustainable concrete solution available.

Building a Better World

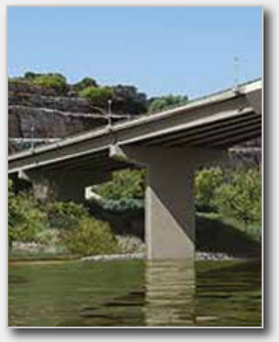
Building a better world means going beyond the status quo and committing to progress and innovation. We challenge the way things have always been done – from the way we engineer and manufacture our cement, to the innovative products we develop, to the way we serve our customers. We partner with architects, engineers, designers, contractors and owners to create a safe, sustainable, and durable built environment for generations to come – project by project, community by community.

CTS Cement Production Facilities

CTS Package Production Facilities

CTS Packaging and Distribution



Sectors We Support

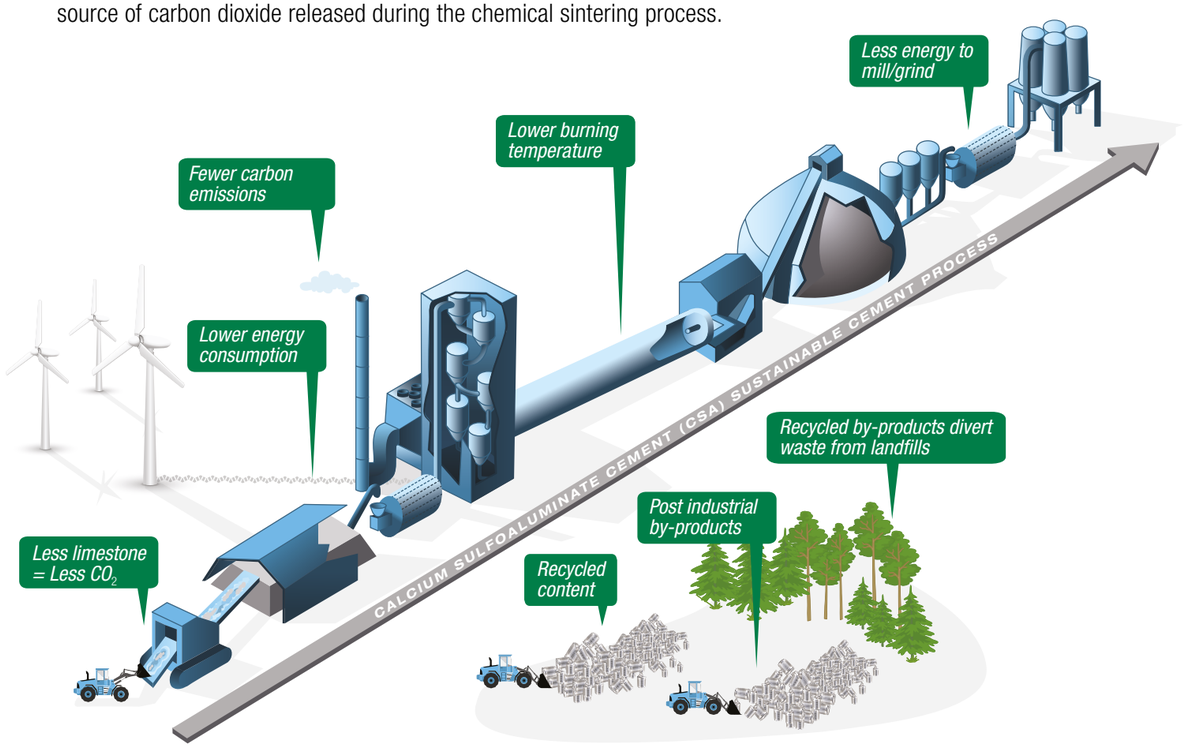
INFRASTRUCTURE
Highways, Roadways, Bridges & Viaducts

INDUSTRIAL
Water/Wastewater, Power & Energy, Manufacturing

INSTITUTIONAL
Schools, Universities, Healthcare, Correctional

Sustainability

Calcium sulfoaluminate (CSA) cement technology provides a green alternative to traditional cements. The burning temperature needed to create CSA clinker is lower, with a less energy-intensive milling process required to grind it into cement. This less intensive manufacturing process reduces the overall consumption of energy and produces fewer carbon dioxide emissions. CSA cement also requires less limestone - the primary source of carbon dioxide released during the chemical sintering process.



32% Reduced carbon emissions during production vs. portland cement

65% Less consumption of natural resources and energy

2X the service life of portland cement concrete

CSA cement technology extends the life-cycle of a project by significantly reducing or eliminating the challenges related to fatigue life, shrinkage, cracking, and porosity. CSA cement improves the sustainability of construction materials by reducing raw material use, energy demand, and overall carbon footprint. CSA cement increases the longevity and durability of the concrete.

AVIATION
Runways, Taxiways, Aprons, Hangars

MINING & TUNNELING
Shotcrete, Pumpable Grout, Cavity Fill, Pipe Liners

GOVERNMENT
Federal, State & Local Agencies, Public Works

Service & Support

We support the demanding requirements of the design and construction communities. CTS Cement is the industry's trusted supplier for proven performance, high quality results, and expert technical support.

TRAINING

Our Technical Sales and Service Representatives provide hands-on Product Knowledge Sessions (PKs) covering a multitude of projects that can be completed with Rapid Set cement products. These PKs show contractors, homeowners, and do-it-yourselfers how to easily repair and restore their concrete.

SERVICE

Our award-winning customer service has raised the bar within the industry. We provide timely, efficient and personalized service in every aspect of our business. We are committed to providing an outstanding experience, from operations, engineering, technical support, sales, marketing, logistics and customer service.

TECHNICAL

The CTS Engineering and Technical Teams provides exceptional service and support, including materials testing, mix design assistance, specification support, and installation recommendations.

FIELD

From pre-construction meetings to site installations, CTS offers field support worldwide to ensure your projects are successful.

Valued Partnerships

Innovation, initiative, and valued partnerships remain central to our business. As an employee-owned company, we have a personal stake in helping you succeed. We have earned a strong reputation within the industry for providing outstanding products and support to the design and construction communities, including:

- Architects
- Engineers
- Owners & Developers
- Property Managers
- Public Works Teams
- General Contractors
- Specialty Concrete Contractors
  - Paving
  - Preservation
  - Renovation & Repair
  - Architectural Concrete
  - Polished Concrete

MARINE
Dams, Canals, Locks, Levees, Pilings

COMMERCIAL
Retail, Hospitality, Recreation, Arenas, Convention Centers

MIXED USE
Urban Development, Multi-Family, Residential

CONTACT US

We're here to help, whether you're building a new structure, engineering infrastructure, preserving an existing architectural build, repairing or restoring existing concrete elements, or preparing substrates for aesthetic finishes. Contact us for assistance with product selection, specifications, samples, mix designs, and more. CTS Cement's experienced team of engineers, material scientists, technical experts, and field representatives are available to support your next project.

(800) 929-3030
CTScement.com
info@CTScement.com

CTS Cement Manufacturing Corp.
12442 Knott St., Garden Grove, CA 92841
(800) 929-3030 • www.CTScement.com • info@CTScement.com

RAPID SET® ALL PRODUCTS

Build Fast. Build To Last

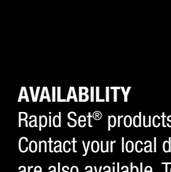
Rapid Set®

AVAILABILITY
Rapid Set® products are available through contractor and building supply dealers nationwide. Product availability may vary by location. Contact your local dealer for details. Bulk Rapid Set® Cement, Rapid Set® Latex Modified Concrete, and Shrinkage-Compensating Cement are also available. To find our products, call **1-800-929-3030** or visit ***CTScement.com***.

TECHNICAL SUPPORT
Contact Technical Support for assistance with product and application questions.
Tel: **1-800-929-3030** | Fax: **714-379-8270**
CTS Cement Manufacturing Corp.
12442 Knott St., Garden Grove, CA 92841

CTScement.com

CHEMICAL ANCHORS & ADHESIVES

	HIGHLIGHTS	TEST RESULTS	GEL TIME & LOAD READY
FAST ANCHORING & REPAIR ADHESIVE Multi-Purpose Two-Component Structural Epoxy A two-component, rigid structural epoxy anchoring repair adhesive designed to develop a strong, durable bond to concrete, masonry, and dissimilar building materials. Suitable for use in a wide range of general construction, repair and maintenance projects. ASTM C881 ▪ Type IV ▪ Grade 3 ▪ Class A, B, C	▪ Superior pull-out strength ▪ Use on cracked or uncracked concrete ▪ High chemical resistance ▪ Can be used for overhead applications ▪ Fill non-moving cracks and joints ▪ Bonds in water filled anchor holes	**Compressive Strength:** 7 days 11,360 psi (78.3 MPa) **Bond Strength:** 2 days 1,980 psi (13.6 MPa) 14 day 2,400 psi (16.5 MPa)	Working time 30 minutes (68° F) Load bearing ready in 10 hours (68° F)
 **ULTRA-FAST ANCHORING ADHESIVE Two-Component, High Strength Vinylester, Styrene-Free Structural Adhesive** A structural adhesive designed to develop a strong, durable bond to concrete and masonry materials. ICC ES ESR-4473 ▪ NSF 61 Certified LABC and LARC 2017 ▪ IBC and IRC 2017 Florida Building & Residential Code 2017 and 2014	▪ Bonds in water filled anchor holes ▪ High heat deflection temperature resistance ▪ Ideal in cold temperatures ▪ Use on cracked or uncracked concrete ▪ High chemical resistance ▪ Suitable in marine environments	**Compressive Strength:** 7 days 11,160 psi (77 MPa) **Bond Strength:** 2 days 1,230 psi (8.5 MPa) 14 day 2,320 psi (16 MPa) **Heat Deflection:** Long Term 248° F	Working time 6 minutes (70° F) Load bearing ready in 45 minutes (70° F)

CORE PRODUCTS

	USES	TEST RESULTS	THICKNESS & YIELD
 **RAPID SET® CEMENT Rapid Hardening Hydraulic Cement** High-performance, rapid hardening hydraulic cement that provides faster return to service, high strength, and increased durability. Ready for service in 1 hour. ASTM C1600 VRH State (DOT) and Local Approvals	▪ Interior/exterior projects ▪ Highway pavements ▪ Bridges ▪ Runways ▪ Tunnels ▪ Tilt-up ▪ Precast ▪ Sidewalks ▪ Floors and more	**Compressive Strength:** 1.5 hrs 4,500 psi (31.0 MPa) 3 hrs 5,500 psi (37.9 MPa) 24 hrs 7,000 psi (48.3 MPa) 28 days 8,000 psi (55.2 MPa)	Thickness and yield will vary by mix design. For small projects, start with one 88-lb bag, 176 lb of sand, 176 lb of 1/4" to 3/4" stone and about 4 gallons of potable water. Specific gravity 2.98 g/cm³
 **CEMENT ALL® Multi-Purpose Repair Material & Non-Shrink Grout** A high-performance, fast-setting, multi-purpose concrete repair material and non-shrink grout that is durable and formulated for long life. Achieves structural strength in 1 hour. ASTM: C1107, C928 R3, C387 Army Corps of Engineers CRD C621 LA Research and Report 24654 State (DOT) and Local Approvals	▪ General and structural concrete repair ▪ Doweling and anchoring ▪ Industrial grouting ▪ Formed work ▪ Vertical and horizontal trowel applications ▪ Ideal for highway, industrial and marine applications	**Compressive Strength:** 1 hr* 3,000 psi (20.7 MPa) 3 hrs 5,000 psi (34.5 MPa) 24 hrs 6,000 psi (41.4 MPa) 7 days 7,000 psi (48.3 MPa) 28 days 9,000 psi (62.1 MPa) *After final set	Up to 4" 55-lb bag yields 0.5 ft³ 25-lb box yields 0.2 ft³
 **MORTAR MIX High-Strength Structural Repair Mortar** A high-performance, fast-setting, high strength, multi-purpose repair material that is durable and formulated for long life. Achieves structural strength in 1 hour. ASTM: C928 R3, C387 State (DOT) and Local Approvals	▪ General and structural concrete repair ▪ Construction of pavements ▪ Stucco and plaster repair ▪ One-coat exterior plaster ▪ Underlayments ▪ Formed work ▪ Vertical and overhead applications	**Compressive Strength:** 1 hr* 2,500 psi (17.2 MPa) 3 hrs 4,000 psi (27.6 MPa) 24 hrs 5,000 psi (34.5 MPa) 7 days 5,500 psi (37.9 MPa) 28 days 6,500 psi (44.8 MPa) *After final set	1/2" to 6" 55-lb bag yields 0.5 ft³ 25-lb box yields 0.2 ft³
 **CONCRETE MIX Very Rapid Hardening Concrete** A high-performance, fast-setting, multi-purpose concrete repair material that is durable and formulated for long life. Ready for traffic in 1 hour. ASTM: C928 R2, C387 State (DOT) and Local Approvals	▪ General and structural concrete repair ▪ Construction of pavements ▪ Formed work ▪ Footings ▪ Setting posts ▪ Industrial floors ▪ Machine bases	**Compressive Strength:** 1 hr* 3,000 psi (20.7 MPa) 3 hrs 3,600 psi (24.8 MPa) 24 hrs 4,500 psi (31.0 MPa) 7 days 5,500 psi (37.9 MPa) 28 days 6,000 psi (41.4 MPa) *After final set	2" to 24" 60-lb bag yields 0.5 ft³

CONCRETE PHARMACY®
USE WITH RAPID SET® CEMENT PRODUCTS


SET CONTROL
A retarding admixture that extends the working time when placing and finishing Rapid Set® cement products.
0.9-oz packet


FLOW CONTROL
A flow enhancing additive that increases the fluidity of Rapid Set® cement products.
2.1-oz packet


FIBER
A 100% pure 1/2" polypropylene multifilament fiber containing no reprocessed materials that increases impact resistance and helps prevent shrinkage cracking in concrete, mortar, and grout mixes.
1.4-oz packet


BOND
A free-flowing redispersable polymer powder used in a variety of construction applications to improve bond strength and impact resistance.
2.3-oz packet


DARK
A pigment additive that darkens the color of cement. Use varying amounts to achieve desired shade of gray.
4.2-oz packet


LIGHT
A pigment additive that lightens the color of the mixture. Use varying amounts to achieve the desired tint.
2.5-oz packet


CORROSION INHIBITOR
An additive that extends the life of reinforced concrete structures in corrosive environments.
1.7-oz packet


FAST
An admixture designed to speed up the setting time of Rapid Set® cement products in cold weather environments.
2.8-oz packet


EISENWALL® SET CONTROL®
Use with Rapid Set Eisenwall.
A retarding admixture that extends the working time, allowing more time for placing and finishing.
5.7-oz packet

	USES	TEST RESULTS	THICKNESS & YIELD
			
DOT CEMENT **Industrial Grade, Fast-Setting Cement** A high-performance, rapid hardening hydraulic cement that is durable in wet environments and formulated for long life in freeze-thaw regions. Can be ready for traffic and loading in 1 hour. ASTM C1600 VRH State (DOT) and Local Approvals	▪ Pavement ▪ Repairing highways ▪ Bridge decks ▪ Airport pavement ▪ Industrial floors ▪ Parking garage decks ▪ Freezer floors ▪ Formed work, and more	**Compressive Strength:** 1.5 hrs 3,140 psi (21.6 MPa) 3 hrs 3,725 psi (25.7 MPa) 24 hrs 4,650 psi (32.1 MPa) 28 days 5,500 psi (37.9 MPa)	2" to 24" 50-lb bag yields 1.8 ft³ *in recommended concrete mix design*
			
DOT REPAIR MORTAR **High-Performance Concrete Repair Mortar** A high-performance, fast-setting concrete repair material that is durable in wet environments. Ideal where fast strength gain, high durability and low shrinkage are desired. Achieves structural strength in 1 hour. ASTM C928 R3 State (DOT) and Local Approvals	▪ Repairing highways ▪ Bridge decks ▪ Airport pavement ▪ Industrial floors ▪ Parking garage decks ▪ Freezer floors	**Compressive Strength:** 1 hr* 3,500 psi (24.1 MPa) 3 hrs 4,500 psi (31.0 MPa) 24 hrs 6,500 psi (44.8 MPa) 7 days 8,000 psi (55.2 MPa) 28 days 9,000 psi (62.1 MPa) *After final set	1/2" to 6" 70-lb bag yields 0.7 ft³ *Extend DOT Repair Mortar up to 50 lbs per 70-lb bag with aggregate (up to 3/4") for thicker applications up to 24"*
			
DOT REPAIR MIX **High-Performance Concrete Repair Material** A high-performance, fast-setting, multi-purpose repair material that is durable in wet environments and is ideal where fast strength gain, high durability and low shrinkage are desired. Ready for traffic and loading within 1 hour. ASTM C928 R3 California Test No. 551 State (DOT) and Local Approvals	▪ Concrete repair ▪ Highway repair ▪ Dowel bar retrofit ▪ Construction of pavements, bridges, parking decks, ramps, sidewalks, steps, joint repair and formed work	**Compressive Strength:** 1 hr* 3,300 psi (22.8 MPa) 3 hrs 5,000 psi (34.5 MPa) 24 hrs 7,000 psi (48.3 MPa) 7 days 7,500 psi (51.7 MPa) 28 days 9,500 psi (65.5 MPa) *After final set Based on ASTM C109 Mod. For ASTM C39 strength see datasheet.	1/2" to 2" 55-lb bag yields 0.5 ft³ *Extend DOT Repair Mix up to 100% by weight with aggregate (up to 3/4") for thicker applications up to 24".*
			
DOT CONCRETE MIX **High-Performance, Fast-Setting, Multi-Purpose Concrete Repair Material** A high-performance, polymer-modified, fast-setting, fiber-reinforced concrete repair material that is durable in wet environments. Includes Rapid Set® Corrosion Inhibitor and air entrainment additives to increase protection of embedded reinforcement and freeze-thaw durability. Achieves structural strength in 2 hours. ASTM C928 R3 State (DOT) and Local Approvals	▪ General and structural concrete repair ▪ Highway repair ▪ Footings ▪ Airport pavements ▪ Construction of pavements, bridges, parking decks, ramps, sidewalks, steps, joint repair and formed work	**Compressive Strength:** 2 hrs 3,000 psi (20.7 MPa) 24 hrs 5,000 psi (34.5 MPa) 7 days 6,000 psi (41.4 MPa) 28 days 6,500 psi (44.8 MPa)	2" to 24" 60-lb bag yields 0.42 ft³
			
ASPHALT RESURFACER **High-Performance, Cement-Based Repair Material for Asphalt** A high-performance, fast-setting, multi-purpose, cementitious material for asphalt repair that has been specially formulated with a polymer-modified blend of Rapid Set® Cement and additives designed to match the color of typical existing asphalt.	▪ Driveways ▪ Parking lots ▪ Roads ▪ Spall repairs ▪ Cracks ▪ Potholes and more	**Properties:** Working time of 20 minutes Drive on in 2 hrs	1/4" to 2" 25-lb box yields 0.32 ft³ or 15 ft² at 1/4" thick 50-lb bag yields 0.64 ft³ or 30 ft² at 1/4" thick *Extend Asphalt Resurfacer up to 75% by weight with 3/4" aggregate for thicker applications up to 24".*
			
ASPHALT REPAIR MIX **Fast-Setting, Cement-Based Pothole Fill and Repair Material** A high-performance, fast-setting, multi-purpose, cementitious material with coarse aggregate for asphalt repair that has been specially formulated with a polymer-modified blend of Rapid Set® Cement and additives designed to match the color of typical existing asphalt.	▪ Driveways ▪ Parking lots ▪ Roads ▪ Potholes and more	**Properties:** Working time of 15 minutes Drive on in 2 hrs	2" to 24" 50-lb bag yields 0.63 ft³

	USES	TEST RESULTS	THICKNESS & YIELD
			
MORTAR MIX PLUS **High-Strength Polymer-Modified Structural Repair Mortar** A high-performance, rapid-hardening, multi-purpose, polymer-modified concrete repair material with integral corrosion inhibitor, excellent workability, and strong adhesion. Formulated to a concrete gray color. ASTM: C928 R3, C387 State (DOT) and Local Approvals	▪ General and structural concrete repair ▪ Construction of pavements ▪ Marine applications ▪ Underlayments ▪ Formed work ▪ Horizontal, vertical and overhead applications	**Compressive Strength:** 1.5 hrs 2,000 psi (13.8 MPa) 3 hrs 3,500 psi (24.1 MPa) 24 hrs 5,500 psi (37.9 MPa) 7 days 6,000 psi (41.4 MPa) 28 days 7,000 psi (48.3 MPa)	1/2" to 6" 55-lb bag yields 0.5 ft³
			
V/O REPAIR MIX **Vertical Overhead Repair Material** A high-performance, polymer-modified blend of Rapid Set® Cement with additives and quality aggregates. Has integral corrosion inhibitor and self-curing technology. Fiber reinforced and concrete gray color. ASTM C928 R2 State (DOT) and Local Approvals	▪ General and structural concrete repair ▪ Marine applications ▪ Formed work ▪ Horizontal, vertical and overhead applications	**Compressive Strength:** 2 hrs 2,000 psi (13.8 MPa) 24 hrs 4,000 psi (27.6 MPa) 7 days 6,000 psi (41.4 MPa) 28 days 6,500 psi (44.8 MPa)	1/4" to 2" 50-lb bag yields 0.37 ft³ *Thicknesses up to 6" are acceptable for vertical and small spot repairs.*
			
FPP CONCRETE MIX **Form, Pour & Pumpable Concrete Mix** A high-performance, form and pour, pumpable, self-consolidating concrete repair material. FPP Concrete Mix is a blend of Rapid Set® hydraulic cement, high-performance additives and quality aggregates. Has integral corrosion inhibitor. ASTM: C1611, C39	▪ General and structural concrete repair ▪ Construction of pavements, formed work, footings, balconies, tunnels, roadways, elevated concrete slabs, parking decks and industrial floors	**Compressive Strength:** 4 hrs 2,500 psi (17.2 MPa) 24 hrs 3,500 psi (20.7 MPa) 7 days 6,000 psi (41.4 MPa) 28 days 6,500 psi (44.8 MPa)	2" to 24" 60-lb bag yields 0.44 ft³
			
WP MORTAR HP **High-Performance Cementitious Coating for Concrete and Masonry** A high-performance, polymer modified, cement coating that resists water intrusion in positive and negative side applications, can be exposed to hyrdrostatic pressure in 3-5 days, and cures to a concrete gray color. ASTM: C1583, DIN EN 14891	▪ Interior/exterior concrete and masonry surfaces ▪ Above and below grade ▪ Waterproof basements, foundations, retaining walls, tilt-up concrete, cast-in-place concrete, and precast concrete	**Compressive Strength:** 6 hrs 1,500 psi (10.3 MPa) 24 hrs 2,500 psi (17.2 MPa) 3 days 3,000 psi (20.7 MPa) 7 days 3,500 psi (24.1 MPa) 28 days 3,800 psi (26.2 MPa)	1/16" to 1/8" 50-lb bag yields 110 ft² at 1/16" thick
			
WATER STOP **Hydraulic Cement-Based Water Plug** A high-performance, fast-setting material designed to stop water leaks in concrete and masonry. Durable in wet environments, Water Stop is a blend of Rapid Set® hydraulic cement and specially graded fine aggregates. ASTM C109	▪ Cracks and holes in concrete surfaces such as walls, floors, swimming pools, cisterns, water tanks, basements, fountains, etc	**Compressive Strength:** 1 hr 2,500 psi (17.2 MPa) 3 hrs 3,500 psi (24.1 MPa) 24 hrs 4,000 psi (27.6 MPa) 7 days 5,500 psi (37.9 MPa) 28 days 6,000 psi (41.4 MPa)	Up to 2" *If hydrostatic pressure is below 2 psi (0.01 MPa), Water Stop can be applied as thin as 1/8" and as thick as 2".* 1 lb yields 14 in³ or will repair 26" of a 3/4" x 3/4" crack *Available in 25-lb box*
			
WUNDERFIXX® **Concrete Smoothing Compound** A high-performance, gray concrete smoothing and patching compound. Durable in wet environments with excellent bonding characteristics. Grit free, ultra-smooth finish. Patch, sand and paint the same day. ASTM C109	▪ Cosmetic patching ▪ Detailing and smoothing on tilt-up panels ▪ Precast and formed work ▪ Concrete block ▪ Other concrete and masonry surfaces ▪ Interior/exterior applications	**Compressive Strength:** 24 hrs 1,000 psi (6.9 MPa) 28 days 2,000 psi (13.8 MPa)	Up to 1/2" 50-lb bag yields 115 ft² at 1/16" thick 9-lb box yields 20.7 ft² at 1/16" thick
			
TILTWALLFIXX™ **Polymer-Modified, Portland-Based Concrete Smoothing Compound** A single-component concrete smoothing compound with extended working time, self-curing technology (SCT), and excellent bonding characteristics. ASTM C191	▪ Tilt-up panels ▪ Precast and formed work ▪ Concrete block ▪ Other concrete and masonry surfaces ▪ Interior/exterior applications	**Properties:** ▪ Pot Life: 90+ minutes ▪ Polymer modified: no latex needed	Up to 1/4" 50-lb bag yields 115 ft² at 1/16" thick

FLOORING

	USES	TEST RESULTS	THICKNESS & YIELD
 **TILTWALLFIXX™ TEXTURED** **Polymer-Modified, Portland-Based, Textured Compound** A single-component textured compound with self-curing technology (SCT) and excellent bonding characteristics. It has an extended working time to allow for larger mix sizes. ASTM: ASTM C1583, ASTM C191	▪ Tilt-up panels ▪ Precast and formed work ▪ Concrete block ▪ Other concrete and masonry surfaces ▪ Interior/exterior applications	**Properties:** ▪ Pot Life: 90+ minutes ▪ Polymer modified: no latex needed	1/16" to 1/4" 50-lb bag yields 155 ft² at 1/16" thick
 **ONEPASS®** **Patch, Sand & Paint in 90 Minutes** A high-performance, fast-setting, multi-purpose wall repair material and joint compound. Durable in wet environments. Mold and mildew resistant. ASTM: D3273, D3274	▪ Wallboard ▪ Cement board ▪ Magnesium oxide board ▪ Plaster ▪ Smooth stucco ▪ Masonry and other surfaces	**Mold Resistance:** 7 days 10 out of 10 14 days 10 out of 10 28 days 10 out of 10 (10 = No Mold)	Up to 1" 25-lb bag or box yields 77 ft² at 1/16" thick 9-lb box yields 28 ft² at 1/16" thick
 **TRU® SELF-LEVELING NATURAL & GRAY** **High-Performance Architectural Topping** Includes ultra-fine sand. Available in Natural and Gray. A polishable topping that provides long flow life, working time, and a smooth strong surface with high-bond strength. Grind wet or dry and polish in 24 hours. Outstanding clarity and gloss. *Note: Natural does not mean natural concrete color* ASTM C1708	**For polished floors in:** ▪ Schools ▪ Airports ▪ Warehouses ▪ Retail ▪ Restaurants ▪ Lobbies and more	**Compressive Strength:** 4 hrs 3,000 psi (20.7 MPa) 24 hrs 5,000 psi (34.5 MPa) 28 days 6,500 psi (44.8 MPa)	1/8" to 1-1/2" 50-lb bag yields 15 ft² to 16 ft² at 3/8" thick or 11 ft² to 12 ft² at 1/2" thick
 **TRU® SP NATURAL & GRAY** **Salt & Pepper Finish, High-Performance, Self Leveling, Architectural Topping** Includes decorative sand. Available in Natural and Gray. A high-flow topping with a specialized aggregate that creates a salt and pepper appearance on polished, decorative floors. Grind wet or dry and polish in 24 hours. Outstanding clarity and gloss. *Note: Natural does not mean natural concrete color* ASTM C1708	**For polished floors in:** ▪ Schools ▪ Airports ▪ Warehouses ▪ Retail ▪ Restaurants ▪ Lobbies and more	**Compressive Strength:** 4 hrs 2,000 psi (13.8 MPa) 24 hrs 4,000 psi (27.6 MPa) 28 days 6,500 psi (44.8 MPa)	3/8" to 1/2" 60-lb bag yields 16 ft² at 3/8" thick or 12 ft² at 1/2" thick
 **TRU® PC NATURAL & GRAY** **Polished Concrete Finish, High-Performance, Self-Leveling, Architectural Topping** Includes coarse decorative sand. Available in Natural and Gray. A high-flow topping that simulates polished concrete after grinding and polishing to expose the aggregate. Grind wet or dry and polish in 24 hours. Outstanding clarity and gloss. *Note: Natural does not mean natural concrete color* ASTM C1708	**For polished floors in:** ▪ Schools ▪ Airports ▪ Warehouses ▪ Retail ▪ Restaurants ▪ Lobbies and more	**Compressive Strength:** 4 hrs 2,800 psi (19.3 MPa) 24 hrs 5,000 psi (34.5 MPa) 28 days 7,000 psi (48.3 MPa)	3/8" to 1/2" 60-lb bag yields 16 ft² at 3/8" thick or 12 ft² at 1/2" thick
 **LEVELFLOR®** **Self-Leveling Underlayment** A self-leveling underlayment with long flow life. Foot traffic in 2-4 hours. Cover with finish flooring in 4-16 hours. ASTM C1708	▪ Self-leveling underlayment ▪ New floor and repair projects ▪ Interior/exterior	**Compressive Strength:** 24 hrs 3,000 psi (20.7 MPa) 7 days 3,500 psi (24.1 MPa) 28 days 5,000 psi (34.5 MPa)	1/8" to 2" 50-lb bag yields 24 ft² to 30 ft² at 1/4" thick or 12 ft² to 15 ft² at 1/2" thick *May be placed up to 5" thick when extended with aggregate.*
 **CR CONCRETE RESURFACER** **Resurface Worn, Old, Spalled Concrete** A cement-based polymer-modified mortar that can be used both indoors and outdoors to give the wear surface of concrete a new look. 30-minute working time. Foot traffic in 2-3 hours. Drive on in 4-8 hours. ASTM C109	▪ Repair old, damaged or discolored concrete ▪ Interior/exterior	**Compressive Strength:** 24 hrs 2,500 psi (17.2 MPa) 28 days 4,500 psi (31.0 MPa)	1/16" to 1/4" 50-lb bag yields 96 ft² at 1/16" thick *May be applied up to 1/2" in smaller areas.*
 **SKIM COAT** **Patch, Skim Coat & Underlayment** A smooth, sand-free, hydraulic cement-based material used under flooring for patching and skim coating on interior and exterior projects. Apply floor coverings in just 1 hour. Drive on 4-8 hours.	▪ Repair, level and smooth cement, and concrete substrates prior to installing floor coverings ▪ Repair uneven floors ▪ Interior/exterior	**Properties:** ▪ Excellent bond to concrete, brick, block and more ▪ Walk on in 1 hour ▪ Mold and mildew resistant	Up to 1" 20-lb bag yields 67 ft² at 1/8" thick

PRIMERS

	USES	TEST RESULTS	THICKNESS & YIELD
 **ACRYLIC PRIMER** **High-Adhesion Acrylic Primer** A concentrated, acrylic primer that improves the adhesion of Rapid Set® self-leveling flooring products to prepared concrete. Acts to prevent pinholes from forming in the finished surface.	▪ Seals porous concrete to prevent pinholes ▪ Improves adhesion	**Properties:** ▪ Concentrated formula ▪ Extend with water ▪ Accepts topping in 1-24 hrs ▪ Light blue color	2 mils 1 gallon yields 400 ft² - 600 ft²
 **TXP™ FAST** **Fast Cure, Two Component, Alkali Resistant Epoxy Primer** Provides excellent substrate wetting capabilities to promote penetration and adhesion. Ready for overlayment in 4-6 hours. ASTM: D2196, D2240, D695, D790	▪ Seals concrete, minimizes pinholes in overlayment ▪ Excellent adhesion to concrete	**Properties:** ▪ Consists of resin and hardener ▪ High bond strength ▪ Low viscosity/deeply penetrating ▪ 30-35 minute working time ▪ Foot traffic in 4-6 hrs ▪ Tack free in 3 hrs ▪ Substrate MVER up to 10 lbs	10 to 12 mils 3-gallon kit yields 480 ft² at 10 mils thick or 400 ft² at 12 mils thick
 **TXP™ SUPERFAST** **Super Fast Cure, 100% Solids, Two Component, Alkali Resistant Epoxy Primer** Provides excellent substrate wetting capabilities to promote penetration and adhesion. Ready for overlayment in 2.5 hours. ASTM: D2196, D2240, D695, D790	▪ Seals concrete, minimizes pinholes in overlayment ▪ Excellent adhesion to concrete	**Properties:** ▪ Consists of resin and hardener ▪ High bond strength ▪ Low viscosity/deeply penetrating ▪ 10 minute working time ▪ Foot traffic in 2.5 hrs ▪ Tack free in 2 hrs ▪ Substrate MVER up to 10 lbs	10 to 12 mils 1-gallon kit yields 160 ft² at 10 mils thick 133 ft² at 12 mils thick

STUCCO

	USES	TEST RESULTS	THICKNESS & YIELD
 **EISENWALL®** **Premium Cement for Exterior Plastering** Use in exterior plastering and stucco applications. Apply full thickness in a single application. Scratch, brown, and color the same day. ASTM C1328* ESR-2671 ▪ UBC 25-1 LA RR 25358 State and Local Approvals	**For installation over:** ▪ Masonry ▪ Concrete ▪ Fiberboard ▪ Gypsum ▪ Wood ▪ Cement-based sheathing	**Compressive Strength:** 6 hrs 1,500 psi (10.3 MPa) 24 hrs 2,500 psi (17.2 MPa) 28 days 3,500 psi (24.1 MPa)	3/8" to 2" 88-lb bag yields 5 yd² at 3/4" thick **This product is not a portland cement and may have less than 90 minutes set time.*
 **STUCCO MIX** **Premium Pre-Mixed Stucco for Exterior Plastering and Stucco** A premium blend of Rapid Set® Cement, quality plaster sand and high-performance additives. Apply full-depth in a single application. Scratch, brown, and color coat in one day. ASTM C1328* ESR-2671 ▪ UBC 25-1	**For installation over:** ▪ Masonry ▪ Concrete ▪ Fiberboard ▪ Gypsum ▪ Wood ▪ Cement-based sheathing	**Compressive Strength:** 6 hrs 1,000 psi (6.9 MPa) 24 hrs 1,800 psi (12.4 MPa) 28 days 2,900 psi (19.9 MPa)	3/8" to 2" 50-lb bag yields 7.0 ft² at 3/4" thick **This product is not a portland cement and may have less than 90 minutes set time.*
 **STUCCO PATCH** **Premium, Fast-Setting Stucco Repair Material** A premium, fast-setting stucco repair material, formulated with Rapid Set® hydraulic cement, advanced polymers and high quality aggregates. Apply full-depth in a single application. Prime and paint after approximately 2 hours. Maintains paint gloss and color.	▪ Repair cracks, holes and voids in stucco surfaces ▪ Window and door installations ▪ Interior/exterior stucco surfaces ▪ Compatible with most primers, paints, and topcoats	**Compressive Strength:** 24 hrs 2,500 psi (17.2 MPa)	1/8" to 1" 10-lb box yields 0.1 ft³ 25-lb bag yields 0.2 ft³ 50-lb bag yields 0.4 ft³

GROUTING

	USES	TEST RESULTS	THICKNESS & YIELD
 **ULTRAFLOW® 4000/8** **Non-Shrink Precision Grout** A high-performance, non-shrink precision grout with long flow life and rapid strength gain. Fluid for 30 minutes. Can be mixed to any consistency from damp pack to fluid with an extended working time to allow for large placements. ASTM C1107 Army Corps of Engineers CRD C621	▪ Structural and non-structural applications ▪ Precision grouting under base plates, precast components, machinery and equipment bases, keyway joints, load bearing pads, columns, anchor bolts, dowel rods and other indoor/outdoor non-shrink applications	**Compressive Strength:** 8 hrs 4,000 psi (27.6 MPa) 24 hrs 6,500 psi (44.8 MPa) 7 days 8,000 psi (55.2 MPa) 28 days 8,500 psi (58.6 MPa)	Up to 2" 55-lb bag yields 0.5 ft³ *If greater than 2" thick, may be extended with 3/8" pea gravel.*
 **CTS CONSTRUCTION GROUT** **Multi-Purpose, Non-Shrink Grout** A versatile, non-shrink grout for structural and non-structural applications that can be mixed to any consistency from damp pack to fluid. Ready for loading in 24 hours. ASTM C1107 State (DOT) and Local Approvals	▪ Structural and non-structural applications ▪ Precision grouting, base plates, precast components, machinery and equipment bases, anchor bolts, keyway joints, load bearing pads and other non-shrink applications	**Compressive Strength with Fluid Consistency:** 24 hrs 2,500 psi (17.2 MPa) 7 days 7,000 psi (48.3 MPa) 28 days 9,000 psi (62.0 MPa)	Up to 2" 50-lb bag yields 0.38 ft³ at flowable grout consistency *If greater than 2" thick, may be extended with 3/8" pea gravel.*

PRODUCT SELECTION GUIDE

APPLICATION BY PRODUCT

Rapid Set KOMPONENT

by CTS Cement Manufacturing Corp.

PRODUCT SELECTION GUIDE

APPLICATION BY PRODUCT

	Airport Pavement Repairs	Airport Paving	Anchoring	Asphalt Repair	Base Plate Grouting	Bridge Deck Construction	Bridge Deck Repair	Casting, Ornamental & Architectural	Chemical Anchors & Adhesives	Cement Board Installation	Concrete Floor Overlay	Concrete Repair,Architectural & Cosmetic	Concrete Repair, Seawall	Concrete Repair, Structural (0"-4")	Concrete Repair, Structural (1/2"-6")	Concrete Repair, Structural (2"-24"+)	Concrete Repair, Vertical & Overhead	Containment Tanks	Crack Repair	Doweling	Drywall Install & Repair	Equipment Grouting	Floor Leveling	Formed Concrete	Freezer Floor Repair	Grouting, General	Grouting, Non-Shrink	Highway Pavement Repairs	Highway Paving	Industrial Slabs	Manhole Repair	Masonry Applications	Mining Applications	Mortar Beds	Overlay, Concrete Pavement	Parking Deck Repairs
Acrylic Primer											✓	✓											✓													
Asphalt Repair Mix	✓			✓																							✓								
Asphalt Resurfacer	✓			✓																							✓								
Cement All®	✓		✓		✓		✓	✓			✓	✓	✓	✓			✓		✓	✓		✓	✓		✓	✓	✓				✓	✓			✓
Concrete Mix	✓						✓	✓					✓			✓								✓	✓			✓			✓		✓			✓
Concrete Resurfacer											✓	✓															✓							✓	✓
CTS Construction Grout					✓									✓	✓	✓						✓				✓	✓								
DOT Cement	✓	✓				✓	✓						✓			✓								✓				✓	✓		✓		✓		✓	✓
DOT Concrete Mix	✓						✓	✓			✓		✓			✓								✓	✓			✓			✓					✓
DOT Repair Mix	✓		✓		✓		✓				✓		✓		✓	✓				✓		✓	✓	✓	✓	✓	✓	✓			✓		✓			✓
DOT Repair Mortar	✓						✓				✓		✓		✓	✓							✓	✓	✓			✓			✓		✓			✓
Eisenwall®																																			
Fast Anchoring & Repair Adhesive									✓										✓																
Flowable Fill	✓	✓															✓										✓	✓		✓					
HTF Shotcrete																	✓															✓			
Komponent®		✓				✓												✓						✓					✓			✓		✓	
LevelFlor®																							✓												
Low-P™ Cement	✓	✓				✓	✓				✓		✓	✓	✓	✓			✓					✓				✓	✓					✓	✓
Low-P™ FA1 Cement	✓	✓				✓	✓				✓		✓	✓	✓	✓			✓					✓				✓	✓					✓	✓
Low-P™ Repair Mortar	✓	✓					✓				✓		✓	✓	✓	✓			✓					✓				✓							✓
Low-P™ Shotcrete							✓										✓																		
Mortar Mix							✓				✓		✓		✓		✓					✓			✓						✓	✓	✓	✓	✓
Mortar Mix Plus							✓				✓		✓		✓		✓					✓			✓						✓	✓	✓	✓	✓
OnePass®										✓											✓														
Rapid Set® Cement (bulk)	✓	✓				✓	✓	✓					✓	✓	✓	✓		✓						✓	✓			✓	✓	✓				✓	✓
Rapid Set® Cement (bags)	✓	✓				✓	✓	✓					✓	✓	✓	✓								✓	✓			✓							✓
Skim Coat																							✓												
Stucco Mix																																			
Stucco Patch																																			
System-K™		✓				✓												✓						✓					✓			✓		✓	
TRU® PC											✓	✓											✓												
TRU® Self-Leveling											✓	✓											✓												
TRU® SP											✓	✓											✓												
TXP™ Fast Epoxy Primer											✓	✓											✓												
TXP™ SuperFast Epoxy Primer											✓	✓											✓												
Type-K		✓				✓												✓						✓					✓			✓		✓	
Ultra-Fast Anchoring Adhesive									✓										✓																
UltraFlow® 4000/8					✓																	✓				✓	✓					✓			
V/O Repair Mix							✓					✓	✓	✓			✓													✓	✓				✓
Water Stop																																			
WP Mortar HP												✓																							
WunderFixx®										✓		✓					✓																			

PRODUCT SELECTION GUIDE

APPLICATION BY PRODUCT

	Parking Structures, New	Parking Structures, Repair	Plaster Repair	Plastering, Exterior	Plastering, Interior	Post Setting	Sewer	Shotcrete	Shrinkage Compensating Concrete	Sidewalks, Ramps & Steps	Skim Coating Concrete & Block	Slabs, New	Slabs, Repair	Spackling	Spall Repair	Stucco Repair	Tile Setting	Tilt-up Concrete Patching	Underlayment	Utility Trenches	Water Plug	Water Intrusion	Water Treatment Plants, New
Acrylic Primer																			✓				
Asphalt Repair Mix		✓																					
Asphalt Resurfacer		✓																					
Cement All®		✓					✓			✓	✓		✓		✓		✓	✓	✓				
Concrete Mix		✓				✓	✓			✓		✓	✓		✓					✓			
Concrete Resurfacer		✓								✓			✓										
CTS Construction Grout		✓																					
DOT Cement												✓								✓			✓
DOT Concrete Mix		✓				✓	✓			✓			✓		✓								
DOT Repair Mix							✓						✓		✓					✓			
DOT Repair Mortar							✓						✓		✓					✓			
Eisenwall®			✓	✓	✓											✓							
Fast Anchoring & Repair Adhesive																							
Flowable Fill							✓													✓			
GXP General Epoxy Primer															✓				✓				
HTF Shotcrete								✓															
Komponent®	✓								✓			✓											✓
LevelFlor®																			✓				
Low-P™ Cement	✓	✓					✓					✓	✓										
Low-P™ FA1 Cement	✓	✓					✓					✓	✓										
Low-P™ Repair Mortar	✓	✓									✓		✓	✓	✓	✓					✓		
Low-P™ Shotcrete								✓															
Mortar Mix			✓	✓	✓						✓		✓		✓	✓			✓				
Mortar Mix Plus			✓	✓	✓						✓		✓		✓	✓			✓				
OnePass®					✓						✓			✓									
Rapid Set® Cement (bulk)	✓	✓					✓					✓	✓							✓			✓
Rapid Set® Cement (bags)		✓										✓	✓							✓			
Skim Coat											✓								✓				
Stucco Mix			✓	✓	✓											✓							
Stucco Patch			✓	✓												✓					✓		
System-K™	✓								✓			✓											✓
TRU® PC																			✓				
TRU® Self-Leveling																			✓				
TRU® SP																			✓				
TXP™ Fast Epoxy Primer																			✓				
TXP™ SuperFast Epoxy Primer																			✓				
Type-K	✓								✓			✓											✓
Ultra-Fast Anchoring Adhesive																							
UltraFlow® 4000/8																							
V/O Repair Mix		✓					✓			✓					✓			✓					
Water Stop																					✓		
WP Mortar HP											✓											✓	
WunderFixx®				✓	✓						✓							✓					

CEMENT TECHNOLOGY

WHAT IS RAPID SET® & KOMPONENT

WHAT IS RAPID SET® CEMENT?

RAPID SET® CEMENT is an advanced Calcium Sulfoaluminate cement (CSA) produced by CTS Cement Manufacturing Corporation. It is a high-performance, hydraulic cement that provides structural strength in one hour, reduced shrinkage, low permeability and superior resistance to sulfate attack. Rapid Set Cement is a standalone cement that, unlike other CSA cements, does not require binders or additives to achieve its superior performance. It has a low carbon footprint and is a highly sustainable alternative to portland cement.

OVER 1 MILLION CUBIC YARDS

of Rapid Set® Cement concrete pavement has been placed in major airports and highways worldwide.

Rapid Set® Cement is blended and packaged into a wide range of high-performance products

Products include: Structural repair mortars, concretes, self-leveling products, non-shrink grouts, exterior plasters, and other advanced cementitious materials

The need for a better cement technology drove the research and development that produced Rapid Set® Cement.

NOT ALL CEMENTS ARE ALIKE

There are inherent differences between portland cement and Rapid Set®

PORTLAND CEMENT

Portland cement has been the standard for many years, but it has inherent challenges. It shrinks excessively, cannot be accelerated without negative side effects, can be susceptible to attack by prevalent chemicals, and reacts destructively with certain aggregates.

RAPID SET® CEMENT

Using products based on Rapid Set Cement helps solve these problems.

HIGH PERFORMANCE

Differences in raw materials and manufacturing processes result in a higher performance chemistry. The calcium sulfoaluminate (C_4A_3S) hydrates quickly resulting in beneficial early ettringite formation. Ettringite is a strong, needle-like crystal that gives the material its quick-setting and high-early strength properties. Rapid Set Cement also contains one of the highest percentages of dicalcium silicate (C_2S), which provides excellent long-term strength. Rapid Set Cement is highly resistant to sulfate attack. It contains no tricalcium aluminate (C_3A), which is a major contributor to sulfate attack in portland cement concrete. When Rapid Set Cement is used in concrete, it provides superior performance in terms of reduced permeability and low shrinkage.

Traditionally, when fresh concrete is placed, the heavier particles settle and displace the mix water. The water then forms capillaries as it rises to the surface as bleed water. After the concrete has hardened, these capillaries become routes of entry for substances that attack the concrete and reinforcing steel.

As Rapid Set Cement concrete is placed, the ettringite crystals rapidly consume mix water and create a three-dimensional lattice. This stops the settling and displacement process, which minimizes capillary formation and reduces permeability, resulting in more durable concrete.

Rapid Set Cement also uses mix water more efficiently than portland cement. This allows the placement of the concrete in a very workable consistency without the detrimental effects of excess mix water. Portland cement will only consume about half the mix water, leaving the excess water to evaporate over time, which results in drying shrinkage. At modest water-to-cement (w/c) ratios, Rapid Set Cement will consume essentially all of the water, minimizing drying shrinkage.

DID YOU KNOW?

Rapid Set® cement has been proven in service since 1960.

RAPID SET® INNOVATION

Rapid Set Cement technology is a greener alternative to traditional cements. CTS material scientists have innovated the cement chemistry and manufacturing processes to reduce energy consumption, use recycled industrial by-products, and improve the lifecycle of cement applications. This innovative approach provides a higher performance cement, reduces the carbon footprint, and makes a safer, and more sustainable world.

Rapid Set cement chemistry requires less limestone, reducing carbon dioxide emissions, and re-purposes recycled content to divert industrial waste from landfills. The manufacturing process is more energy efficient by lowering the kiln temperature and using less energy during grinding.

The kiln is operated at a lower temperature consuming less fuel. The grinding process is more efficient requiring less energy. and requires less energy during the milling process.

During manufacturing, by using recycled content and post-industrial resources, industrial waste is diverted from landfills.

Rapid Set cement technology extends the lifecycle of a project by significantly reducing or eliminating the challenges related to fatigue life, shrinkage, cracking, and porosity. Rapid Set cement improves the sustainability of construction materials by reducing raw material use, energy demand, and overall carbon footprint.

WHAT IS KOMPONENT?

KOMPONENT® is a high-performance line of shrinkage-compensating cement solutions for concreting and grouting applications. Komponent products are based on Type K cement and are engineered to counteract drying shrinkage and structural movement due to volume change. It minimizes or eliminates drying shrinkage cracking, provides 30-40% greater abrasion resistance, reduces permeability, and improves sulfate resistance.

TYPE K
SHRINKAGE-COMPENSATING CEMENT

Type K shrinkage-compensating cement technology has been successfully used in concrete designs since the early 1960s. It provides a proven integral approach to improving concreting and grouting applications. Type K Cement incorporates advanced calcium sulfoaluminate (CSA) cement technology, which improves the cement paste itself. Type K has a long history of success in post-tensioned structures, chemically pre-stressed concrete, slabs-on-grade, concrete containment, and other cast-in-place elements where overall higher performance and extended service life were required.

MAXIMIZE VALUE

Komponent offers significant value in a wide variety of structural and non-structural designs and geotechnical applications. Value can be achieved with larger, more monolithic placements, up to 95% fewer control joints, reduced mobilizations, formwork, and waterstops, reduced temperature and shrinkage steel, and more.

Komponent technology is designed to eliminate common and costly challenges related to drying shrinkage cracking that result in deterioration and failure. Its advanced hydration mechanism prevents edge curling and corner breaks, overcomes restraint-to-shortening challenges, and minimizes overall repair and maintenance costs.

Project time and material costs can be saved during construction and in-service, minimizing life-cycle costs while maximizing operational efficiency. Komponent is engineered to provide the best overall value in durable, sustainable concrete designs.

KOMPONENT

1

Komponent is an expansive, hydraulic cementitious additive blended with local portland to create Type K Cement. It provides a cost-effective approach to producing shrinkage-compensating concrete, low shrinkage concrete, and non-shrink grout materials. Komponent can be added at the production plant or on the job site in proportions that achieve the specified amount of shrinkage compensation.

TYPE K

2

Type K Cement is a pre-blended cement (conforming to ASTM C845) consisting of Komponent and Type II portland cement. Pre-blended material is ideal for smaller projects or locations where production versatility is limited. It is used to make shrinkage-compensating concrete, low shrinkage concrete and non-shrink grout materials.

SYSTEM-K

3

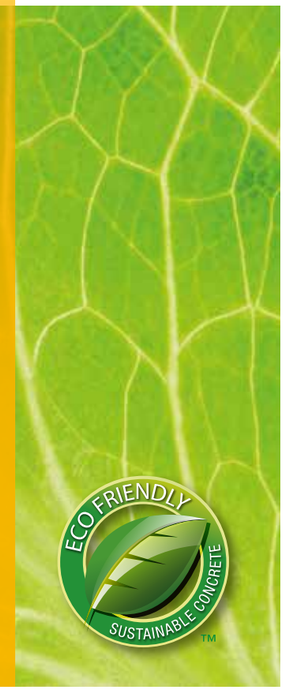
System-K™ is a microfiber reinforced, shrinkage-compensated floor or topping slab system used in non-structural concrete designs with minimal reinforcement. It incorporates synthetic monofilament K-Fiber™ and Komponent with local portland cement and aggregates. These short, synthetic K-Fibers provide sufficient integral restraint that minimizes steel reinforcement requirements, and also improve the durability of the finished concrete. System-K offers a cost effective alternative to traditionally reinforced concrete slabs.

ADVANTAGES OF KOMPONENT

- Up to 95% fewer contraction/control joints
- Larger, more monolithic slab and wall placements (up to 30,000+ ft^2)
- Increased joint spacing (up to 300 ft)
- Increased L/W ratio (up to 3:1)
- Prevent curling, shrinkage cracking, corner breaks and edge spalls
- 30-40% greater abrasion resistance
- No special structural re-design required
- Eliminate restraint-to-shortening challenges
- Eliminate pour/delay strips
- Thinner slabs and walls are viable
- Reduce temperature and shrinkage steel
- Reduce load transfer reinforcement
- Reduce waterstops, and minimize leakage and seepage points in containment structures

SUSTAINABILITY

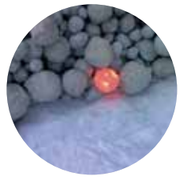
ENVIRONMENTAL
POLICY STATEMENT



OUR COMMITMENT TO OUR CUSTOMERS, EMPLOYEES, AND THE PLANET:

CTS Cement Manufacturing Corp. manufactures Rapid Set® Cement in a responsible manner to protect natural resources, minimize carbon dioxide (CO_2) emissions, and reduce potential environmental and health hazards.

IMMEDIATE & LONG-TERM
ENVIRONMENTAL BENEFITS



IMMEDIATE
REDUCED CARBON EMISSIONS

Cement is made by heating limestone with other materials in a kiln. The resulting hard substance, called “clinker,” is ground with a small amount of gypsum to make the cement. Rapid Set® Cement is more environmentally friendly than portland cement because it:

- Consumes 20% less limestone per ton, which lowers consumption of valuable natural resources as well as the amount of fossil fuel required to extract raw materials.
- Is processed at a lower temperature, which provides a second reduction in fossil fuel use.

LONG-TERM
GREATER DURABILITY = LESS MAINTENANCE

Rapid Set® Cement concrete has a proven record of field performance that exceeds the normal useful life span of portland cement concrete. It is inherently more resistant to deterioration caused by:

- Alkali-silica reaction (ASR)
- Chlorides
- Freeze-thaw cycles
- Shrinkage cracking
- Sulfates

33%

Rapid Set® Cement's carbon footprint is 33% less than portland cement's

LOWER CO_2 EMISSIONS

Pounds of carbon dioxide released into the atmosphere per pound of cement produced:

- Rapid Set® Cement: 0.61
- Portland cement: 0.90

We monitor the operations of our cement production plants to ensure compliance with federal and state regulations, as well as professional standards of good industry practices. Our technologies and operating procedures are designed to minimize health and safety risks. We provide a safe working environment, and ensure that employees are properly trained and have the right safety and emergency equipment.

ENVIRONMENTAL CLAIM
A GREENER HYDRAULIC CEMENT

Rapid Set® Cement is a greener hydraulic cement primarily because it generates far less carbon dioxide (CO_2) than portland cement in its manufacturing process. Emissions of carbon dioxide gas result from two aspects of the high-temperature production process:

CEMENT KILN

Raw materials (limestone, clay, etc.) decompose, releasing large amounts of carbon dioxide gas into the atmosphere.

FUEL COMBUSTION

The combustion of fuel (generally coal) with air in the cement kiln also releases carbon dioxide, much the same as carbon dioxide gas is emitted from the exhaust pipe of a vehicle.

In the case of portland cement, approximately 40% of emitted CO_2 results from the burning of the fuel in a kiln, and 60% comes from the decarbonation of the limestone.1 A recent estimate for carbon dioxide emissions for portland cement production is 0.9 pounds of CO_2 per pound of ground portland cement.[2]

1. Green in Practice: Technical Brief 102, 2008 PCA Publication, http://www.concretethinker.com/papers.aspx?DocID=312 • 2. Manufacturing Fact Sheet, 2008 PCA Briefing Kit Publication, http://www.cement.org/Briefingkit/manu_facts.asp • 3. Klemm Report 2008

ANALYSIS

Rapid Set® Cement manufacturing's raw materials composition, pyroprocessing techniques, and grinding has established a baseline emission rate of 0.61 pounds of CO_2 per pound produced, broken down as follows:[3]

- **0.21 pounds of CO_2 per pound of cement from fuel (coal) combustion because its burning temperature is approximately 220°C lower than that of portland cement processes.**
- **0.40 pounds of CO_2 per pound of cement from thermal decarbonation of calcium carbonate (limestone).**

Rapid Set® Cement and concrete lowers emissions of greenhouse gases and smog-producing nitrogen oxides while extending pavement's lifespan, leading to lower frequency of repairs and replacement.

A DIFFERENT TYPE OF CLINKER ALSO LESSENS ENVIRONMENTAL IMPACTS

The reduced burning zone temperature needed to form Rapid Set® clinker has the additional advantage of producing lesser amounts of smog-producing oxides of nitrogen.

The softer and more friable nature of Rapid Set® clinker also lends itself to much easier grinding and a lower grinding mill energy consumption.

CTS Rapid Set® Cement
A "Green" Hydraulic Cement

Reducing CO_2 emissions by 32% - 36% over conventional portland cement

BY WALDEMAR A. KLEMM

Rapid Set® Cement differs from ordinary portland cement in most high performance construction applications, such as concrete highways, runways, bridges, and slab floors, where superior durability and rapid strength gain are required. Rapid Set® gains strength far faster than portland cement and in many instances can be put into service in as little time as one hour. Rapid Set® reaches compressive strengths in one day that an equivalent portland cement mix would require one month to achieve. For larger projects, Rapid Set® concrete mixtures may be batched using conventional ready mix equipment.

CARBON FOOTPRINT

More importantly, Rapid Set® has a much smaller **"carbon footprint"** than portland cement. This means that in its manufacturing process, with normal cement plant production equipment, it generates far less carbon dioxide (CO_2) than portland cement emits during its production process. Carbon dioxide is a **"Greenhouse Gas"** and is a major contributor to global warming and climate changes. Thus, Rapid Set® is a **"Green"** hydraulic construction material that is far superior in most respects to portland cement.

LOWER PRODUCTION TEMPERATURES

There are a number of reasons for the exceptional "Green" characteristics of Rapid Set® cement and concrete. In the case of cement production practice, the emissions of carbon dioxide gas result from two aspects of the high-temperature manufacturing process.

First, at the extremely high temperatures of a rotary cement kiln, the cement raw mix materials (limestone, clay, etc.) decompose and chemically react to form a marble-sized product called "cement clinker", which is subsequently cooled and then ground into face-powder fineness to produce the final cement product. During the heating or pyroprocessing stage, the limestone (calcium carbonate) constituent of the raw material kiln feed mixture loses its carbon content as evolved carbon dioxide.

Secondly, the combustion of fuel (generally coal) with air in a cement kiln, also releases carbon dioxide as a combustion product, much the same as carbon dioxide gas is emitted from the exhaust pipe of a vehicle that is burning gasoline or diesel fuel.

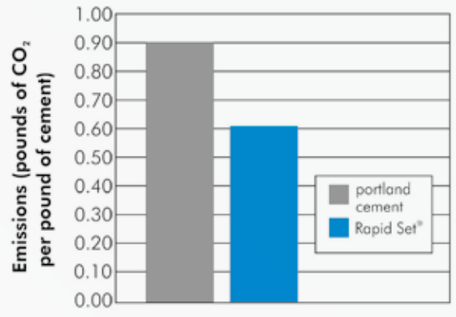


Fig. 1: CO_2 Emissions of portland cement compared to Rapid Set® cement

In the case of portland cement production, approximately 40% of emitted CO_2 results from the burning of the fuel in a kiln, and the remaining 60% of CO_2 comes from the decarbonation of the limestone in the kiln feed raw materials. World-wide, the emission of carbon dioxide from cement production is equivalent to about one pound of CO_2 per one pound of cement clinker that is burned. However, in portland cement production the clinker factor usually is 0.95, meaning that the portland clinker is interground into cement in large grinding mills with about 5% gypsum to control the cement or concrete setting process when water later is added to the dry mixture. In a recent change to the ASTM *Standard Specification for Portland Cement* (C 150), further additions of up to 5% limestone are permitted, with the gypsum, in the final grinding step. With these additional dilutions to the portland clinker constituent, the clinker factor may be somewhat lower. In fact, a recent estimate for carbon dioxide emissions for portland cement production in the U.S. is 0.9 pounds of CO_2 per pound of ground portland cement (Fig. 1).

The manufacturing of Rapid Set® clinker demonstrates significant reductions in North American and potentially global emissions of carbon dioxide from cement production. An analysis of Rapid Set® manufacturing raw materials composition, pyroprocessing techniques, and cement grinding has established **a baseline emission of 0.61 pounds of CO_2 per pound of Rapid Set® cement produced (Fig. 1).**

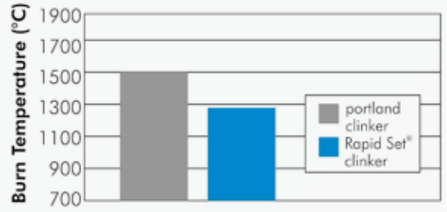


Fig. 2: Clinker burning temperature of portland cement and Rapid Set® cement

Rapid Set® exhibits a significantly smaller carbon footprint which is 60% to 70% the size of that produced by most portland cements made in the United States.

ENVIRONMENTAL ADVANTAGES

• Rapid Set® pyroprocessing emits 0.21 pounds of CO_2 per pound of cement from fuel (coal) combustion.

• Rapid Set® pyroprocessing emits 0.40 pounds of CO_2 per pound of cement from thermal decarbonation of calcium carbonate (limestone).

• Rapid Set® clinker is directly ground into cement with only very minimal, if any, additions of gypsum.

• Rapid Set® cement is never blended with portland cement to produce a fast-setting or rapid strength-developing product.

• Although Rapid Set® is somewhat similar to portland cement in mineralogical composition, its main constituents are calcium sulfoaluminate, dicalcium silicate, and anhydrous calcium sulfate. No tricalcium silicate is formed.

• The burning temperature of Rapid Set® clinker is 1,280°C (2,326°F), which is significantly lower than portland clinker burning temperatures (Fig 2).

• The average burning temperature of portland clinker is about 1,500°C (2,732°F) or more (Fig 2).

• The low-sulfur coal used to produce Rapid Set® clinker has an energy value of about 12,300 BTU per pound of coal, and a fixed carbon content of about 48%.

• The reduced burning zone temperature needed to form Rapid Set® clinker has the additional advantage of producing lesser amounts of smog-producing oxides of nitrogen.

• The softer and more friable nature of Rapid Set® clinker also lends itself to much easier grinding and, therefore, a lower grinding mill energy consumption.

• Hardened Rapid Set® concrete is much more durable than portland cement concrete, and has a particularly greater resistance to sulfate or other types of chemical attack. Due to its very rapid strength producing ettringite formation, lower porosity, and subsequent internal self-desiccation, Rapid Set® is extremely impervious to carbonation, freeze-thaw susceptibility, and acid rain leaching. Thus, it has a proven record of field performance that exceeds the normal useful life span of portland cement concrete.

In summary, Rapid Set® cement not only is a greener cement due to its smaller carbon footprint than portland cement when manufactured, but also is a cement, mortar, or concrete that exhibits superior performance, durability, and an extended lifetime under most ambient temperature and field usage conditions.

Waldemar A. Klemm is a consultant in the cement industry. He has over 40 years of experience in the cement industry in plant process, chemistry, research and development activities, and environmental studies. He has authored 40 technical reports and scientific papers on clinkering chemistry, cement hydration, admixture research, cement manufacturing, and environmental analyses.

Waldemar holds patents on expansive cement production and fluoride mineralizers for clinkering. He has been an invited speaker at prestigious cement and concrete conferences and symposiums. He is a member of the American Chemical Society; the American Society for Testing and Materials (ASTM); and Fellow of the American Ceramic Society.

INDUSTRY REPORTING

THIRD-PARTY ASSESSMENT

ENVIRONMENTAL PRODUCT DECLARATION (EPD)

A Type III (product-specific) environmental product declaration (EPD) is available for Rapid Set® Cement, confirming its lower cradle-to-gate warming potential (GWP) relative to portland cement.

Contact us at **info@ctscement.com** or **www.ctscement.com/contact** for more information.

LEED COMPLIANCE

Rapid Set® Cement products can contribute points to the following U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) performance areas.
For location valuation factor (LVF), 50% to 100% (by weight) of our cement products are extracted, manufactured, and purchased within 100 miles of our production facilities.

MATERIALS AND RESOURCES (MR)	INDOOR ENVIRONMENTAL QUALITY (EQ)	DURABLE MATERIALS (MR) (CANADA)	HEAT ISLAND EFFECT (SS)
Location Valuation Factor, 10% (1 point)	Low-Emitting Materials, Paints and Coatings (1 point)	High Durability for Extended Life Cycle (1 point)	Solar Reflective Index greater than 29 (1 point)
Location Valuation Factor, 20% (1 point)			

CTS PRODUCTION FACILITIES		
Dixon, CA	Gardena, CA	Tracy, CA
Mexico, MO	Chicago, IL	Bayville, NJ
Fort Smith, AR	Harrisonville, MO	Juarez, MX
Bethlehem, PA	Dupont, WA	

Please contact CTS to verify production locations for specific products.

REPAIR & RESTORATION

DATASHEETS

- Cement All®
- Mortar Mix
- Mortar Mix Plus
- Concrete Mix
- V/O Repair Mix
- OnePass®
- WunderFixx®
- Water Stop
- WP Mortar HP

CEMENT ALL

Multi-Purpose Repair Material & Non-Shrink Grout

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® CEMENT ALL® is a high-performance, fast-setting, multi-purpose concrete repair material and non-shrink grout. Durable in wet environments, CEMENT ALL is a blend of Rapid Set hydraulic cement and specially graded fine aggregates. CEMENT ALL is non-metallic and no chlorides are added. Mix CEMENT ALL with water to produce a workable, high quality material that is ideal where rapid strength gain and high durability are desired. CEMENT ALL sets in 15 minutes and achieves structural strength in 1 hour.*

USES: Use CEMENT ALL for general and structural concrete repair, doweling and anchoring, industrial grouting, formed work, vertical and horizontal trowel applications. CEMENT ALL is ideal for airport, highway, industrial and marine applications.

ENVIRONMENTAL ADVANTAGES: Use CEMENT ALL to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply CEMENT ALL in thicknesses from featheredge to 4" (10 cm). For heavy loads and vehicle traffic, minimum thickness will vary. For deeper sections, use Rapid Set® Mortar Mix or Rapid Set® Concrete Mix. Not intended for extended exposure over 212°F (100°C). For overlay applications, a minimum of one test section should be prepared to evaluate the suitability of the materials and procedures.

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 CEMENT ALL to a surface that is thoroughly saturated 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. **CEMENT ALL may be mixed using 3 to 3.75 quarts (2.8 L to 3.5 L) of water per 55-lb (25 kg) bag for Department of Transportation projects and other critical applications. For general purpose and high fluidity 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 CEMENT ALL. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

PLACEMENT: CEMENT ALL 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. CEMENT ALL may be troweled, floated or broom finished. On flat work, do not install in layers. Install full-depth sections and progress horizontally. Do not install on frozen surfaces. To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. CEMENT ALL may be applied in temperatures ranging

OVERVIEW

Highlights:
Fast: Sets in 15 minutes, structural strength in 1 hour*
Durable: Formulated for long life in critical applications
Excellent Bond: Superior adhesion to concrete, stone, brick, block, stucco and more
Structural: For repair and new construction
Multi-Purpose: Use for concrete repair, grouting, anchoring, casting, underlayment and more

Conforms to:
ASTM: C1107†, C928 R3, C387
Army Corps of Engineers CRD C621
LA Research Report 24654

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 60	Maintenance of Grouting
03 01 70	Maintenance of Mass Concrete
03 53 19	Concrete Overlayment
03 54 16	Hydraulic Cement Underlayment
03 60 00	Grouting
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting
04 01 00	Maintenance of Masonry

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CEMENT ALL Multi-Purpose Repair Material & Non-Shrink Grout

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.

CURING: Water cure all CEMENT ALL installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of water curing is to maintain the moist sheen on the entire surface until the product has achieved sufficient strength. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required.

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: CEMENT ALL is available in 55-lb, and 25-lb (25 kg, and 11.3 kg) sizes. One 55-lb (25 kg) bag of CEMENT ALL will yield approximately 0.5 ft^3 (0.01 m^3). One 25-lb (11.3 kg) box of CEMENT ALL will yield approximately 0.2 ft^3 (0.006 m^3).

SHELF LIFE: CEMENT ALL 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C191 Mod.	
Initial set	15 minutes
Final set	35 minutes
Compressive Strength, ASTM C109 Mod.	
1 hour*	3000 psi (20.7 MPa)
3 hours	5000 psi (34.5 MPa)
24 hours	6000 psi (41.4 MPa)
7 days	7000 psi (48.3 MPa)
28 days	9000 psi (62.1 MPa)
Slant Shear Bond, ASTM C882 per C928	
24 hours	1500 psi (10.3 MPa)
7 days	2000 psi (13.8 MPa)
28 days	2500 psi (17.2 MPa)
Length Change, ASTM C157 per C928	
28 days in water (max)	0.04%
28 days in air (max)	-0.03%
Scaling Resistance, ASTM C672 per 928	
Max scaled material	0-1 lb/ft^2 (0-5 kg/m^2)
Flexural Strength, ASTM C78	
600 psi (4.14 MPa)	7 days
800 psi (5.51 MPa)	28 days
Splitting Tensile, ASTM C496	
7 days	700 psi (4.82 MPa)
28 days	880 psi (6.06 MPa)
Change in Height at Early Ages, ASTM C827†	
At Final Set	< 1.0%
Measuring Changes in Height of Cylindrical Specimens of Hydraulic Cement Grout, ASTM C1090†	
28 Days	0%–0.3%

*After final set
Data obtained at flow consistency 102 by ASTM C1437
All Data obtained at 70°F (21°C).
†ASTM C1107 Non-Shrink Grout compliance is achieved at 3.75 quarts of water per 55 lb.

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

CEMENT ALL PLUS

Self-Curing, Multi-Purpose Repair Material

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® CEMENT ALL® PLUS is a high-performance, rapid-hardening, multi-purpose concrete repair material with extended working time. Durable in wet environments, CEMENT ALL PLUS is a blend of Rapid Set hydraulic cement, additives designed to match the color of typical existing portland-cement concrete, and specially graded fine aggregates. Cutting-edge Self–Curing Technology (SCT) means wet curing is not required in most applications. CEMENT ALL PLUS is non-metallic and no chlorides are added. Mix CEMENT ALL PLUS with water to produce a workable, high quality material that is ideal where rapid strength gain and high durability are desired. CEMENT ALL PLUS has a working time of 20 minutes.

USES: Use CEMENT ALL PLUS for general and structural concrete repair, doweling and anchoring, formed work, vertical and horizontal trowel applications. CEMENT ALL PLUS is ideal for airport, highway, industrial and marine applications.

ENVIRONMENTAL ADVANTAGES: Use CEMENT ALL PLUS to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply CEMENT ALL PLUS in thicknesses from featheredge to 4" (10 cm). For heavy loads and vehicle traffic, minimum thickness will vary. For deeper sections, use Rapid Set® Mortar Mix or Rapid Set® Concrete Mix. Not intended for extended exposure over 212°F (100°C) . For overlay applications, a minimum of one test section should be prepared to evaluate the suitability of the materials and procedures.

SURFACE PREPARATION: 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. Apply CEMENT ALL PLUS to a surface that is thoroughly saturated with no standing water. For repairs, roughen surface and remove all unsound material. For underlayment or resurfacing small areas, surface must be prepared to a minimum profile of ICRI CSP 2. Mechanical methods of surface preparation such as shotblasting are preferred. Acid etching is not recommended.

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. U**se clean potable water. CEMENT ALL PLUS may be mixed using 3.25 to 4.25 quarts (3 L to 4 L) of water per 55-lb (25 kg) bag. 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. Add CEMENT ALL PLUS while the mixer is running. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

PLACEMENT: CEMENT ALL PLUS 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. CEMENT ALL PLUS may be troweled, floated or broom finished. On flat work, do not install in layers. Install full-depth sections and progress horizontally. Do not install on frozen surfaces. To extend working time, use Rapid Set® SET Control retarding

OVERVIEW

Highlights:

- Fast: 20 minute working time, structural strength in 3 hours
- Self-Curing Technology (SCT): No water curing needed
- Gray Color: Designed to match typical concrete
- Durable: Formulated for long life in critical applications
- Excellent Bond: Superior adhesion to concrete, stone, brick, block, stucco and more
- Multi-Purpose: Use for concrete repair, anchoring, casting, underlayment and more

Conforms to:

ASTM C928 R3, C387

MasterFormat® 2020

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 40	Maintenance of Precast Concrete
03 53 19	Concrete Overlayment
03 54 16	Hydraulic Cement Underlayment
04 01 00	Maintenance of Masonry

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CEMENT ALL PLUS Self-Curing, Multi-Purpose Repair Material

admixture or use cold mix water. CEMENT ALL PLUS 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.

CURING: CEMENT ALL PLUS does not require water curing or curing compound under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuous wet surface for minimum of 1 hour or until the product has achieved sufficient strength. Water curing may affect the final color.

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: CEMENT ALL PLUS is available in a 55-lb (25 kg) bag. One 55-lb (25 kg) bag of CEMENT ALL PLUS will yield approximately 0.48 ft^3 (0.014 m^3).

SHELF LIFE: CEMENT ALL PLUS 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 concrete, 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 concrete 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C191 Mod.	
Initial set	35 minutes
Final set	45 minutes

Compressive Strength, ASTM C109 Mod.	
3 hours	4000 psi (27.6 MPa)
24 hours	6000 psi (41.4 MPa)
7 days	7000 psi (48.3 MPa)
28 days	8000 psi (55.2 MPa)

Slant Shear Bond, ASTM C882 per C928	
24 hours	1500 psi (10.3 MPa)
28 days	2500 psi (17.2 MPa)

Flexural Strength, ASTM C348	
7 days	1000 psi (4.2 MPa)
28 days	1200 psi (5.5 MPa)

Data obtained at 3.7 quarts per 55-lbs at 70°F (21°C)

MORTAR MIX

High-Strength Structural Repair Mortar

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® MORTAR MIX is a high-performance, fast-setting, multi-purpose repair material. Durable in wet environments, MORTAR MIX is a blend of Rapid Set hydraulic cement and quality aggregates. MORTAR MIX is non-metallic and no chlorides are added. Mix MORTAR MIX with water to produce a workable, high quality mortar material that is ideal where fast strength gain, high durability and low shrinkage are desired. MORTAR MIX sets in 15 minutes and achieves structural strength in 1 hour.*

USES: Use MORTAR MIX for general and structural concrete repair, construction of pavements, stucco and plaster repair, one-coat exterior plaster, underlayments and formed work. MORTAR MIX is a versatile product that is suitable for vertical and overhead applications. In some geographical areas, Mortar Mix contains an air-entraining admixture for freeze-thaw durability.

ENVIRONMENTAL ADVANTAGES: Use MORTAR MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply MORTAR MIX from 1/2" to 6" (1.2 cm to 15.2 cm) thick. For thicker applications, use Rapid Set® Concrete Mix. Not intended for extended exposure over 212°F (100°C). For overlay applications, a minimum of one test section should be prepared to evaluate the suitability of the materials and procedures.

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 MORTAR MIX 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. **MORTAR MIX may be mixed using 3 to 3.75 quarts (2.8 L to 3.5 L) of water per 55-lb (25-kg) bag for Department of Transportation projects and 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 MORTAR MIX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

PLACEMENT: MORTAR MIX 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. MORTAR MIX may be troweled, floated or broom finished. On flat work, do not install in layers. 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. MORTAR MIX 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:

- Fast: Sets in 15 minutes, structural strength in 1 hour*
- Durable: Formulated for long life in critical applications
- Structural: For repair and new construction
- Multi-purpose: Use for concrete repairs, wall repairs, stucco repairs, one-coat exterior plaster, underlayments, floors, formed work, 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 & Underlayment
03 01 70	Maintenance of Mass Concrete
03 54 16	Hydraulic Cement Underlayment
04 01 00	Maintenance of Masonry
09 24 23	Cement Stucco

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

MORTAR MIX High-Strength Structural Repair Mortar

CURING: Water cure all MORTAR MIX installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of water curing is to maintain the moist sheen on the entire surface until the product has achieved sufficient strength. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required.

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: MORTAR MIX is available in 55-lb and 25-lb (25-kg and 11.3-kg) sizes. One 55-lb (25-kg) bag of MORTAR MIX will yield approximately 0.5 ft^3 (0.01 m^3). One 25-lb (11.3-kg) box of MORTAR MIX will yield approximately 0.2 ft^3 (0.006 m^3).

SHELF LIFE: MORTAR MIX 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 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

TYPICAL PHYSICAL DATA

Set Time, ASTM C266	
Initial set	15 minutes
Final set	35 minutes

Compressive Strength, ASTM C109 Mod.**	
1 hour*	2500 psi (17.2 MPa)
3 hours	4000 psi (27.6 MPa)
24 hours	5000 psi (34.5 MPa)
7 days	5500 psi (37.9 MPa)
28 days	6500 psi (44.8 MPa)

Slant Shear Bond Strength, ASTM C882 Mod. per C928	
24 hours	1200 psi (8.27 MPa)
28 days	2200 psi (15.2 MPa)

Splitting Tensile, ASTM C496 Mod.**	
7 days	450 psi (3.10 MPa)
28 days	550 psi (3.79 MPa)

Flexural Strength, ASTM C348 Mod**	
28 days	550 psi (3.79 MPa)

Freeze Thaw, C666	
Durability factor	95%

Length Change, ASTM C157 Mod. per C928 (max)	
28 days in air	-0.04
28 days in water	0.02

*After final set
**Data obtained at flow consistency 100 by ASTM C1437 at 70°F (21°C)

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

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_2 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:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

MORTAR MIX PLUS (MMP) High-Strength Polymer-Modified Structural Repair Mortar

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^3 (0.014 m^3).

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 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

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)
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)
Scaling Resistance, ASTM C672 per C928	
Visual rating	0
Freeze Thaw Resistance, ASTM C666	
Durability factor	95% (Procedure A)
Length Change, ASTM C157 per C928 (Air Storage)	
28 days (max)	-0.03%
Length Change, ASTM C157 per C928 (Water Storage)	
28 days (max)	+0.02%
Rapid Chloride Ion Penetration, ASTM C1202	
28 days	< 1000 coulombs

Data obtained at flow consistency 100 by ASTM C1437 at 70°F (21°C)

CONCRETE MIX

Very Rapid Hardening Concrete

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® CONCRETE MIX is a high-performance, fast-setting, multi-purpose concrete repair material. Durable in wet environments, CONCRETE MIX is a blend of Rapid Set hydraulic cement and quality aggregates. CONCRETE MIX is non-metallic and no chlorides are added. Mix CONCRETE MIX with water to produce a workable, quality concrete material that is ideal where fast strength gain, high durability and low shrinkage are desired. CONCRETE MIX sets in 15 minutes and is ready for traffic in 1 hour.*

USES: Use CONCRETE MIX for general and structural concrete repair, construction of pavements, formed work, footings, setting posts, industrial floors and machine bases. Ideal for airport and military pavement repairs. In some geographical areas, CONCRETE MIX contains an air-entraining admixture for freeze-thaw durability.

ENVIRONMENTAL ADVANTAGES: Use CONCRETE MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply CONCRETE MIX in thicknesses from 2" to 24" (5 cm to 61 cm). For thinner sections, use Rapid Set® Cement All® or Rapid Set® Mortar Mix. Not intended for extended exposure over 212°F (100°C). For overlay applications, a minimum of one test section should be prepared to evaluate the suitability of the materials and procedures.

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 CONCRETE MIX 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. **CONCRETE MIX may be mixed using 3.5 to 4.0 quarts (3.3 L to 3.8 L) of water per 60-lb (27.2-kg) bag for Department of Transportation projects and other critical applications.** For general purpose applications, a maximum of 4.5 quarts (4.3 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 CONCRETE MIX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

INSTALLATION: CONCRETE MIX 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. CONCRETE MIX may be troweled, floated or broom finished. On flatwork, do not install in layers. 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. CONCRETE MIX may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C). Under dry ambient conditions, water based

OVERVIEW

Highlights:

- Fast: Sets in 15 minutes, ready for traffic in 1 hour*
- Durable: Formulated for long life in critical applications
- Structural: For repair and new construction
- Multi-Purpose: Use for concrete repair, formed work, setting posts, footings, floors, machine bases, and more

Conforms to:

ASTM: C928 R2, C387

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 33 00	Architectural Concrete - Cast-in-Place Concrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CONCRETE MIX Very Rapid Hardening Concrete

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.

CURING: Water cure all CONCRETE MIX installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of water curing is to maintain the moist sheen on the entire surface until the product has achieved sufficient strength. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required.

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: CONCRETE MIX is available in 60-lb (27.2-kg) bags. One 60-lb (27.2-kg) bag of CONCRETE MIX will yield approximately 0.5 ft^3 (0.01 m^3).

SHELF LIFE: CONCRETE MIX 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C403	
Initial set	15 minutes
Final set	35 minutes
Compressive Strength, ASTM C39	
1 hour*	3000 psi (20.7 MPa)
3 hours	3600 psi (24.8 MPa)
24 hours	4500 psi (31.0 MPa)
7 days	5500 psi (37.9 MPa)
28 days	6000 psi (41.4 MPa)
Slant Shear Bond, ASTM C882 per C928	
24 hours	1200 psi (8.27 MPa)
28 days	2200 psi (15.2 MPa)
Splitting Tensile, ASTM C496	
7 days	600 psi (4.1 MPa)
28 days	700 psi (4.8 MPa)
Flexural Strength, ASTM C78	
7 days	500 psi (3.5 MPa)
28 days	550 psi (3.8 MPa)
Length Change, ASTM C157 per C928 (max)	
28 days in air	-0.04
28 days in water	0.02
Scaling Resistance, ASTM C672 per C928 (max)	
Visual rating	2
Freeze Thaw, ASTM C666 Procedure A	
Durability factor (Dynamic modulus)	98

*After final set
Data obtained at 4" slump by ASTM C143 at 70°F (21°C)

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

V/O REPAIR MIX

Vertical Overhead Repair Material

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® V/O REPAIR MIX is a high-performance, polymer-modified blend of Rapid Set® Cement with additives and quality aggregates. V/O REPAIR MIX has been specially formulated to match the color of typical portland cement concrete. Cutting-edge Self-Curing Technology (SCT) means wet curing is not required in most applications. V/O REPAIR MIX is non-metallic and no chlorides are added. Combine V/O REPAIR MIX with water to produce a high quality repair material that is ideal where rapid strength gain, high durability, and low shrinkage are desired. Integral corrosion inhibitor increases protection of embedded reinforcement. V/O REPAIR MIX has a working time of 25 minutes and achieves 2000 psi in 2 hours.

USES: Use V/O REPAIR MIX for general and structural concrete repair, marine applications and formed work. V/O REPAIR MIX is a versatile product that is suitable for horizontal, vertical and overhead applications. V/O REPAIR MIX contains an air-entraining admixture for freeze-thaw durability.

ENVIRONMENTAL ADVANTAGES: Use V/O REPAIR MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply V/O REPAIR MIX in thicknesses from 1/4" to 2" (0.6 cm to 5.1 cm). For vertical, small spot repairs, thicknesses up to 6" (15.2 cm) are acceptable.

SURFACE PREPARATION: Surface must be clean, sound, and free of oil, curing compound, dust, mastic and other bond-breakers. Surface must be prepared to a minimum profile of ICRI CSP 3. Mechanically abrade surface and remove all unsound material. Apply V/O REPAIR MIX 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 personnel and equipment are in place before mixing. Use clean, potable water. **V/O REPAIR MIX may be mixed using 3.5 to 4.0 quarts (3.3 L to 3.8 L) of water per 50-lb (22.7-kg) bag or pail. Use less water to achieve higher strengths. DO NOT exceed 4 quarts (3.8 L) of water per bag or pail.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add material. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 2 to 3 minutes). Do not retemper. Avoid mixers that entrap large amounts of air.

INSTALLATION: V/O REPAIR MIX may be placed using traditional methods. Place and consolidate 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. V/O REPAIR MIX may be troweled, floated, shaved or broom finished. Do not install on frozen surfaces. To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water.

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

OVERVIEW

Highlights:
Self-Curing Technology (SCT)
Integral corrosion inhibitor
Fiber reinforced
Freeze-thaw resistant
Concrete gray color
Polymer modified
Excellent bond and sag resistance
2000 psi (13.8 MPa) in 2 hours
25 minute working time

Conforms to:
ASTM C928 R2

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

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

V/O REPAIR MIX Vertical Overhead Repair Coarse Material

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.

CURING: V/O REPAIR MIX does not require water curing or curing compound under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface until the product has achieved sufficient strength.

YIELD & PACKAGING: One 50-lb (22.7-kg) bag or pail of V/O REPAIR MIX will yield approximately 0.37 ft^3.

SHELF LIFE: V/O REPAIR MIX 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Typical Set Time, ASTM C266	
Initial set	30 minutes
Final set	50 minutes

Compressive Strength, ASTM C109 Mod.	
2 hours	2000 psi (13.8 MPa)
24 hours	4000 psi (27.6 MPa)
7 days	6000 psi (41.4 MPa)
28 days	6500 psi (44.8 MPa)

Bond Strength, ASTM C882 per C928	
1 day	2000 psi (13.8 MPa)
7 days	2800 psi (19.3 MPa)

Flexural Strength, ASTM C348	
7 days	400 psi (2.8 MPa)
28 days	800 psi (5.5 MPa)

Scaling Resistance, ASTM C672 per C928	
Rating	0

Freeze Thaw Resistance, ASTM C666	
Durability factor	> 94%

Length Change, ASTM C157 per C928 (Air Storage)	
28 days (max)	-0.04%

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

Rapid Chloride Ion Penetration, ASTM C1202	
28 days	< 1000 coulombs

Data obtained at 4 quarts of water at 70°F (21°C)

ONEPASS®

Patch, Sand & Paint in 90 Minutes

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® ONEPASS® Wall Repair is a high-performance, fast-setting, multi-purpose wall repair material and joint compound. Durable in wet environments, ONEPASS does not promote mold and mildew growth. ONEPASS is formulated with premium grade hydraulic cement, high performance polymers and no sand for a smooth texture. ONEPASS has a working time of up to 20 minutes, and may be painted in 90 minutes.

USES: ONEPASS is used for general construction and repair of wallboard, cement board, magnesium oxide board, plaster, smooth stucco, masonry, and many other surfaces. ONEPASS can also be used as a texturing material. ONEPASS is weather resistant, and durable in both interior and exterior applications.

ENVIRONMENTAL ADVANTAGES: Use ONEPASS to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply ONEPASS in thicknesses from 0" to 1" (2.5 cm). Use screening to cover the hole and provide a backing for patches. Fill the hole with ONEPASS. This material should not be applied to substrates that may swell or deteriorate due to moisture exposure, or areas that may flex.

SURFACE PREPARATION: For repairs, application surface must be clean, sound and free from any materials that may inhibit bond, such as oil, paint, chalk, acid, dirt and loose debris. Remove all unsound material.

MIXING: Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **ONEPASS may be mixed using one part water to two parts ONEPASS.** To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. Place the desired quantity of mix water into the mixing container, then add the ONEPASS powder. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency. Do not retemper.

PLACEMENT: Apply ONEPASS with a trowel or putty knife. There is approximately 20 minutes working time at 70°F (21°C). Place quickly and cleanly to allow for maximum finishing time. Material may be sanded when dry (approximately 45 minutes after adding water). ONEPASS should not be applied if surface or ambient temperature is below 45°F (7.2°C).

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 and use heated mix water.

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

OVERVIEW

Highlights:

Fast: Patch, sand and paint in 90 minutes

Low-shrink: Apply up to 1-inch thick in one coat

Interior/Exterior: Water resistant, durable in wet environments

Mold Resistant: Does not promote growth of mold and mildew

Versatile: For construction and repair of dry-wall, plaster, masonry, smooth stucco, and many other surfaces. Control the set time by using hot/cold water or use Rapid Set® SET Control additive

Tested and evaluated in accordance with:

ASTM: D3273, D3274

MasterFormat® 2016

09 24 23 Cement Stucco

09 29 00 Gypsum Board

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

ONEPASS® Patch, Sand & Paint in 90 Minutes

CURING: Rapid Set® ONEPASS does not require water curing or curing compound under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface until the product has achieved sufficient strength.

YIELD & PACKAGING: ONEPASS is available in 25-lb and 9-lb (11.3-kg and 4.1-kg) sizes. One 25-lb (11.3-kg) bag of ONEPASS will yield approximately 77 ft² (7.2 m²) at 1/16" (0.2 cm) thick.

SHELF LIFE: ONEPASS 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

WUNDERFIXX®

Concrete Smoothing Compound

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® WUNDERFIXX® is a high-performance, gray concrete smoothing compound. WUNDERFIXX is a blend of Rapid Set hydraulic cement, high-performance polymers, self-curing technology (SCT) and finely ground aggregate. Mix WUNDERFIXX with water to produce a workable, easy-to-apply mixture with excellent bonding characteristics. Liquid bonding agent is not required. Trowel apply WUNDERFIXX to achieve a smooth and uniform finish. After applying, WUNDERFIXX may be sanded within 24 hours to achieve an ultra-smooth finish.

USES: Use WUNDERFIXX for cosmetic patching, detailing and smoothing on tilt-up panels, precast, formed work, concrete block and other concrete and masonry surfaces. Durable in wet environments, it is suitable for both interior and exterior applications. WUNDERFIXX may be used on vertical, overhead and non-wearing horizontal surfaces.

ENVIRONMENTAL ADVANTAGES: Use WUNDERFIXX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply WUNDERFIXX in thicknesses from skim coat to 1/2" (1.3 cm). For thicker applications, use appropriate Rapid Set® repair products. Consult your CTS Cement Representative for more information and training.

SURFACE PREPARATION: Application surface must be clean, sound concrete that is free from any materials that may inhibit bond, such as form release, oil, curing compound, acid, dirt and loose debris. Apply WUNDERFIXX to a surface that is dry or saturated with no standing water. A test area should be applied to determine suitability in the repair environment.

MIXING: The use of a drill-mounted mixing paddle is recommended. Organize work so that personnel and equipment are in place before mixing. Use clean, potable water. **WUNDERFIXX may be mixed using 6 to 8 quarts (5.7 L to 7.6 L) per 50-lb** (22.7-kg) **bag. Use less water to achieve higher strengths. Do not exceed 8 quarts (7.6 L) of water per bag.** 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 WUNDERFIXX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency. Do not retemper.

INSTALLATION: At time of installation, the surface and ambient temperatures must be between 50°F and 90°F (10°C and 32°C). WUNDERFIXX has a working time of 30 minutes at a temperature of 70°F (21°C). Once in place, as the material becomes stiff (typically within 10 to 20 minutes), use a trowel to shave or cut the excess material to the desired shape. Material can be sanded, primed and painted the same day.

CURING: WUNDERFIXX does not require water curing or curing compound under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface until the product has achieved sufficient strength.

OVERVIEW

Highlights:

- Easy To Use: Just add water, no bonding agent needed
- High Performance: Patch, sand and paint the same day
- Ultra-Smooth Finish: Grit free and sandable within 24 hours
- Excellent Bond: Bonds to concrete, brick, block, plaster and other concrete and masonry surfaces
- Self-Curing Technology (SCT): No water curing needed under normal conditions
- Interior/Exterior: Water resistant and durable in wet environments

Conforms to:

ASTM C109

MasterFormat® 2016

03 01 40	Maintenance of Precast Concrete
03 01 50	Maintenance of Cast Decks and Underlayments
09 24 23	Cement Stucco

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

WUNDERFIXX® Concrete Smoothing Compound

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: WUNDERFIXX is available in 50-lb (22.7-kg) and 9-lb (4.1-kg) sizes. One 50-lb (22.7-kg) bag of WUNDERFIXX will yield approximately 115 ft^2 (10.7 m^2) at 1/16" (1.6 mm).

SHELF LIFE: WUNDERFIXX 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. As with all cement-based products, optical variations to the finished surface should be expected.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

ASTM C109 Mod.	
Age	Compressive Strength
24 hours	1000 psi (6.9 MPa)
28 days	2000 psi (13.8 MPa)

All data produced at 70°F (21°C)

WATER STOP

Hydraulic Cement-Based Water Plug

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® WATER STOP is a high-performance, fast-setting material designed to stop water leaks in concrete and masonry. Durable in wet environments, WATER STOP is a blend of Rapid Set hydraulic cement and specially graded fine aggregates. WATER STOP is non-metallic and no chlorides are added. Mix WATER STOP with water to produce a workable, high quality material that is ideal where rapid strength gain and high durability are desired. WATER STOP sets in less than 5 minutes and achieves structural strength in 1 hour.

USES: Use WATER STOP for cracks and holes to stop water intrusion in concrete or masonry surfaces such as walls, floors, swimming pools, cisterns, water tanks, basements, fountains, and more.

ENVIRONMENTAL ADVANTAGES: Use WATER STOP to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

SURFACE PREPARATION: 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 materials. Apply WATER STOP to a surface that is thoroughly saturated.

MIXING: Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **WATER STOP may be mixed using 1 part water to 3 parts WATER STOP by volume. First, add the water into a mixing container or pail. Add WATER STOP and mix thoroughly with a trowel for 30 to 60 seconds to achieve a lump-free, putty-like mixture. Do not mix more material than can be used in 2-3 minutes.** Do not retemper.

INSTALLATION: Using a trowel or gloved hands, quickly press WATER STOP firmly into the hole or crack. Maintain steady pressure until product stiffens, then release and finish. 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. Prime and paint in accordance with the paint manufacturer's recommendations. Curing: No wet curing is required under typical conditions.

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 and use heated mix water.

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 and use chilled mix water.

OVERVIEW

Highlights:
Water Plug: Stops water leaks quickly
Fast: Sets in less than 5 minutes
Strong: Structural strength in 1 hour
Concrete gray color
Excellent Bond: Superior adhesion to concrete and masonry
Multi-Purpose: Interior/exterior, horizontal, vertical, and overhead applications

Tested in accordance with:

ASTM C109

MasterFormat® 2016	
03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayments

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

WATER STOP Hydraulic Cement-Based Water Plug

YIELD & PACKAGING: WATER STOP is available in 25-lb (11.3-kg) box. 1lb (0.45kg) of WATER STOP yields approximately 14 in^3 (229 cm^3) and will repair approximately 26" of a 3/4" x 3/4" (1 kg for 146 cm of 2 cm x 2 cm) crack.

SHELF LIFE: WATER STOP 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C191 Mod.	
Initial set	4 minutes
Final set	5 minutes

Compressive Strength, ASTM C109 Mod.	
1 hour	2500 psi (17.2 MPa)
3 hours	3500 psi (24.1 MPa)
24 hours	4000 psi (27.6 MPa)
7 days	5500 psi (37.9 MPa)
28 days	6000 psi (41.4 MPa)

Typical data produced at 70°F (21°C)

WP MORTAR HP

High-Performance Cementitious Coating for Concrete and Masonry

PRODUCT DATASHEET

Rapid Set® WP MORTAR HP is a high-performance, polymer modified, cement coating. Durable in multiple environments, WP MORTAR HP is a blend of Rapid Set hydraulic cement, high performance additives and quality aggregates. WP MORTAR HP has a working time of 30 minutes, can be exposed to hydrostatic pressure in 3-5 days, and cures to a concrete gray color.

USES: Use WP MORTAR HP on interior or exterior concrete and masonry surfaces, both above and below grade. WP MORTAR HP can be used to waterproof basements, foundations, retaining walls, tilt-up concrete, cast-in-place concrete, and precast concrete.

ENVIRONMENTAL ADVANTAGES: Use WP MORTAR HP to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply WP MORTAR HP in thicknesses from 1/16" to 1/8" (0.16 cm to 0.32 cm).

SURFACE PREPARATION: 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 smooth surfaces such as precast and cast-in-place concrete. Surface must be dampened, but not saturated with water before applying WP MORTAR HP.

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. WP MORTAR HP may be mixed using 5.0 to 7.0 quarts (4.7 to 6.6 L) of water per 50-lb (22.7-kg) bag. Vary water content to achieve desired consistency. Do not exceed 7.0 quarts (6.6 L) of water per bag. Do not add any chemicals or admixtures.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add WP MORTAR HP. Mix thoroughly to achieve a homogeneous, lump-free consistency (usually 1 to 3 minutes). Let WP MORTAR HP rest undisturbed for 2 to 3 minutes, then remix and apply.

PLACEMENT: WP MORTAR HP may be applied using a trowel, tampico masonry brush, 3/8" nap roller or similar. It is essential to thoroughly work the first coat into substrate to fill all voids and cracks, then apply with a horizontal stroke to ensure even application. Allow first coat to cure for a minimum of 3 hours, then apply second coat using a vertical stroke to finish the application. To eliminate joint telegraphing and shadowing on block and masonry walls, allow WP MORTAR HP to cure for 2 days before applying second coat. Dampening the substrate is not required prior to the second coat. WP MORTAR HP may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C). Coatings may be applied to WP Mortar HP after water curing the final coat.

WATER-BASED COATINGS: Must be applied within 24 hours.

CEMENTITIOUS PRODUCTS: Must be applied within 48 hours.

SOLVENT-BASED OR IMPERMEABLE COATINGS: Must be applied after 48 hours.

CURING: Water cure all WP MORTAR HP installations after 4 hours of placement at normal

OVERVIEW

Highlights:

- Resists water intrusion in positive and negative side applications
- Single Component: Just add water
- Polymer Modified: Increased adhesion and abrasion resistance
- Fast: Return to service in 3-5 days
- Vapor Permeable: Allows structure to breathe
- Durable: Formulated for long-life in critical applications

Tested in accordance with:

- ASTM: C1583
- DIN EN 14891

MasterFormat® 2016

03 01 00	Maintenance of Concrete
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 40 00	Cast in Place Concrete
03 40 00	Precast Concrete
03 41 00	Precast Structural Concrete
03 70 00	Mass Concrete
04 01 00	Maintenance of Masonry
07 11 16	Cementitious Damproofing
07 16 00	Cementitious and Reactive Waterproofing
04 20 00	Unit Masonry

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

WP MORTAR HP High-Performance Cementitious Coating for Concrete and Masonry

temperatures at 70°F (21°C) with a light water mist for 1 hour. A curing compound (ASTM C309) may be used as a substitute for water curing after the final coat. For warm and cold weather conditions, refer to instructions, frequently asked questions (FAQs), and technical documents online at CTScement.com.

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. When experiencing extended setting time due to cold temperature, longer curing times may be required.

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.

YIELD & PACKAGING: WP MORTAR HP is available in 50-lb (22.7-kg) bags. For each coat applied with a trowel or tampico masonry brush, one 50-lb (22.7-kg) bag will cover a 100 ft^2 (9.3 m^2) at a thickness of 1/16" (0.16 cm). When applied in two coats, one 50-lb (22.7-kg) bag will cover 50 ft^2 (4.6 m^2).

SHELF LIFE: WP MORTAR HP 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.

LIMITATIONS: WP MORTAR HP is not suitable for use with aquatic life, Exterior Insulation Finish Systems (EIFS), and steam room applications. Not designed to exceed the limits of DIN EN 14891 or for sealing moving cracks.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

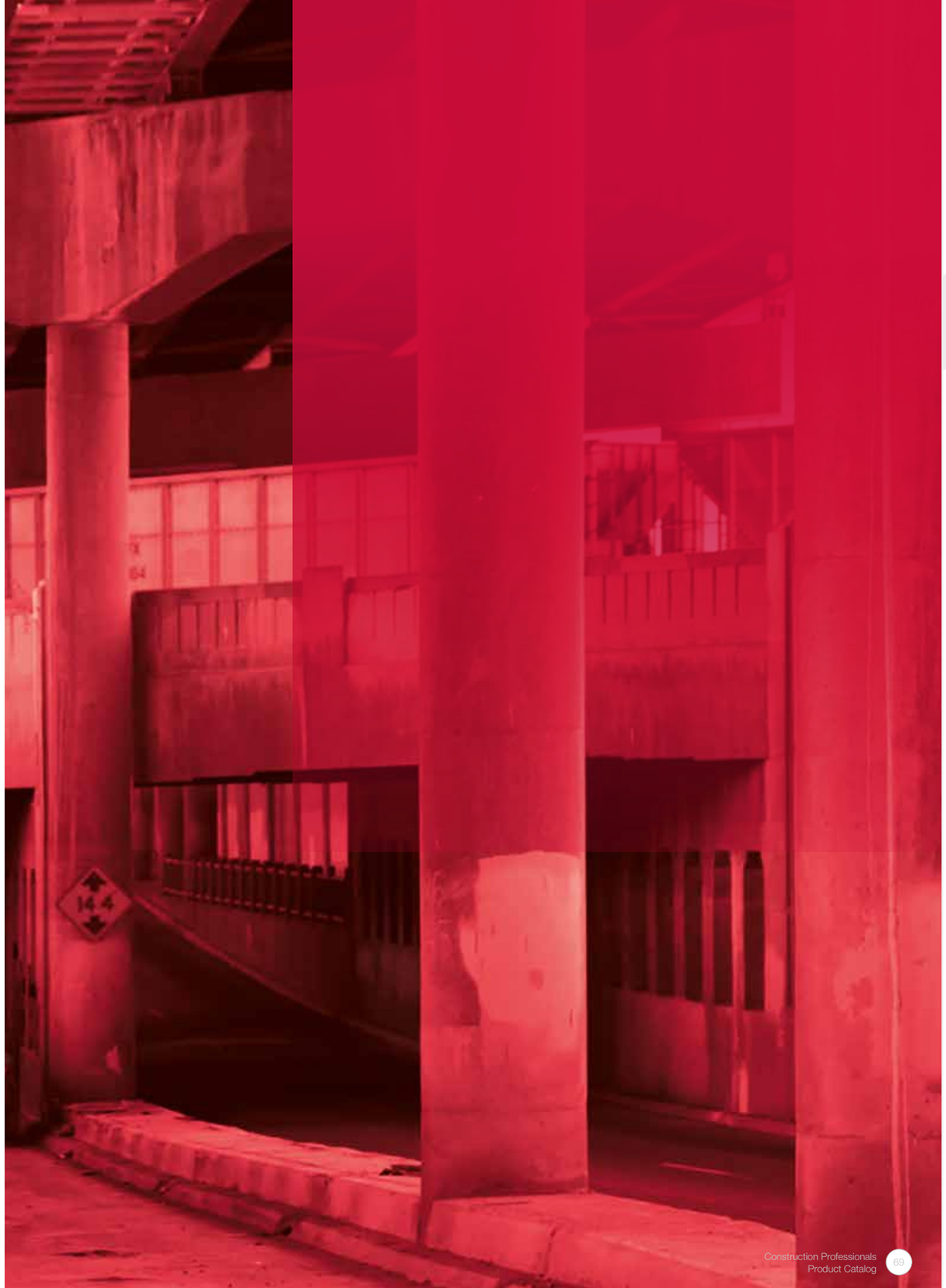
TYPICAL PHYSICAL DATA

Hydrostatic Pressure Resistance, DIN EN 14891	
Positive pressure	21.7 psi (0.15 MPa)
Negative pressure	7.3 psi (0.05 MPa)

Set Time, ASTM C191 Mod.	
Initial set	2 hours
Final set	3 hours

Compressive Strength, ASTM C109 Mod.	
24 hours	2500 psi (17.2 MPa)
3 days	3000 psi (20.7 MPa)
7 days	3500 psi (24.1 MPa)
28 days	3800 psi (26.2 MPa)

Tensile Bond Strength, ASTM C1583	
3 days	100 psi (0.69 MPa)
28 days	200 psi (1.38 MPa)



FLOORING

ARCHITECTURAL FLOORING SYSTEMS

DATASHEETS

- Acrylic Primer
- CR Concrete Resurfacer
- LevelFlor®
- Skim Coat
- TRU® Self-Leveling
- TRU® PC
- TRU® SP
- GXP General Epoxy Primer
- TXP™ Fast
- TXP™ SuperFast

POLISHED CONCRETE OVERLAYMENTS

TRU® INNOVATION
THE PROVEN SOLUTION

CTScement.com

Rapid Set®

POLISHING YOUR VISION TO MAKE IT REALITY

The Rapid Set® TRU® Flooring System is designed for beautiful, versatile, and durable results. Whether you have a commercial, industrial, residential, or other facility, TRU offers a limitless range of architectural and decorative finishes that bring your vision to life.

Architects, contractors, and owners trust us to guide them through the entire flooring process. That's because we've been working closely with leading manufacturers of grinding equipment, chemicals, and mixing equipment on architectural concrete floors since 2005.

Specifying and installing the TRU Flooring System comes with CTS Cement Manufacturing Corporation's award-winning customer support. As a service-driven company, our flooring specialists are with you every step of the way. We work with you to specify the correct products and train your team to properly install the TRU Flooring System. We strive to deliver a seamless experience.

TRUSTED BY AGENCIES AND COMPANIES WORLDWIDE

CTS has been supporting the design and construction communities, and Federal, State and public agencies since the 1960s with Rapid Set® rapid-hardening cement products and Komponent® Type K shrinkage-compensating concrete products. Our products have been used on landmarks such as the Hoover Dam Bypass, the Pentagon, the Lincoln Tunnel, the San Francisco-Oakland Bay Bridge, and major roadways, airports, commercial and industrial projects worldwide.

Loyal agencies and companies such as state DOTs, Costco, The Home Depot, Walmart, NASA, Marriott, Boeing, Honda, Starbucks, Nordstrom, Apple, Nike, CVS, Disney, and more, trust us to continue innovating and refining our products. This has led contractors, owners, engineers and architects to choose Rapid Set and Komponent to eliminate problems they have with other concrete repair materials. They save time and money, and achieve durable, structurally-sound, and aesthetically-pleasing results.

WHEN TIME, MONEY, AND DURABILITY MATTER

The TRU® Flooring System is formulated with the technology of Rapid Set® Cement, a belitic calcium sulfoaluminate (BCSA) cement that has low shrinkage, is sulfate resistant, and has a reduced risk of alkali-silica reaction. These three combined factors make Rapid Set cement concrete extremely durable, with a potential lifetime of 80 years, more than double that of portland cement concrete.

Using Rapid Set cement-based toppings, underlayments, and repair materials helps you meet aggressive timelines, reduce costs, and achieve high-quality results. With Rapid Set cement repair materials, you can repair damaged concrete instead of tearing out and replacing floors. With the TRU polished toppings, you can produce beautiful, flat, polished floors in a fraction of the time it would take with portland cement, and at a much lower cost.

CONTRIBUTING TO A HEALTHIER PLANET, ONE FLOOR AT A TIME

Rapid Set® cement uses by-products from recycling processes as raw materials which are not removed from the ground. The production of normal portland cement emits roughly 0.9 tons of CO_2 per ton of cement. Rapid Set cement emits 32% less CO_2 than portland cement because of less fuel, lower temperatures, and less limestone being used in the production process. Since Rapid Set cement concrete lasts longer than portland cement concrete, replacement and maintenance are reduced, which means less pollution is released into the environment.

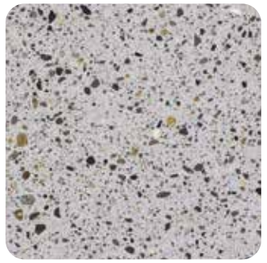
The TRU® Flooring system has been used in many facilities earning LEED Platinum, Gold, Silver, and Certified status. With millions of square feet of TRU installed, we are working to contribute to a sustainable world, one floor at a time.

POLISHED CONCRETE

is the one of the fastest growing market segments in decorative concrete today. Over the last decade, it has become one of the most viable flooring solutions for commercial and industrial flooring. If you are an architect, designer, builder or contractor, polished Rapid Set® TRU® toppings are the smart alternative for renovations or new construction projects that require a durable, fast-track, cost effective, eco-friendly, low maintenance flooring option.

TRU Self-Leveling

TRU SP



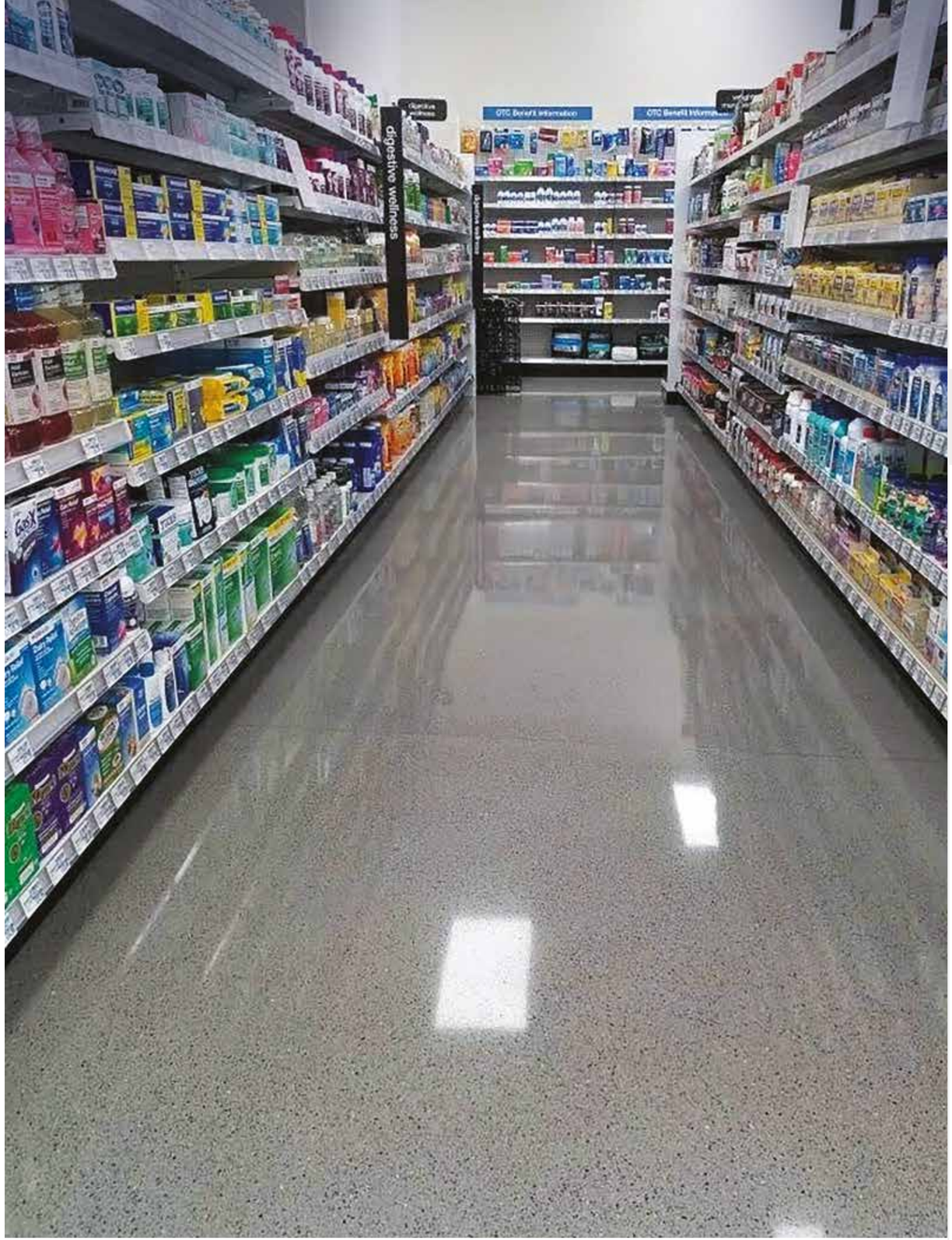
TRU PC

ADVANCED CEMENT TECHNOLOGY

CTS offers a complete line of fast-track high-strength decorative toppings, underlayments and repair materials, all formulated with our durable Rapid Set® BCSA cement technology that is built to last. TRU polished toppings are available in three different high-quality aggregate appearances, in a variety of colors and aggregate exposures that can achieve both design and performance goals.

TRU toppings are designed to be very dense and produce a high-quality polished finish that meets the slip coefficient of the polished community. Due to their high surface hardness, our polished toppings are capable of producing polished finishes with high reflectivity and excellent clarity like traditional concrete. When the level of flatness that can be gained is combined with our dense self-leveling concrete, the finished polished flooring is capable of reflecting images like a mirror, without waves or distortion. Reflections will look sharp and clear without a haze.

All TRU toppings are engineered for excellent adhesion to new (28 day old) or existing concrete substrates with long term durability. Our fast-track TRU toppings can be ground wet or dry to easily produce a uniform aggregate exposure.



ADVANTAGES

DECORATIVE
Designed specifically for polishing and decorative flooring applications

OUTSTANDING CLARITY AND GLOSS
Highly polishable due to low polymer content and high density

DESIGN OPTIONS
Customize your floors by adding aggregates and colors

FAST TRACK
Foot traffic in 2 to 3 hours, grind wet or dry, and polish in 24 hours

HIGH STRENGTH:
4,000 psi (27.6 MPa) in 24 hours, 7,000 psi (48.3 MPa) in 28 days

HIGH PERFORMANCE
Durable in dry and wet areas

POLISHED CONCRETE APPEARANCE
TRU is a high-flow topping that simulates polished concrete

ENVIRONMENTAL ADVANTAGES
Use to reduce your carbon footprint and lower your environmental impact

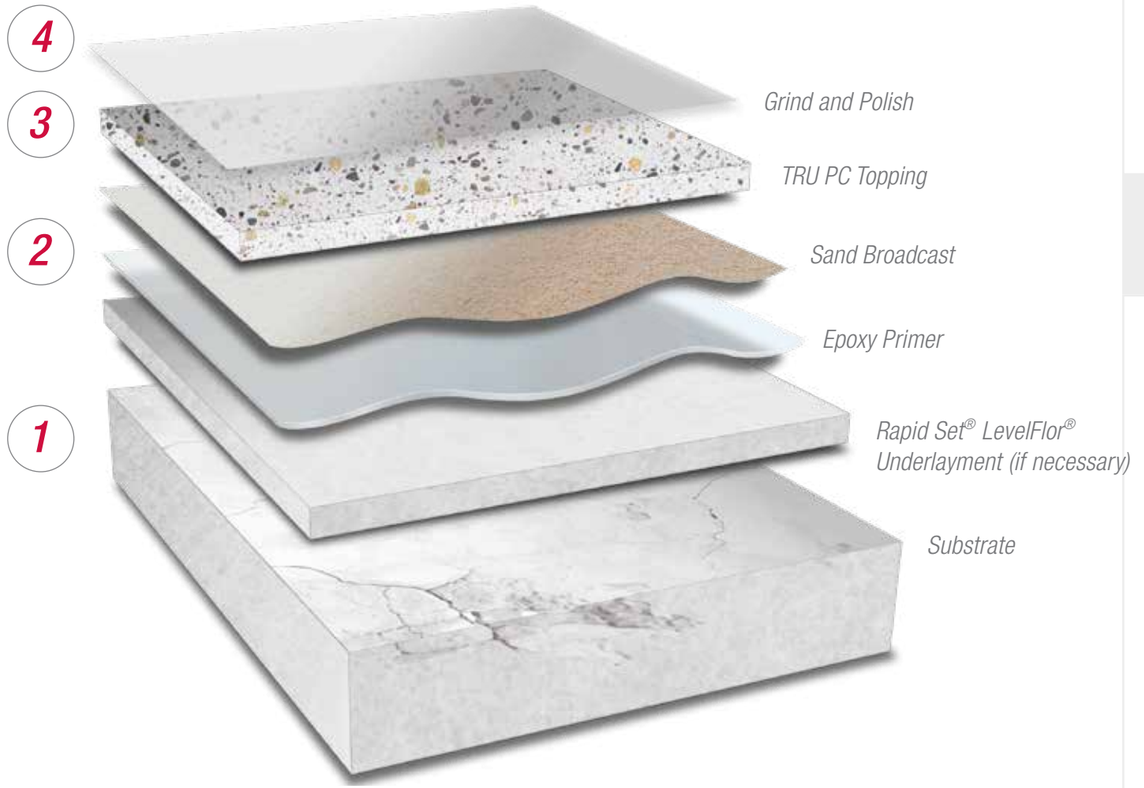
THE PROCESS
OF A TRU® SELF-LEVELING POLISHED OVERLAY

1. **PROFILE SUBSTRATE:** Mechanically prepare the surface to obtain an ICRI CSP 3 to 5
   - All joints must be honored
   - Remove all loose, unsound, contaminated material
   - Suitable substrates require a minimum 3,000 psi (20.7 MPa) and a minimum density of 100 pcf (pounds per cubic foot)
   - Fill all cracks with the appropriate crack material

2. **PRIME:** Use our alkali-resistant fast-track Rapid Set® TXP™ Epoxy Primers. Our alkali-resistant TXP Epoxy Primers offer high bond and long term performance
   - Requires 1/2 to 3/4 lbs of 20 to 30 mesh dry silica sand per square foot
   - Suitable for substrates exhibiting an RH of up to 100%
   - Cure time:
     - Rapid Set® TXP SuperFast = 2-½ to 3 hours
     - Rapid Set® TXP Fast = 4 to 6 hours

3. **MIX AND PLACEMENT:** Choose one of the Rapid Set® TRU® products
   - Minimum depth of 3/8"
   - All joints must be honored
   - Options: colorants / aggregates
   - Use appropriate mixing equipment and placement tools

4. **GRIND AND POLISH:** In 24 hours
   - Grind wet or dry



INDUSTRY LEADER

We have been in the forefront of architectural concrete floors since 2005. We have experience working on entire flooring systems with the leading manufacturers of grinding equipment, chemicals and mixing equipment. Because of our extensive experience, we have been able to revolutionize this explosive polished topping market into the commercial and industrial flooring communities.

- LARGEST NETWORK OF TRAINED CONTRACTORS
- BEST ON-SITE FIELD SUPPORT
- CONTINUING EDUCATION – AIA SEMINARS
- DESIGN AND INSTALLATION CONSULTANTS
- TRU® INSTALLED WORLDWIDE

SIXTEEN YEARS IN THE INDUSTRY

Polished concrete is a skilled profession. Over the years, we have trained and partnered with some of the best flooring contractors who install polished flooring systems for customers in all industries.

2004	Began development on self-leveling underlayment and overlayment
2005	Discovered that Rapid Set® overlayment is compatible with concrete polishing techniques and equipment
2006	Introduced Rapid Set® TRU® Self-Levleling as a polishable overlayment
2009	Developed polishing system with HTC
2010	Developed polishing system with STI
	Introduced Rapid Set® TXP™ Epoxy Primer
	Rapid Set® TRU® World of Concrete - Decorative Artistry Section
2011	Developed polishing system with SASE
	Developed polishing system with Superabrasive
	First project with portable batch mixer
2013	Developed polishing system with Husqvarna
2014	Launched Rapid Set® TRU® PC
2018	Launched Rapid Set® TRU® SP

TRU® SELF-LEVELING

Rapid Set® TRU® Self-Leveling is a high-performance, professional-grade, hydraulic cement-based, architectural topping engineered for polishing. It is durable in wet or dry conditions. TRU Self-Leveling grinds and polishes much like concrete. It can achieve high clarity and reflectivity due to its high density and excellent surface hardness.

Since TRU has more of a cream polished appearance, it has been widely used as the matrix for custom aggregate flooring. Many flooring contractors are creative with the way they use TRU to simulate terrazzo flooring by mixing marble, stone and glass chips with TRU. The chips can vary in size and color, and by adding integral coloring with the TRU, there are numerous design possibilities.

APPEARANCE

When polished, the TRU has a uniform cream polished appearance, with slight visible aggregate exposure, like a mirror, without waves or distortion. Reflections will look sharp and clear without a haze. Available in Natural or Gray base.

All TRU toppings are engineered for excellent adhesion to new (28 day old) or existing concrete substrates with long term durability. Our fast-track TRU toppings can be ground wet or dry and easily produce a uniform aggregate exposure.

Natural 1000

Gray 2000

PRODUCT HIGHLIGHTS

- High clarity and reflectivity
- Accepts high-build coatings in 16 hours
- Accepts integral color systems
- Fast-track projects by grinding wet or dry and polishing in 24 hours
- Custom TRU®azzo style flooring

PERFORMANCE

- Compressive Strength, ASTM C109 Mod.*
- 5,000 psi (34.5 MPa) in 24 hours
- 6,500 psi (44.8 MPa) in 28 days

ENVIRONMENTS

- Commercial, institutional and recreational facilities
- High-pedestrian traffic, forklift traffic or other rubber-wheeled traffic
- Schools, airports, warehouses, retail, restaurants, lobbies, and more

CSI DIVISION CLASSIFICATIONS

- Concrete Topping 03 53 00
- Cast-in-Place Concrete 03 30 00

TRU® SP

SELF-LEVELING

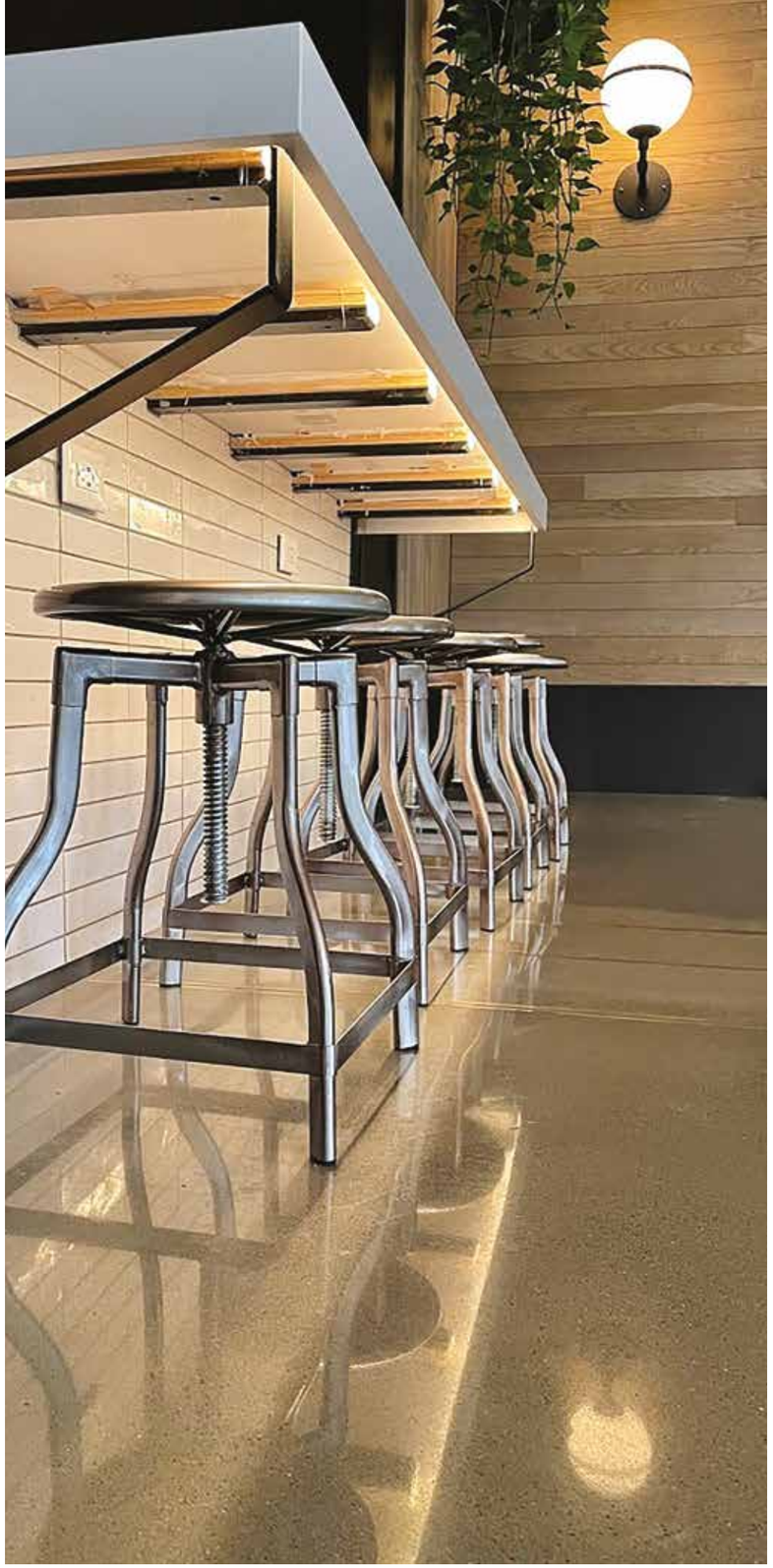
Rapid Set® TRU® SP is a high-performance, professional-grade topping with a specialized aggregate that simulates a uniform salt and pepper appearance on polished, decorative floors. It is durable in wet or dry conditions.

APPEARANCE

When polishing, the TRU SP has a uniform visible salt and pepper aggregate appearance. Available in a natural and gray base.

Natural 4000N

Gray 4000



PRODUCT HIGHLIGHTS

- High clarity and reflectivity
- Accepts high-build coatings in 16 hours
- Accepts integral color systems
- Fast-track projects by grinding wet or dry and polishing in 24 hours

PERFORMANCE

- Compressive Strength, ASTM C109 Mod.*
- 4,000 psi (27.6 MPa) in 24 hours
- 6,500 psi (44.8 MPa) in 28 days

ENVIRONMENTS

- Commercial, institutional and recreational facilities
- High-pedestrian traffic, forklift traffic or other rubber-wheeled traffic
- Schools, airports, warehouses, retail, restaurants, lobbies, and more

CSI DIVISION CLASSIFICATIONS

- Concrete Topping 03 53 00
- Cast-in-Place Concrete 03 30 00

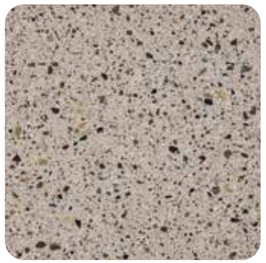
TRU® PC

SELF-LEVELING

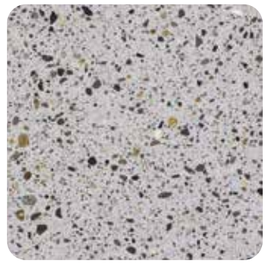
Rapid Set® TRU® PC is a high-performance topping with a specialized aggregate that simulates the appearance of polished concrete. It is durable in wet or dry conditions. TRU PC grinds and polishes much like concrete and can achieve a very high gloss and distinctness-of-image (DOI) due to its high density and excellent surface hardness.

APPEARANCE

When polishing, the TRU PC has a visible amount of aggregate exposed and has a heavy Class B exposure. Available in a natural and gray base.



Natural 3000N



Gray 3000

PRODUCT HIGHLIGHTS

- High clarity and reflectivity
- Accepts high-build coatings in 16 hours
- Accepts integral color systems
- Fast-track projects by grinding wet or dry and polishing in 24 hours

PERFORMANCE

- Compressive Strength, ASTM C109 Mod.*
- 5,000 psi (34.5 MPa) in 24 hours
- 7,000 psi (48.3 MPa) in 28 days

ENVIRONMENTS

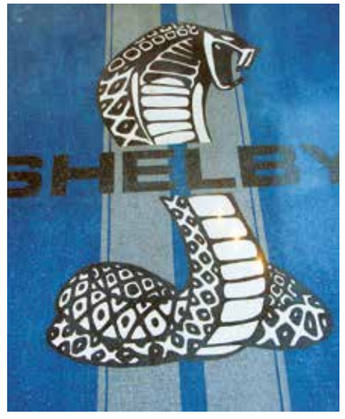
- Commercial, institutional and recreational facilities
- High-pedestrian traffic, forklift traffic or other rubber-wheeled traffic
- Schools, airports, warehouses, retail, restaurants, lobbies, and more

CSI DIVISION CLASSIFICATIONS

- Concrete Topping 03 53 00
- Cast-in-Place Concrete 03 30 00

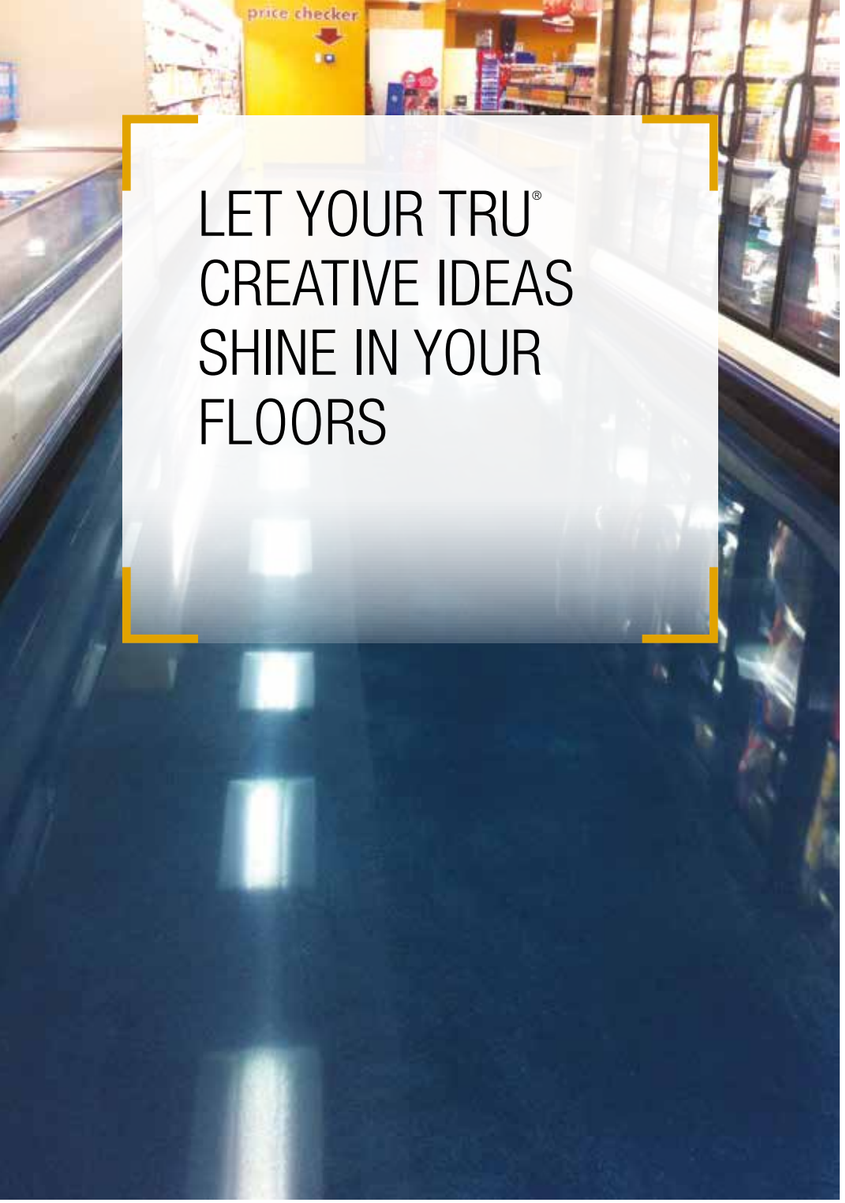
DECORATIVE

FLOORING



MORE

FINISHED FLOORING



LET YOUR TRU® CREATIVE IDEAS SHINE IN YOUR FLOORS

TRU NATURAL*
1000

TRU GRAY*
2000

TRU® INTEGRAL COLORS

Samples shown should be used as a guide only. Results will vary due to aggregate, finishing techniques and environmental factors. To match specific color, jobsite testing should be done. *Represents the color and aggregate load from the bag with no additional colorants and/or aggregates. For more customized samples, colors, specifications, questions, or jobsite support, contact **800-929-3030** or **info@ctscement.com**.

WHITE
1003

SADDLE BROWN
1064

EMERALD
1222

PLATINUM
1171

SLATE
1172

MOON ROCK
1152

CHOCOLATE
1084

VIOLET
1142

CHARCOAL
1174

BLACK
1162

SAND
1202

GOLD
1092

ROYAL BLUE
1122

BURNT SIENNA
1024

WALNUT
1234

TERRA COTTA
1054

YELLOW
1102

SCARLET
1112

OLIVE GREEN
1192

CAPPUCCINO
1254

TRU® SP COLORS

TRU SP NATURAL*
4000N

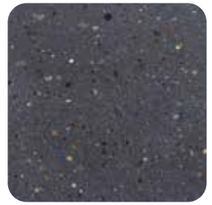
IVORY
4003N

GRAY MIST
4014N

CLOUD
4001

FRENCH GRAY
4261

GRAY ASH
4172

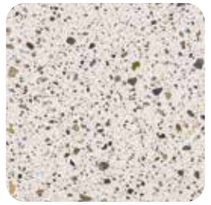


EBONY
4162

TRU SP GRAY*
4000

TRU® PC COLORS

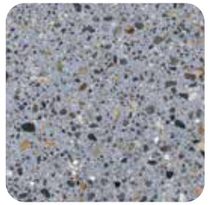
TRU PC NATURAL*
3000N



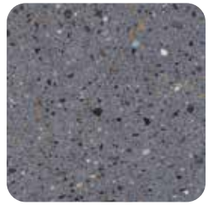
IVORY
3003N

GRAY MIST
3014N

CLOUD
3001

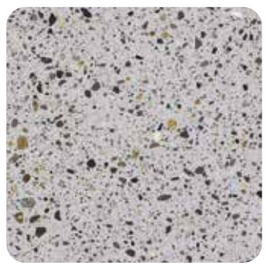


FRENCH GRAY
3261



GRAY ASH
3172

EBONY
3162



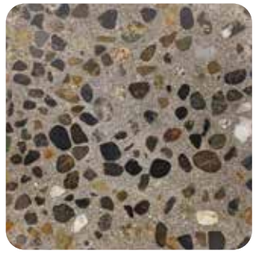
TRU PC GRAY*
3000

Samples shown should be used as a guide only. Results will vary due to aggregate, finishing techniques and environmental factors. To match specific color, jobsite testing should be done. *Represents the color and aggregate load from the bag with no additional colorants and/or aggregates. Custom colors are available. For more customized samples, colors, specifications, questions, or jobsite support, contact **800-929-3030** or **info@ctscement.com**.

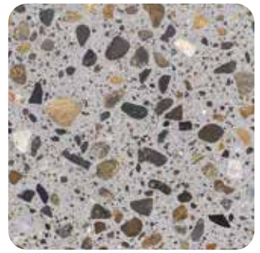
CUSTOMIZE THE LOOK OF YOUR FLOOR

Add colors and aggregates to any of our TRU® Architectural Topping products for a unique customized look.

TRU® AZZO

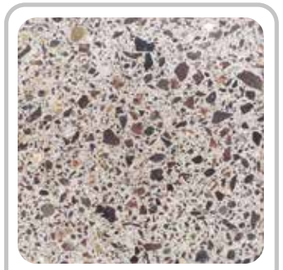


TRU SL GRAY | **1/4" TRU AGG** | *2007*



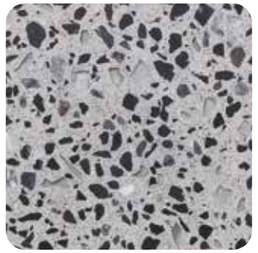
TRU PC GRAY | **1/4" TRU AGG** | *3007*

Samples shown are with Rapid Set's special 1/4" broadcast aggregate, which is only sold with TRU architectural topping products.

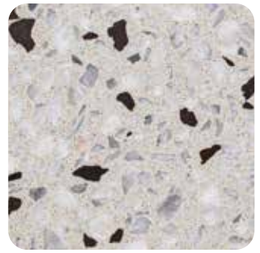


TRU PC GRAY | **TRAP ROCK** | *3400*

Heavy duty wear resistance



TRU SL GRAY | **MARBLE BLEND** | *2300*



TRU SL NATURAL | **GLASS BLEND** | *5021*

TRU SL NATURAL | **GLASS BLEND** | *5019*

TRU SL NATURAL | **MOTHER OF PEARL** | *5011*

TRU SL NATURAL | **MOTHER OF PEARL** | *5009*

Samples shown should be used as a guide only. Results will vary due to aggregate, finishing techniques and environmental factors. To match specific color, jobsite testing should be done. For more customized samples, colors, specifications, questions, or jobsite support, contact **800-929-3030** or **info@ctscement.com**.

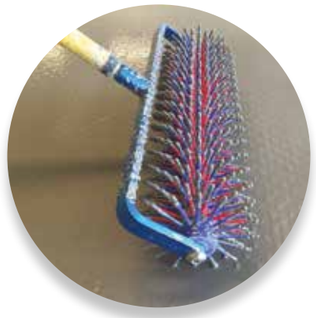
SPIKED ROLLERS

TWO SPECIALTY FINISHING ROLLERS FOR SELF-LEVELING OVERLAYS

- Releases trapped air that is produced during mixing
- Significantly reduces pinholes
- Produces a flatter floor than conventional tooling
- Threaded handle adapter
- Easy to clean

TRU® PC SPIKED ROLLER

Designed for Rapid Set® TRU® PC Polished Concrete to improve the consistency of the aggregate appearance at the surface. Also ideal for Rapid Set® LevelFlor® pre-leveling fills up to 1-¾".

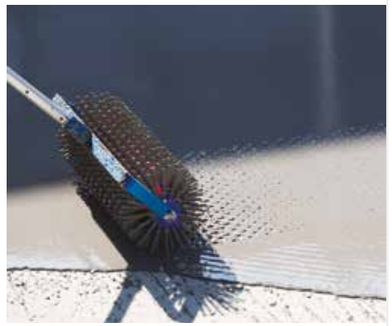


- 18" wide finishing roller
- 2" polypropylene spikes with 1/2" space between spikes
- Heavy-duty aluminum frame
- High-grade stainless steel hardware
- Acts as a leveling tool without pushing down the aggregate

TRU® SELF-LEVELING SPIKED ROLLER

Designed for use with Rapid Set TRU Self-Leveling, TRU SP, and LevelFlor. Closely spaced spikes are more effective at releasing trapped air in these fine aggregate self-leveling products without leaving a pattern in the finished surface.

- 24" wide finishing roller
- 1-¼" long, 1/64" super thin stainless steel spikes
- Easily place up to 1/2" deep pours
- Removes rake lines, assists leveling, and improves uniformity of the finished floor



REPAIR MATERIALS FOR CONCRETE FLOORS

Rapid Set® offers a full line of concrete repair products to fix cracks and surface imperfections, level or raise the elevation of existing concrete substrates, and provide a sound surface for finished flooring.

Rapid Set® Mortar Mix Plus (MMP) being used.

UNDERLAYMENTS

LEVELFLOR®

Self-Leveling Underlayment

Rapid Set® LevelFlor® is an advanced hydraulic cement-based self-leveling underlayment that can be used both indoors and outdoors. It produces a flat, strong surface with high bond strength. LevelFlor is designed for fast track leveling applications.

Use LevelFlor when a high quality, fast-setting, self-leveling underlayment is needed. LevelFlor is ideal for all floor projects that need long flow life and working time while achieving high 24-hour strength. LevelFlor is an excellent choice for new floor projects and repair projects.

Product Highlights

- High performance
  - Formulated with Rapid Set hydraulic cement
  - Provides long-life durability in wet and dry environments
- Fast setting
  - Minimizes downtime
  - Ready for foot traffic in 2 to 4 hours
  - Ready for TXP Fast or TXP SuperFast Primer in 16 hours
  - May be used as a temporary work surface prior to installation of finished flooring
  - Ceramic tile flooring may be placed in as little as 4 hours

Performance

- Tested in accordance with ASTM C1708
- 3,000 psi (20.7 MPa) in 24 hours
- 5,000 psi (34.5 MPa) in 28 days

Environments

- Commercial, institutional and recreational facilities
- High-pedestrian traffic, forklift traffic or other rubber-wheeled traffic
- Schools, airports, warehouses, retail, restaurants, lobbies, and more

SKIM FLOOR

Trowel-Grade Patching, Floor Skimming and Underlayment

Rapid Set® Skim Floor is a smooth, fast curing, sand-free, hydraulic cement-based floor underlayment. Use under flooring for patching and skim coating on interior and exterior projects.

Use Skim Floor to repair, level and smooth concrete surfaces, quarry tile, or APA rated interior-grade plywood prior to the installation of floor coverings such as VCT, sheet vinyl, carpet, tile, pavers, and other protective toppings.

Product Highlights

- Excellent bond: Bonds to concrete, plywood, brick, block and more
- Versatile: Apply featheredge to 1" (2.5 cm)
- Great workability: Easy to apply, 30 to 40 minute working time
- Initial set time: 50 minutes
- Fast setting: Walk on in 1 to 3 hours
- Interior/Exterior: Mold and mildew resistant
- Easy to use: Just add water; no primer or curing compound required

Environments

- Commercial, institutional and recreational facilities
- High-pedestrian traffic, forklift traffic or other rubber-wheeled traffic
- Schools, airports, warehouses, retail, restaurants, lobbies, and more

PRIMERS

SEAL CONCRETE AND INCREASE ADHESION

Rapid Set's high-performance acrylic and epoxy primers are easy to apply and have no VOCs. Use these primers to seal porous concrete and improve the adhesion of Rapid Set® Self-Leveling Flooring Products and TRU® polished toppings to the substrate.

FAST CURE, 100% SOLIDS, TWO-COMPONENT, ALKALI RESISTANT EPOXY PRIMER

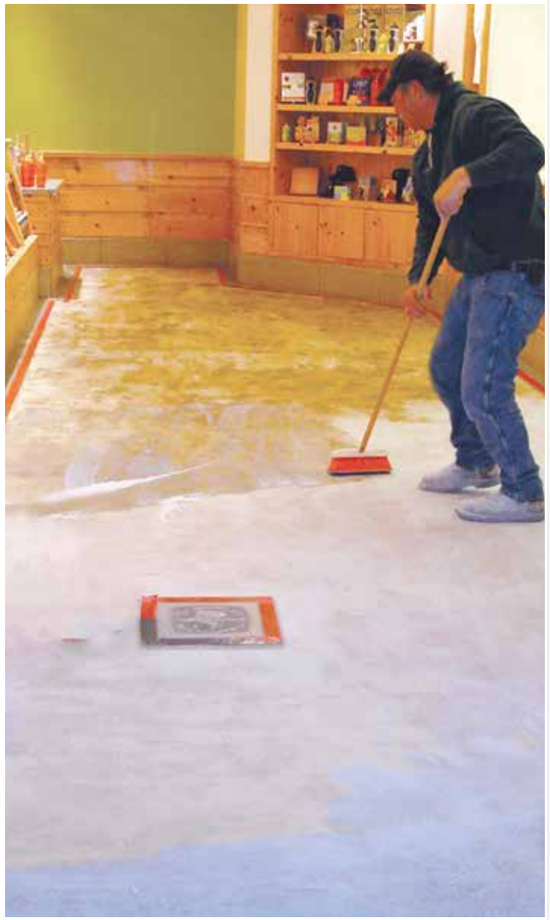
- Ready for overlayment in 4 to 6 hours
- High bond strength: Excellent adhesion to concrete
- Seals concrete, minimizes pinholes in overlayment
- Low viscosity, deep penetrating
- Low odor, no VOC
- For substrates up to 100% RH
- Color: White

SUPER FAST CURE, 100% SOLIDS, TWO-COMPONENT, ALKALI RESISTANT EPOXY PRIMER

- Ready for overlayment in as little as 2.5 hours
- High bond strength: Excellent adhesion to concrete
- Seals concrete, minimizes pinholes in overlayment
- Low viscosity, deep penetrating
- Low odor, no VOC
- For substrates up to 100% RH
- Color: Yellow

HIGH-ADHESION ACRYLIC PRIMER

- Seals porous concrete to prevent pinholes
- Improves adhesion
- Concentrated formula
- Low odor, no VOC
- Extend with water
- Accepts Rapid Set® LevelFlor® in 1 to 24 hours



TROWEL-GRADE
REPAIR MATERIALS

CONCRETE FOR PRESERVING, RESTORING, AND RECONSTRUCTING BUILDINGS AND STRUCTURES

It is essential to repair and restore concrete structures due to the deterioration of the embedded reinforcing, which results in cracking and spalling of the concrete. Rapid Set® provides a full line of cementitious products for vertical, overhead, and horizontal repairs and restoration.

HIGH-STRENGTH POLYMER-MODIFIED STRUCTURAL REPAIR MORTAR

- Apply from 1/2" to 6" thick
- Ready for TXP Fast or TXP SuperFast Primer in just 3 hours
- Polymer modified: Excellent workability, and strong adhesion
- Rapid hardening: High early strength with ample working time
- Ready for self-leveling toppings in 16 hours
- Gray color: Formulated to a concrete gray color
- Corrosion resistance: Integral corrosion inhibitor
- Freeze-thaw resistance
- Air entrained

MULTI-PURPOSE REPAIR MATERIAL & NON-SHRINK GROUT

- Apply up to 4" thick
- Ready for TXP Fast or TXP SuperFast Primer in just 3 hours
- Fast: Sets in 15 minutes, structural strength in 1 hour
- Ready for self-leveling toppings in 16 hours
- Durable: Formulated for long life in critical applications
- Excellent bond: Superior adhesion to concrete, stone, brick, block, stucco and more
- Structural: For repair and new construction
- Multi-purpose: Use for concrete repair, grouting, anchoring, casting, underlayment and more

HIGH-STRENGTH STRUCTURAL REPAIR MORTAR

- Apply from 1/2" to 6" thick
- Ready for TXP Fast or TXP SuperFast Primer in just 3 hours
- Fast: Sets in 15 minutes, structural strength in 1 hour
- Ready for self-leveling toppings in 16 hours
- Structural: For repair and new construction
- Multi-purpose: Use for concrete repairs, wall repairs, stucco repairs, one-coat exterior plaster, underlayments, floors, formed work, and more

VERY RAPID HARDENING CONCRETE

- Apply from 2" to 24" thick
- Ready for TXP Fast or TXP SuperFast Primer in just 3 hours
- Fast: Sets in 15 minutes, structural strength in 1 hour
- Ready for self-leveling toppings in 16 hours
- Durable: Formulated for long life in critical applications
- Structural: For repair and new construction
- Multi-purpose: Use for concrete repair, formed work, setting posts, footings, floors, machine bases, and more

TESTIMONIALS

How well does SASE work with the Rapid Set TRU® polished overlayment system?

SASE's equipment, diamond tooling (Xenith Pads), densifiers and protective products are perfect complements to Rapid Set TRU, TRU PC and TRU SP. SASE has developed a complete system from start to finish for the grinding and polishing of all TRU Products that work every time with absolute success. This same system has been used to consistently achieve positive results for over 10 years.

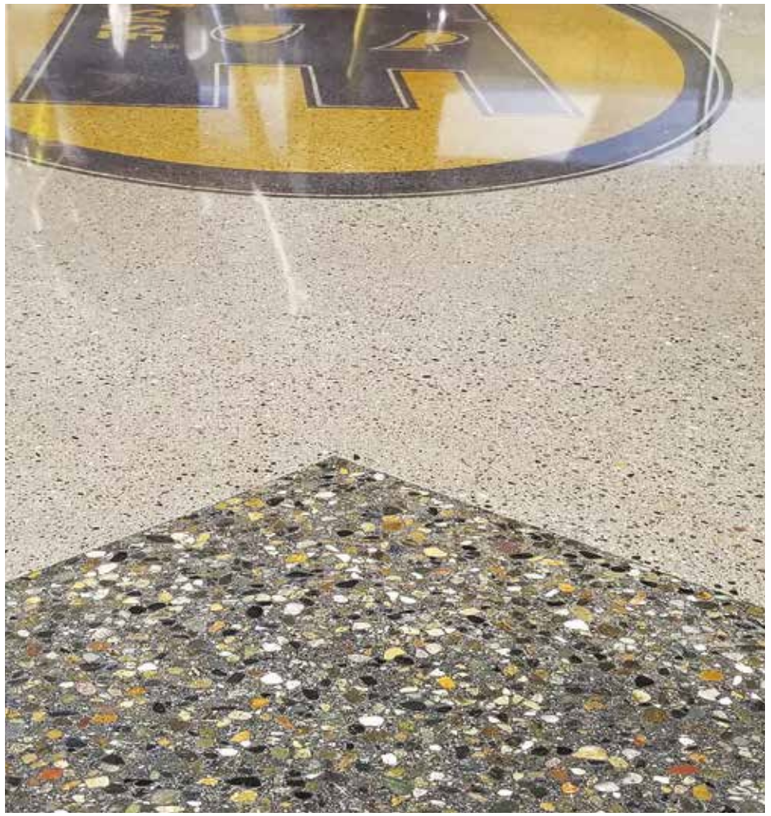
What difference do you see in polishing TRU overlayments vs. polishing traditional concrete?

Grinding and polishing Rapid Set TRU Products vs. traditional concrete can be summed up in one word, CONSISTENCY. While concrete across North America and anywhere in the world reacts very differently to diamond tooling resulting from variations in locally available aggregates and raw materials, TRU Products are consistent no matter where they are installed. This makes it easier for contractors and installers to successfully place and polish TRU Products every time.

Anything else you'd like to share?

SASE and Rapid Set share a common philosophy of knowledgeable "boots on the ground" technical staff supporting end users in the field to ensure success. We work together on jobsites to ensure positive results for our contractors and customers.

- Marcus Turek
  Vice President of Sales



AMERIPOLISH®

How well does Ameripolish work with the Rapid Set® TRU® polished overlayment system?

Ameripolish's overlayment colorant and protective chemical system was designed specifically for the Rapid Set TRU polishable overlayment system.

What difference do you see in polishing TRU overlayments vs. polishing traditional concrete?

The Rapid Set TRU Products are typically much easier to work with from a chemical standpoint due to the consistency of materials.

Anything else you'd like to share?

The Rapid Set technical support team is very knowledgeable, responsive, and service-oriented. Because of my architectural background, I can fully appreciate the value of working with Rapid Set who provides high-quality materials backed by a readily-available technical support team.

Owen P. Meyer
AIA, NCARB | VP-Professional Services

HTC Professional Floor Systems

Husqvarna

How well does HTC work with the Rapid Set® TRU® polished overlayment system?

The HTC overlay polished system in conjunction with Rapid Set is a winning combination. HTC was the first company in the industry to specifically design tooling to polish cementitious overlay material. Since the launch of Fenix pads in 2008, the development and improvement of the polishing process has continuously improved. Today HTC and Husqvarna Overlay systems create a consistent and simple process to achieve great Gloss and DOI values to the Rapid Set TRU family of products.

What difference do you see in polishing TRU overlayments vs. polishing traditional concrete?

Whenever our team is on a project that has Rapid Set overlayment installed, we know the consistency and uniform look many floor owners require will be much easier to achieve. Creating happy floor owners is a value to our team and the polished concrete industry.

Anything else you'd like to share?

Watching the development of Rapid Set TRU (PC specifically) over the years has been a game changer for our industry. The 3 largest values when using the TRU family of products over traditional concrete are: (1) teaching contractors consistent steps through the polishing process; (2) giving architects obtainable deliverables; (3) and producing a floor with consistent aggregate exposure.

Ryan McBride
Business Development National Projects

How well do Smartfloor products work with the Rapid Set® TRU® polished overlayment system?

As distributors, we are in a very fortunate position of being able to supply a broad range of products that work in perfect harmony with the Rapid Set TRU polishable overlayment system.

What difference do you see in polishing TRU overlayments vs. polishing traditional concrete?

The density and consistency of the TRU overlay material enables faster processing wet or dry. The beauty of an overlay of this type is you know what you're going to get, time after time! The very low polymer content also guarantees a great gloss and DOI level.

Anything else you'd like to share?

Having worked with CTS for a number of years now, we simply wouldn't promote any other overlay within our portfolio. We know we can rely on the product as well as have an innovative partner to work with and call upon when needed.

David Shipp
Technical Director – Smartfloor UK Ltd

SOME

CLIENTS WE'VE FLOORED

Retail

99 Cent Store
Alexander McQueen
American Eagle
American Outfitters
Amina Rubinacci
ASICS
Balenciaga
Banana Republic
Bauer Skate
Brooklyn Navy Yard
Burlington Coat Factory
Coach Mens Factory
Columbia Care Dispensary
Conn's HomePlus
CVS Pharmacy
Dollar Tree
Finish Line
Fit 2 Run
Five Below
Foot Locker
Forever 21
Hermès
Hollister
Hot Tropic
Indochino
J.C. Penney
Just Cavali
Leslie Pool
Lululemon
Lush
Mapco
MedMen Dispensary
MLB – Major League Baseball
Michaels
Nike
Nordstrom
Nordstrom Rack
Off Broadway Shoes
Old Navy
OndadeMar
O'Reilly Auto Parts
Original Penguin
Perry Ellis
Pet Pantry
PetSmart
Salt Life Clothing
Skechers
Target
TravisMathew
Tory Burch
Under Armour
Walgreens
WSS – Wholesale Shoe Store
Valli & Valli
The Void
Zadig & Voltaire

Box Store

Costco
Floor & Décor
Home Depot
Sam's Club
Walmart

Grocery Stores

Giant Grocery Store
Gordon Food Store
Green Wise
Grocery Outlet
Hi-Lo Grocery
Lidl
Smart & Final
Sprouts
Stew Leonard's
Stop & Shop
Whole Foods

Stadium/Arena

Bryant-Denny Stadium
Florida State University
Doak Campbell Stadium
State Farm Arena
University of Cincinnati
Nippert Stadium
West End Stadium

Government

American Air Force
Exchange Services
Fort Bragg Air Force Base
Fort Carson Air Force Base
Long Beach Fire House
Maxwell Air Force Base
NASA Robotic Technology Park

Medical

St. Petersburg General Hospital
Trinity Hospital

Hair Salon

Red Market Salon

Hotel

A Loft
Breakers
ECO Apartments
Hyatt – Cook County
Hyatt – Thompson Washington, D.C.
Marriott

Museums

Corning Museum of Glass
Norton Museum of Art

Offices

Amazon
Apple
Alcatel-Lucent
Boeing
CAT
Comcast
Consolidated Labels
Fanatics
Frost Bank Tower
Google
Gucci
Honda – Puerto Rico
Marc Fisher Shoes
Media Arts Office
MetLife
National Instruments
NBA – National Basketball Association
NHL – National Hockey League
Willis Tower

Restaurant

California Pizza Kitchen
Chipotle
Doc Ford's
High Five Yogurt
Krispy Kreme
Starbucks
Taverna Opa
Wahlburgers

Jewelry Store

Misaki Jewelry

Observation Deck

The Observation Deck
at CEB Tower

School/University

Fellsmere Boys School
Lane Community College
Seton High School
St. Petersburg Beach College
Texas A&M University
University of South Florida

International

Box Store

Costco – Beitou Taiwan

Church

Cathedral– Seoul Korea
Oakridge Lutheran Church

Retail

Yves Saint Laurent – Thailand

Office

Descente Innovation Complex
– South Korea

Residential

Bahia Kino – Mexico Residence

School/University

University of British Columbia
– Vancouver, Canada

Theme Park

Warner Brothers World Abu Dhabi
– United Arab Emirates

HANDS-ON TRAINING

The Rapid Set® TRU® Flooring System has been used in many facilities earning LEED Platinum, Gold, Silver, and Certified status. With millions of square feet of TRU installed, we are working on contributing to a more sustainable world, one floor at a time.

Our experts are skilled and experienced as former flooring contractors. They are on the forefront of architectural concrete floors, and know what contractors need to do to achieve the high quality, beautiful results you desire. Contractors who follow our flooring system have the highest rate of success.

TRU has the largest preferred network of polishing contractors (and growing) ready to bring your vision to reality.

We are experienced in working on entire flooring systems with other manufacturers' equipment, tools and materials. This along with continuing education on the latest equipment, chemicals and trends, has made us the experts in the concrete flooring industry.

RESOURCES

Additional resources on the most up-to-date Rapid Set® TRU® documents, projects, courses, training, and more.

Receive Continuing Education Units (CEUs)

by taking the Polished Concrete Overlayments Course at CTScement.com.

www.ctscement.com/resources/professional/cecourses

Rapid Set TRU Microsite and Installation Guide

www.ctscement.com/media/tru/

Trade Shows and Events

www.ctscement.com/resources/professional/tradeshowsevents

CTS Cement Manufacturing Corp. | 12442 Knott Street, Garden Grove, CA 92841 | CTScement.com | 1-800-929-3030

ACRYLIC PRIMER

High-Adhesion Acrylic Primer

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® ACRYLIC PRIMER is a concentrated acrylic primer that improves the adhesion of Rapid Set self-leveling flooring products to prepared concrete. ACRYLIC PRIMER acts to prevent pinholes from forming in the finished surface.

SURFACE PREPARATION: ACRYLIC PRIMER is intended for use on prepared concrete. Surface must be dry, porous, clean, sound, and free of oil, curing compounds, dust, mastic and other bond breakers. Mechanically profile the surface by shot blasting or grinding. Acid etching the concrete surface is not recommended.

MIXING & APPLICATION: Shake well to ensure there is no sediment in the container bottom and to thoroughly mix the primer. Mix with water at low speed using a drill and paint mixer in a clean container.

For normal concrete, mix at a ratio of 1 part primer to 1 part water. Excessively absorbent concrete surfaces require multiple coats with the first coat mixed at 1 part primer to 3 parts water. Additional coats must be mixed at 1 part primer to 1 part water. Allow each coat to dry and become tack free. Repeat as necessary until the final coat of primer stays wet for at least 20 minutes. Lower temperatures and/or higher humidity will extend drying time.

Apply primer to substrate and work into the concrete surface with a soft-bristle push broom. Paint roller or spray application will not achieve sufficient coverage. Spread evenly to avoid puddles and to thoroughly coat the surface. Maintain material, surface, and ambient temperatures above 50°F (10°C).

Apply Rapid Set self-leveling flooring products when the primer is thoroughly dry. If more than 24 hours have elapsed, reapply primer.

COVERAGE & PACKAGING: ACRYLIC PRIMER is available in 1-gallon bottles. Coverage is about 400 ft² to 600 ft² (37 m² to 56 m²) per gallon.

SHELF LIFE: ACRYLIC PRIMER has a shelf life of 2 years the from date of manufacture when stored properly in a dry location, protected from moisture, out of direct sunlight, and in an undamaged package. Do not allow material to freeze.

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. Acrylic Primer is not for use in wet environments or on substrates that have a Moisture Vapor Emission Rate greater than 5 lbs. per 1000 ft² (2.26 kg per 92.9 m²) in 24 hours or relative humidity greater than 79%.

OVERVIEW

Highlights:

Improves Adhesion: Seals porous concrete to prevent pinholes

Coverage: 400 ft² to 600 ft²

MasterFormat® 2016

03 05 00	Concrete Bonding Agents, Admixtures and Adhesives

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

ACRYLIC PRIMER High-Adhesion Acrylic Primer

WARNING: AVOID CONTACT WITH EYES AND SKIN. Close container after each use. Do not reuse container. Dispose of container and primer residue in accordance with federal, state and local waste disposal regulations. Do not flush primer down drains, sewers or waterways. Carefully read and follow all cautions and warnings on product label. For complete safety information, please refer to product SDS available at www.CTScement.com. If material comes in contact with eyes, flush with cool, clean water for 15 minutes with eyes open. If irritation persists, consult a physician. If material comes in contact with skin, wash thoroughly with soap and water. If irritation persists, consult a physician. Always use in a well-ventilated area. Avoid inhalation. KEEP OUT OF REACH OF CHILDREN. Acrylic Primer is non-toxic, non-explosive and non-flammable.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Properties
Concentrated formula
Extend with water
Accepts topping in 1 to 24 hours
Light blue color

Thickness
2 mils

Yield	
1 gallon	400 ft² to 600 ft²

Data obtained at flow consistency at 70°F (21°C)

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

CONCRETE RESURFACER

Resurface Worn, Old, Spalled Concrete

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® CONCRETE RESURFACER (CR) is an advanced hydraulic cement-based polymer-modified mortar that can be used both indoors and outdoors to resurface worn, old or spalled concrete, giving a new concrete look. CR has been specially formulated to match the color of typical portland cement concrete. Cutting-edge self-curing technology (SCT) means wet curing is not required in most applications. CR has a working time of up to 30 minutes and can receive foot traffic in as little as 2 to 3 hours. The drive-on time can be achieved in 4 to 8 hours.

USES: Use CR when a new wear surface is desired to repair old, damaged or discolored concrete.

ENVIRONMENTAL ADVANTAGES: Use CONCRETE RESURFACER to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Typical application thicknesses range from 1/16" to 1/4" (0.16 to 0.64 cm). In smaller areas, CR may be applied up to 1/2" (1.2 cm) thick.

SURFACE PREPARATION: Surface must be clean, sound, and free of oil, curing compound, dust, mastic and other bond breakers. Surface must be prepared to a minimum profile of ICRI CSP 2. Mechanical methods of surface preparation such as shotblasting are preferred. Acid etching is not recommended. Surface must be dry and have a minimum temperature of 50°F (10°C).

PRIMING: Priming is not required. For porous substrates, use Rapid Set® Acrylic Primer to minimize the formation of pinholes on the surface. Follow all product application instructions.

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 personnel and equipment are in place before mixing. Use clean potable water. **CR may be mixed using 3.5 to 4.5 quarts (3.3 L to 4.3 L) of water per 50-lb (22.7-kg) bag. Use less water to achieve higher strengths. Do not exceed 4.5 quarts (4.3 L) of water per bag.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add material. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 2 to 3 minutes). Do not retemper. Avoid mixers that entrap large amounts of air. Mixed CR should be used within 30 minutes at 70°F (21°C).

PLACEMENT: CR may be placed using traditional methods. Surface and ambient temperatures must be between 50°F to 90°F (10°C to 32°C). Do not install on frozen surfaces. Place quickly to allow for maximum finishing time. Once applied, typical finishing time is 5 to 10 minutes at 70°F (21°C). Thinner applications will set faster. Do not wait for bleed water; apply final finish as soon as possible. CR may be troweled, floated or broom finished with a concrete broom.

OVERVIEW

Highlights:
Rapid strength gain
Polymer modified
Self-curing technology (SCT)
Concrete gray color
Foot traffic in 2 to 3 hours, drive-on in 4 to 8 hours
30 minute working time
Interior/exterior

Tested in accordance with:
ASTM C109

MasterFormat® 2020	
03 01 30	Maintenance of Cast-In-Place Concrete
03 01 40	Maintenance of Precast Concrete
03 01 50	Maintenance of Cast Decks and Underlayments
03 01 70	Maintenance of Mass Concrete
03 53 19	Concrete Overlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CONCRETE RESURFACER Resurface Worn, Old, Spalled Concrete

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 shorten 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.

CURING: Rapid Set® CONCRETE RESURFACER (CR) does not require water curing or curing compound under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface until the product has achieved sufficient strength. CR cures to a gray color. Walk on time is approximately 2 to 3 hours.

YIELD & PACKAGING: One 50-lb (22.7 kg) bag of CR will yield approximately 0.5 ft^3 (0.014 m^3). The coverage is approximately 96 ft^2 (8.9 m^2) at 1/16" (0.16 cm) depth. Coverage may vary due to jobsite conditions.

SHELF LIFE: CR 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Compressive Strength, ASTM C109 Mod.**	
24 hours	2500 psi (17.2 MPa)
28 days	4500 psi (31.0 MPa)

**Data obtained at 4.5 quarts of water.
All data produced at 70°F (21°C).

LEVELFLOR®

Self-Leveling Underlayment

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® LEVELFLOR® is an advanced hydraulic cement-based, polymer-modified self-leveling underlayment that can be used both indoors and outdoors. LEVELFLOR rapidly levels, maintains workability for 20 minutes and produces a flat, strong surface with high bond strength. LEVELFLOR is designed for fast track leveling applications and can be covered with finished flooring in 4 to 16 hours at 70˚F (21˚C), depending on the flooring type. This advanced underlayment can be applied from featheredge to 2" (5.1 cm) thick and up to 5" (12.7 cm) thick when extended with aggregate. Contractors and engineers specify LEVELFLOR for self-leveling floor underlayment applications when a fast, durable and economical solution is required.

USES: Use LEVELFLOR when a high quality, fast-setting, self-leveling underlayment is needed. LEVELFLOR is ideal for all floor projects that need long flow life and working time while achieving high 24-hour strength. Use to level or change the elevation of your substrate prior to installing carpet, tile, hardwood, or resinous flooring. LEVELFLOR is an excellent choice for new floor projects and repair projects.

ENVIRONMENTAL ADVANTAGES: Use LEVELFLOR to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

SURFACE PREPARATION: Substrate must be clean, sound concrete that is free of gypsum compounds and all materials that may inhibit bond such as: oil, curing compound, dust, mastic, bond breakers, and other surface contaminants. Concrete vapor emission rates must comply with the finished flooring manufacturer's requirements. Smooth concrete and hard-troweled surfaces must be prepared to achieve a surface profile similar to ICRI CSP 3. Mechanical methods of surface preparation, such as shot blasting, are preferred. Acid etching is not recommended. Surface must be dry and be between 50˚F and 90˚F (10˚C and 32˚C), and be properly primed. Honor all moving joints and cracks.

PRIMING: Apply Rapid Set® Acrylic Primer to all substrate surfaces prior to placement. Follow the application instructions stated on the primer product packaging.

APPLICATION: Apply LEVELFLOR with a minimum thickness of 1/8" (3 mm) over the highest point and a maximum thickness of 2" (5.1 cm). For thicknesses greater than 2" (5.1 cm), extend each 50-lb (22.7-kg) bag with 25 lb (11.3 kg) of clean, dry 3/8" (0.95 cm) pea gravel. When extended with aggregate, LEVELFLOR may be placed up to 5" (12.7 cm) thick.

MIXING: Add one 50-lb (22.7 kg) bag of LEVELFLOR to 4.5 to 5 quarts (4.3 L to 4.7 L) of clean, potable water. Do not exceed 5 quarts (4.7 L) of water. LEVELFLOR may be mixed using a 1/2" drill mounted paddle mixer or by using an appropriate mixer and pump. Mix 3 to 5 minutes until the mixture is smooth and lump-free. Avoid mixers that entrap large amounts of air. Mixed LEVELFLOR should be placed within 20 minutes at 70˚F (21˚C). Maintain material temperature between 60˚F and 80˚F (16˚C and 27˚C).

PLACEMENT: When primer is completely dry, pour or pump LEVELFLOR. Use a gauge rake to place the material. Use a Rapid Set® Spiked Roller to remove any entrapped air

OVERVIEW

Highlights:

- Interior/Exterior: Formulated with Rapid Set® hydraulic cement. Provides long-life durability in wet and dry environments
- Fast Setting: Ready for foot traffic in 2 to 4 hours. May be used as a temporary work surface prior to installation of finished flooring
- Fast Floor Installation: Install most flooring in 4-6 hours
- High Strength: Achieves 3000 psi (20.7 MPa) compressive strength in 24 hours and 5,000 psi (34.5 MPa) in 28 days
- Easy To Use: Just add water

Tested in accordance with:

ASTM C1708

MasterFormat® 2016

03 01 50	Maintenance of Cast Decks and Underlayment
03 54 16	Hydraulic Cement Underlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

LEVELFLOR® Self-Leveling Underlayment

if necessary. A smoother trowel may be used to smooth the material. LEVELFLOR can be troweled to a featheredge to match existing elevations.

CURING: No curing is required under moderate conditions of 70˚F (21˚C). If used in exterior applications, apply a fine water mist to the newly hardened surface of LEVELFLOR as soon as it can be done without marring the surface and continue until one hour after final set. Avoid excessively dry, windy, hot or sunny conditions.

FLOOR COVERINGS: Ceramic tile may be placed in as little as 4 hours and other moisture insensitive flooring may be placed in 6 hours. Allow LEVELFLOR to cure for 16 hours prior to installing moisture sensitive flooring such as some adhesives and coatings. Always follow the flooring manufacturer's recommendations for Moisture Vapor Emission Rate and retained moisture. LEVELFLOR is not designed to function as a vapor barrier. To determine if LEVELFLOR is suitable for your specific application, install and evaluate jobsite test sections using the prepared substrate and the specified finished floor.

LEVELFLOR may be used as a temporary work surface for foot traffic in 2 to 4 hours and rubber wheel traffic in 24 hours at 70˚F (21˚C). LEVELFLOR is not designed to be a permanent finished floor surface. LEVELFLOR may be used as an underlayment in moisture control systems.

YIELD & PACKAGING: LEVELFLOR is available in 50-lb (22.7 kg) polyethylene-lined bags. Coverage is 24 ft^2 to 30 ft^2 (2.2 m^2 to 2.8 m^2) at 1/4" (0.6 cm) thickness and 12 ft^2 to 15 ft^2 (1.1 m^2 to 1.4 m^2) at 1/2" (1.3 cm) thickness for flat surfaces.

SHELF LIFE: LEVELFLOR 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Tested In Accordance with ASTM C1708*	
Working time	20 minutes
Flow life	15 minutes
Walk-on time	2 to 4 hours
Install moisture insensitive flooring	6 hours
Install moisture sensitive flooring	16 hours
VOC content	0 g/L

Set Time, ASTM C266*	
Initial set	2 hours

Compressive Strength, ASTM C109*	
24 hours	3000 psi (20.7 MPa)
7 days	3500 psi (24.1 MPa)
28 days	5000 psi (34.5 MPa)

Flexural Strength, ASTM C348*	
7 days	1150 psi (7.93 MPa)

*Data obtained at 70°F (21°C)

SKIM COAT

Patch, Skim Coat and Underlayment

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® SKIM COAT is a smooth, fast curing, sand-free, hydraulic cement-based floor underlayment. Use under flooring for patching and skim coating on interior and exterior projects. Apply from featheredge to 1" (2.5 cm).

USES: Use SKIM COAT to repair, level and smooth cement or concrete, brick or block substrates prior to the installation of floor coverings such as VCT, sheet vinyl, carpet, tile, pavers, and other protective toppings. For plywood substrates, use Rapid Set® Skim Floor.

ENVIRONMENTAL ADVANTAGES: Use SKIM COAT to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Typical application thicknesses range from featheredge to 1/4" (0.6 cm) for large areas and up to 1" (2.5 cm) for small fill areas. Most floor coverings can be installed over SKIM COAT in 1 hour. Impermeable coverings and coatings can be applied over SKIM COAT in 16 hours. Please comply with instructions from the floor covering manufacturer regarding substrate moisture and moisture testing. For sections deeper than 1" (2.5 cm), use Rapid Set® Cement All®, Mortar Mix or Concrete Mix. Conduct a minimum of one field test using the prepared substrate and finished floor covering to evaluate the suitability of the materials and procedures.

SURFACE PREPARATION: Application surfaces must be clean, sound and free from any materials that may inhibit bond, such as oil, dirt, mastic, asphalt, sealing compounds, acids, wax and loose debris. Smooth concrete surfaces must be mechanically abraded by grinding, shot blasting or other approved methods. Acid etching is not recommended.

Do not use solvents or adhesive removers as means of cleaning the substrate. Application surface must be between 50°F (10°C) and 90°F (32°C). In temperatures above 80°F (27°C), pre-wet the substrate with water before applying SKIM COAT. Honor all moving joints and cracks.

MIXING: The use of a drill-mounted mixer is recommended. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **SKIM COAT may be mixed with up to 4.0 quarts (3.8L) of water per 20-lb (9.1-kg) bag. Do not exceed 4.0 quarts (3.8 L) of water per bag.** Place water in the mixing container. While mixing, add SKIM COAT and mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper or add additional water after initial mixing. For increased fluidity and workability, use Rapid Set® FLOW Control plasticizing admixture. Contact CTS Cement for more information about the use of these additives.

PLACEMENT: Organize work so that all personnel and equipment are ready before placement. After mixing, place quickly to allow for maximum finishing time. Do not install on frozen surfaces. To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. SKIM COAT may be applied in temperatures ranging

OVERVIEW

Highlights:

- Excellent Bond: Bonds to concrete, brick, block and more
- Versatile: Apply featheredge to 1" (2.5 cm)
- Great Workability: Easy to apply, workable for up to 20 minutes
- Fast Setting: Walk on in 1 hour
- Interior/Exterior: Mold and mildew resistant
- Easy To Use: Just add water; no primer or curing compound required

MasterFormat® 2016

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayment
03 54 16	Hydraulic Cement Underlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

SKIM COAT Patch, Skim Coat and Underlayment

from 50°F (10°C) to 90°F (32°C). The working time of SKIM COAT is approximately 15 to 20 minutes at 70°F (21°C) ambient temperature.

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, or use heated mix water.

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, or use chilled mix water. The use of SET Control retarding admixture will help offset the effects of high temperatures.

CURING: SKIM COAT does not require water curing or curing compound under moderate conditions at 70°F (21°C), but it is recommended. In dry, windy or hot conditions, mist with water to maintain a continuously wet surface until the product has achieved sufficient strength.

YIELD & PACKAGING: SKIM COAT is available in 20-lb (9.1-kg) bags. One 20-lb bag will yield 600 ft^2 (55.7 m^2) as a skim coat or approximately 67 ft^2 (6.2 m^2) at 1/8" (0.3 cm) depth. Coverage may vary due to jobsite conditions.

SHELF LIFE: SKIM COAT 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

PHYSICAL PROPERTIES

Color:	Concrete gray
Working time:	15 - 20 minutes at 70°F (21°C)

Set Time, ASTM C191 Mod.	
Initial set	25 minutes
Final set	40 minutes

Compressive Strength, ASTM C109 Mod.	
3 hours	1000 psi (6.9 MPa)
24 hours	1500 psi (10.3 MPa)
7 days	2000 psi (13.8 MPa)
28 days	3000 psi (20.7 MPa)

All data produced at 70°F (21°C)

TRU® SELF-LEVELING
High-Performance Architectural Topping

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® TRU® SELF-LEVELING is an advanced, professional grade, hydraulic cement-based, architectural topping and resurfacer. It can be ground and polished to a high-gloss appearance. TRU SELF-LEVELING rapidly levels, has long flow life and maintains workability for 20 minutes, is ready for foot traffic in 2 to 3 hours, produces a smooth, strong surface, has high-bond strength, and ready for coatings in 12 hours. As an interior and exterior product, it is durable in wet or dry conditions. TRU SELF-LEVELING is available in natural and gray.

USES: Use TRU SELF-LEVELING for finished floors in commercial, institutional and recreational facilities.

ENVIRONMENTAL ADVANTAGES: Use TRU SELF-LEVELING to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply TRU SELF-LEVELING when a high quality, fast, polishable topping is required. TRU SELF-LEVELING is ideal for projects that need long flow life and working time while achieving high early strength. A customized appearance can be achieved by adding integral colors and/or decorative aggregate. Protective coatings, sealers or epoxies can be applied per the manufacturer's recommendations after 12 hours.

SURFACE PREPARATION: Substrate must be clean, sound concrete that is free of gypsum compounds and all materials that may inhibit bond such as: oil, curing compound, dust, mastic, bond breakers, and other surface contaminants. Mechanical methods of surface preparation such as shot blasting are preferred. Surface must be ICRI CSP 3 to 5. Acid etching the substrate is not recommended. Surface must be dry and be properly primed. Surface and ambient temperatures must be between 50°F and 90°F (10°C and 32°C).

PRIMING: Use a Rapid Set® TXP™ epoxy primer with sand broadcast to refusal. Follow all product specifications and instructions.

MIXING: Add one bag of TRU SELF-LEVELING to 4.0 to 4.5 quarts (3.8 to 4.3 L) of clean, potable water. Mix 3 to 5 minutes until the mixture is smooth and lump-free. Avoid mixers that entrap large amounts of air. Mixed TRU SELF-LEVELING should be used within 20 minutes at 70°F (21°C). Maintain material temperature between 60°F and 80°F (16°C and 27°C). **Do not exceed 4.5 quarts (4.3 L) per bag.**

PLACEMENT: Arrange work area to permit continuous placement without cold joints. Pour or pump the TRU SELF-LEVELING onto the prepared and primed substrate with a minimum thickness of 1/8" (3 mm) over the highest point. A minimum of 3/8" thickness (10 mm) is required for polished flooring. Please refer to CTS Technical Bulletins for more information. All existing joints and moving cracks must be honored up through the topping. TRU SELF-LEVELING will flow and level out within its 15 minute flow life. Use a gauge rake to coax the material into place as required. Use a Rapid Set® Spiked Roller to remove any entrapped air. For thicknesses greater than 1.5" (3.8 cm), extend each 50-lb (22.7-kg) bag of TRU SELF-LEVELING with 25 lbs (11.3 kg) of clean, dry 3/8" (10 mm) pea gravel.

CURING: No wet curing is required under normal conditions at 70°F (21°C). If used in exterior applications, apply a fine water mist to the newly hardened surface of TRU SELF-LEVELING as soon as it can be done without marring the surface, and continue until one hour after final set. Avoid excessively dry, windy, hot or sunny conditions.

Adhesives, thin set or paint can be applied after 6 hours. If used as a topping that will receive traffic, a high-quality sealer or coating can be applied per the manufacturer's recommendations after 12 hours.

OVERVIEW

Highlights:

- Decorative: Designed specifically for polishing and decorative flooring applications
- Outstanding Clarity & Gloss: Highly polishable with excellent surface hardness
- Versatile: Use as a topping, resurfacer or underlayment, incorporate colors and aggregates to create numerous design possibilities
- Fast Track: Foot traffic in 2 to 3 hours, grind wet or dry, and polish in 24 hours.
- High Strength: 5000 psi (34.5 MPa) in 24 hours, 6500 psi (44.8 MPa) in 28 days
- Interior/Exterior: Durable in dry and wet areas

Tested in accordance with:

ASTM C1708

MasterFormat® 2016

03 01 50	Maintenance of Cast Decks and Underlayment
03 53 19	Concrete Overlayment
03 54 16	Hydraulic Cement Underlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

TRU® SELF-LEVELING High-Performance Architectural Topping

POLISHING: TRU SELF-LEVELING may be polished wet or dry after 24 hours at normal conditions. TRU SELF-LEVELING grinds and polishes much like concrete and can achieve a very high gloss and Distinctness-of-Image (DOI) due to its excellent surface hardness. Polishing any topping requires a high degree of experience and craftsmanship. Contact CTS Cement for a list of preferred installers.

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.

YIELD & PACKAGING: TRU SELF-LEVELING is available in 50-lb (22.7-kg) polyethylene-lined bags. Yield is 0.45 ft^3 per 50-lb (22.7-kg) bag. Coverage is 15 ft^2 to 16 ft^2 (1.4 m^2 to 1.5 m^2) at 3/8" (10 mm) thickness and 11 ft^2 to 12 ft^2 (1.02 m^2 to 1.11 m^2) at 1/2" (13 mm) thickness for flat surfaces.

SHELF LIFE: TRU SELF-LEVELING 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: TRU SELF-LEVELING is a rigid, non-structural topping. It is not possible to predict the appearance of micro-cracking in a non-structural topping and such overlayments may not be capable of restraining movement from the substrate. Reflective cracks may appear due to vibration, substrate flexure or existing joints and cracks. TRU SELF-LEVELING is designed as a wear surface for foot traffic, forklift traffic or other rubber-wheeled traffic. The result of highly localized imposed loads, such as steel or hard-plastic wheeled traffic, heavy metal equipment, or pallets with protruding nails, may cause abrasion or gouging to the flooring surfaces. Due to its cementitious nature, TRU SELF-LEVELING cannot be completely homogenous in appearance and optical variations to the finished floor should be expected. TRU SELF-LEVELING is not recommended in locations subject to freezing temperatures or where deicing salts will be used.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Working time	20 minutes
Flow life	15 minutes

Compressive Strength, ASTM C109 Mod.*	
4 hours	3000 psi (20.7 MPa)
24 hours	5000 psi (34.5 MPa)
28 days	6500 psi (44.8 MPa)

Slant Shear Bond Strength, ASTM C882 Mod.*	
7 days	2100 psi (14.5 MPa)
28 days	2900 psi (20.0 MPa)

Tensile Strength, ASTM C307*	
7 days	210 psi (1.44 MPa)
28 days	365 psi (2.51 MPa)

Flexural Strength, ASTM C348*	
24 hours	850 psi (5.86 MPa)
28 days	1900 psi (13.1 MPa)

*Data obtained at 4.25 quarts of water per 50 lbs. at 70°F (21°C)

TRU® PC

Polished Concrete Finish, High-Performance, Self-Leveling, Architectural Topping

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® TRU® PC is an advanced, professional grade, hydraulic cement-based, self-leveling, architectural topping and resurfacer. It can be ground and polished to expose the aggregate and simulate the appearance of polished concrete. TRU PC rapidly levels, maintains workability for up to 20 minutes, is ready for foot traffic in 2 to 3 hours, produces a dense surface, has high-bond strength, and is ready for coatings in 12 hours. As an interior and exterior product, it is durable in wet or dry conditions. TRU PC is available in natural and gray.

USES: Use TRU PC for polished concrete floors in schools, airports, warehouses, retail, restaurants, lobbies, and more.

ENVIRONMENTAL ADVANTAGES: Use TRU PC to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Use TRU PC when a high quality, fast, polishable concrete topping is required. TRU PC is ideal for projects that need long flow life and working time while achieving high early strength. Protective coatings, sealers or epoxies can be applied per the manufacturer's recommendations after 12 hours.

SURFACE PREPARATION: Substrate must be clean, sound concrete that is free of gypsum compounds and all materials that may inhibit bond such as: oil, curing compound, dust, mastic, bond breakers, and other surface contaminants. Mechanical methods of surface preparation such as shot blasting are preferred. Surface must be ICRI CSP 3 to 5. Acid etching the substrate is not recommended. Surface must be dry and be properly primed. Surface and ambient temperatures must be between 50°F and 90°F (10°C and 32°C).

PRIMING: Use a Rapid Set® TXP™ Epoxy Primer with sand broadcast to refusal. Follow all product specifications and instructions.

MIXING: For each bag of TRU PC, use 3.75 to 4.0 quarts (3.5 L to 3.8 L) of potable water. For polished floors, use less water to achieve maximum aggregate exposure with minimal grinding. Start with 3.75 quarts (3.5 L) per bag. Add the measured amount of water to the mixing container. While the mixer is running, add TRU PC. Additional water may be added if necessary. **Do not exceed 4.25 quarts (4.0 L) per bag.**

Multi-bag batches produce more uniform results. For 4-bag batches, use 15.0 quarts (14.2 L) of water in the appropriate sized batch mixer. Mix using a helix style mixing paddle. After the final bag is added to the batch, mix an additional 2 to 3 minutes until the mixture is lump-free. If additional flow is required, add 0.5 quart (0.5 L) increments of water and check the flow. Do not exceed 21.25 quarts (20.1 L) per 5 bags. Avoid mixers that entrap large amounts of air. Mixed TRU PC should be placed within 20 minutes. Maintain material temperature between 60°F (16°C) and 80°F (27°C).

PLACEMENT: Arrange work area to permit continuous placement without cold joints. Place the TRU PC onto the prepared and primed substrate with a minimum thickness of 3/8" (10 mm) and maximum thickness of 1.5" (38 mm). For floors subjected to high-load, rubber-wheeled traffic, TRU PC must be applied at a minimum thickness of 1/2" (13 mm). All existing joints and moving cracks must be honored up through the topping. TRU PC will flow and level out within its 15 minute flow life. Use a gauge rake to coax the material into place as required. Immediately after placement, use a Rapid Set® TRU PC Spiked Roller to remove any entrapped air. A smoother may be used on the surface.

OVERVIEW

Highlights:

- Polished Concrete Appearance: A high-flow topping that simulates polished concrete
- Outstanding Clarity & Gloss: Highly polishable with excellent surface hardness
- Fast Track: Foot traffic in 2 to 3 hours, grind wet or dry, and polish in 24 hours
- High Strength: 5000 psi (34.5 Mpa) in 24 hours, 7000 psi (48.3 Mpa) in 28 days
- Interior/Exterior: Durable in dry and wet areas

Tested in accordance with:

ASTM C1708

MasterFormat® 2016

03 01 50	Maintenance of Cast Decks and Underlayment
03 53 19	Concrete Overlayment
03 54 16	Hydraulic Cement Underlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

TRU® PC Polished Concrete Finish, High-Performance, Self-Leveling, Architectural Topping

CURING: No wet curing is required under normal conditions at 70°F (21°C). If used in exterior applications, apply a fine water mist to the newly hardened surface of Rapid Set® TRU® PC as soon as it can be done without marring the surface, and continue until one hour after final set. Avoid excessively dry, windy, hot or sunny conditions.

POLISHING: TRU PC may be polished wet or dry after 24 hours at normal conditions. TRU PC grinds and polishes much like concrete and can achieve a very high gloss and Distinctness-of-Image (DOI) due to its excellent surface hardness. Polishing any topping requires a high degree of experience and craftsmanship. Contact CTS Cement for a list of preferred installers.

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.

YIELD & PACKAGING: TRU PC is available in 60-lb (27.2-kg) polyethylene-lined bags. Yield is 0.5 ft^3 (0.01 m^3) per 60-lb (27.2-kg) bag. Coverage is approximately 16 ft^2 (1.5 m^2) at 3/8" (10 mm) thickness or 12 ft^2 (1.1 m^2) at 1/2" (13 mm) thickness for flat surfaces.

SHELF LIFE: TRU PC 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: TRU PC is a rigid, non-structural topping. It is not possible to predict the appearance of micro-cracking in a non-structural topping and such overlayments may not be capable of restraining movement from the substrate. Reflective cracks may appear due to vibration, substrate flexure or existing joints and cracks. TRU PC is designed as a wear surface for foot traffic, forklift traffic or other rubber-wheeled traffic. The result of highly localized imposed loads, such as steel or hard-plastic wheeled traffic, heavy metal equipment, or pallets with protruding nails, may cause abrasion or gouging to the flooring surfaces. TRU PC is designed to have a non-uniform appearance and optical variations to the finished floor should be expected. TRU PC is not recommended in locations subject to freezing temperatures or where deicing salts will be used.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Working time	20 minutes
Flow life	15 minutes

Compressive Strength, ASTM C109*	
4 hours	2800 psi (19.3 MPa)
24 hours	5000 psi (34.5 MPa)
28 days	7000 psi (48.3 MPa)

*Data obtained at 4.0 quarts of water per 60 lbs. at 70°F (21°C)

TRU® SP SELF-LEVELING

Salt & Pepper Finish, High-Performance, Self-Leveling, Architectural Topping

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® TRU® SP is an advanced, professional grade, hydraulic cement-based, self-leveling topping. It can be ground and polished to expose the sand and provide a salt and pepper appearance. TRU SP levels rapidly, maintains workability for up to 20 minutes, is ready for foot traffic in 2 to 3 hours, produces a dense surface, and has high bond strength. As an interior and exterior product, it is durable in wet or dry conditions. TRU SP is available in natural and gray.

USES: Use TRU SP for polished floors in schools, airports, warehouses, retail, restaurants, lobbies, and more.

ENVIRONMENTAL ADVANTAGES: Use TRU SP to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Use TRU SP when a high quality, fast, polishable topping is required. TRU SP is ideal for projects that need long flow life and working time while achieving high early strength. Protective coatings, sealers or epoxies can be applied per the manufacturer's recommendations after 12 hours.

SURFACE PREPARATION: Substrate must be clean, sound concrete that is free of gypsum compounds and all materials that may inhibit bond such as: oil, curing compound, dust, mastic, bond breakers, and other surface contaminants. Mechanical methods of surface preparation such as shot blasting are preferred. Surface must be ICRI CSP 3 to 5. Acid etching the substrate is not recommended. Surface must be dry and be properly primed. Surface and ambient temperatures must be between 50°F and 90°F (10°C and 32°C).

PRIMING: Use a Rapid Set® TXP™ Epoxy Primer with sand broadcast to refusal. Follow all product specifications and instructions.

MIXING: For each bag of TRU SP, use 4.0 to 4.5 quarts (3.8 L to 4.3 L) of potable water. For polished floors, use less water to achieve maximum sand exposure with minimal grinding. It is recommended to start with 4.25 quarts (4.0 L) per bag. Add the measured amount of water to the mixing container. While the mixer is running, add TRU SP. Water may be adjusted within the acceptable range, if necessary, to provide the desired flow. **Do not exceed 4.5 quarts (4.3 L) per bag.**

When mixing 4-bag batches, use 17.0 quarts (16.1 L) of water in the appropriate sized batch mixer. Mix using an ICRI 320.5R #P2 or #P9 helix-style mixing paddle. After the final bag is added to the batch, mix an additional 2 to 3 minutes until the mixture is lump-free. If more flow is required, add 0.5 quart (0.5 L) increments of water and check the flow. Do not exceed 18 quarts (17.0 L) per 4 bags. Avoid mixers that entrap large amounts of air. Mixed TRU SP should be placed within 20 minutes. Maintain material temperature between 60°F and 80°F (16°C and 27°C).

PLACEMENT: Arrange work area to permit continuous placement without cold joints. Place the TRU SP onto the prepared and primed substrate with a minimum thickness of 3/8" (10 mm) and maximum thickness of 1.5" (38 mm). For floors subjected to high-load traffic, TRU SP must be applied at a minimum thickness of 1/2" (13 mm). All existing joints and moving cracks must be honored up through the topping. TRU SP will flow and level within 15 minutes. Use a gauge rake to coax the material into place as required. Immediately after placement, use a Rapid Set® Spiked Roller to remove any entrapped air. A smoother may be used on the surface.

CURING: No wet curing is required under normal conditions at 70°F (21°C) with moderate humidity. If used in exterior or low humidity conditions, apply a fine water mist as soon as it can be done without marring the surface. Continue until one hour after final set. Avoid excessively dry, windy, hot or sunny conditions.

POLISHING: TRU SP may be polished wet or dry after 24 hours at normal conditions. TRU SP grinds and polishes much like concrete and can achieve a very high gloss and Distinctness-of-Image (DOI) due to its excellent surface hardness. Polishing toppings requires a high degree of experience and craftsmanship. Contact CTS Cement for a list of preferred installers.

OVERVIEW

Highlights:

- Decorative: Specialized aggregate to achieve a salt and pepper appearance on polished, decorative floors
- Outstanding Clarity & Gloss: Highly polishable with excellent surface hardness
- Versatile: May be polished wet or dry. Incorporate aggregates to create numerous design possibilities
- Fast Track: Foot traffic in 2 to 3 hours, grind wet or dry, and polish in 24 hours
- Interior/Exterior: Durable in dry and wet areas

Tested in accordance with:

ASTM C1708

MasterFormat® 2016

03 01 50	Maintenance of Cast Decks and Underlayment
03 53 19	Concrete Overlayment
03 54 16	Hydraulic Cement Underlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

TRU® SP Salt & Pepper Finish, High-Performance, Self-Leveling, Architectural Topping

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.

YIELD & PACKAGING: TRU SP is available in 60-lb (27.2-kg) polyethylene-lined bags. Yield is 0.5 ft^3 (0.01 m^3) per 60-lb (27.2-kg) bag. Coverage is approximately 16-18 ft^2 (1.5-1.7 m^2) at 3/8" (10 mm) thickness or 12-14 ft^2 (1.1-1.3 m^2) at 1/2" (13 mm) thickness for flat surfaces.

SHELF LIFE: TRU SP 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: TRU SP is a rigid, non-structural topping. It is not possible to predict the appearance of micro-cracking in a non-structural topping. Such overlayments may not be capable of restraining movement from the substrate; reflective cracks may appear due to vibration, substrate flexure or existing joints and cracks. TRU SP is designed as a wear surface for foot traffic, forklift traffic or other rubber-wheeled traffic. The result of highly localized imposed loads, such as steel or hard-plastic wheeled traffic, heavy metal equipment, or pallets with protruding nails, may cause abrasion or gouging to the flooring surfaces. Due to its cementitious nature, TRU SP cannot be completely homogenous in appearance and optical variations to the finished floor should be expected. TRU SP is not recommended in locations subject to freezing temperatures or where deicing salts will be used.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Working time	20 minutes
Flow life	15 minutes

Compressive Strength, ASTM C109 Mod.*	
4 hours	2000 psi (13.8 MPa)
24 hours	4000 psi (27.6 MPa)
28 days	6500 psi (44.8 MPa)

*Data obtained at 4.25 quarts of water per 60 lbs. at 70°F (21°C)

TXP™ FAST

Fast Cure, 100% Solids, Two-Component, Alkali Resistant Epoxy Primer

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® TXP™ FAST is a two-component, 100% solids, high performance, fast-setting, epoxy primer. It is designed for use with Rapid Set® TRU® flooring products. TXP FAST has been specially formulated to have excellent substrate wetting capabilities to promote penetration and adhesion. It allows broadcast sand to be well suspended for excellent overlayment adhesion. Overlayment can be placed in 4-6 hours. TXP FAST is moisture tolerant and resistant to elevated pH levels. It is not designed to be a moisture vapor barrier.

SURFACE PREPARATION: TXP FAST is used on properly prepared concrete. Surface must be dry, porous, clean, sound, and free of grease, oil, curing compounds, dust, mastic and other contaminants or bond breakers. Mechanically profile the surface to achieve ICRI Concrete Surface Profile (CSP) 3-5. Shot blasting is the best method to prepare the substrate. Acid etching the concrete surface is not permitted. Upon completion of mechanical preparation, remove all shot, dust, dirt and debris. Determine the substrate Moisture Vapor Emission Rate (MVER) per ASTM F1869 prior to placing TXP FAST. Acceptable substrates have an MVER less than or equal to 10 lbs/1,000 sq. ft. per 24 hours and relative humidity less than or equal to 100%.

MIXING: Organize work so that all personnel and equipment are in place before mixing. Mix Part A for 2 minutes with a drill and Jiffy-type paint mixer. **Add the entire contents of Part B to the entire contents of Part A and mix for an additional 2 minutes. Proper proportioning and homogenization are absolutely critical for success; do not attempt to mix partial kits. Use the drill and Jiffy-type mixer to mix at slow speed (less than 500 rpm) to avoid air entrainment. Do not hand mix.** Ensure that the material from the sides and bottom of the pail has been thoroughly mixed in.

PLACEMENT: Upon completion of mixing, immediately pour the entire mixed TXP FAST kit onto the surface. Mixed material left in the bucket will rapidly generate heat and become unusable. Spread the TXP FAST with a squeegee to the appropriate coverage rate: 133 ft^2 (12 m^2) per gallon at 12 mils (0.30 mm) thickness or 160 ft^2 (15 m^2) per gallon at 10 mils (0.25 mm) thickness. To achieve a uniform thickness, back roll perpendicular to the squeegee application with a 1/2" (12.7 mm) nap roller. Use a paint brush for hard to reach areas. Immediately broadcast with clean, dry silica sand (#20-#30 mesh) to rejection [approximately 50 lbs to 75 lbs per 100 ft^2 (2.4 kg to 3.7 kg per m^2)]. Sweep and vacuum to remove all loose sand after a minimum curing period of 4 hours. Areas that are bare or not seeded to rejection must be recoated. Within 24 hours, those areas may be reprimed and rebroadcast. After 24 hours, the floor must be mechanically abraded, primed, broadcast and cured prior to proceeding.

Surface and ambient temperatures must be between 40°F and 100°F (4°C and 38°C). At 70°F (21°C), Rapid Set TXP FAST has a working time of approximately 30-35 minutes. Higher temperatures will shorten the working time. Lower temperatures will extend the working time and may delay the time in which excess sand may be removed.

JOINTS & REPAIRS: Non-moving cracks may be filled with the TXP FAST epoxy. For spalls, prime the surface with TXP FAST, then fill with epoxy mortar made using a mixture of 1 part TXP FAST and up to 5 parts dry, graded sand by volume. Once the repair area has

OVERVIEW

Highlights:

- Superior broadcast sand suspension properties
- Ready for overlayment in 4-6 hours
- Low viscosity, deep penetrating
- 100% solids, low odor, no VOC
- High bond strength: Excellent adhesion to concrete
- Seals concrete, minimizes pinholes in overlayment

Tested in accordance with:

ASTM: D2196, D2240, D695, D790

MasterFormat® 2016

03 05 00	Concrete bonding agents, admixtures and adhesives

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

TXP™ SUPERFAST

Super Fast Cure, 100% Solids, Two Component, Alkali Resistant Epoxy Primer

been filled, continue with the application coat of the TXP FAST and subsequent system installation in accordance with product requirements. All moving joints must be honored through the finished floor and filled with an appropriate joint sealant or filler. TXP FAST should not be used in expansion joints, isolation joints, construction joints or any moving cracks.

CLEAN-UP: Use acetone to remove TXP FAST from tools and surrounding areas before it hardens.

COVERAGE & PACKAGING: TXP FAST is available in 0.8-gallon (3.0 L) and 3-gallon (11.4 L) kits. Coverage is 160 ft² (15 m²) per gallon at 10 mils (0.25 mm) thickness. Coverage rate is approximate and will vary due to the porosity and surface profile of the concrete substrate.

SHELF LIFE: TXP FAST has a shelf life of 18 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. Contact CTS prior to product installation when additional information is required, or when project conditions are not in compliance with specifications and/or installation requirements.

Always comply with subsequent manufacturer's testing and installation requirements when their products are used in conjunction with Rapid Set® TRU® flooring products.

WARNING: AVOID BREATHING OF VAPORS. FORCED LOCAL EXHAUST IS RECOMMENDED TO EFFECTIVELY MINIMIZE EXPOSURE. NIOSH approved, organic vapor respirators and forced exhaust must be used in confined areas, when conditions (such as heated polymer, sanding) may cause high vapor concentrations, or when applying large volumes. Do not weld on, burn or torch any epoxy material. Hazardous vapor is released when an epoxy is burned. Avoid skin or eye contact. Wash skin with soap and water if contact occurs. If eye contact occurs, flush with water for 15 minutes and obtain medical attention. Read and understand all cautions on container labels and safety data sheets before using this material.

KEEP OUT OF REACH OF CHILDREN.

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**
REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Components	Resin and hardener
Solids content	100%
Color	Yellow
Mixed viscosity (77°F, Brookfield LV-DVE), ASTM D2196	800 cP
Working time	10 minutes
Tack-free time	2 hours
Foot traffic	2.5 hours (when broadcast with sand)
Coverage at 10 mil	160 ft² per gallon (14.9 m² per liter)

All data produced at 70°F (21°C)

Application Conditions

Ideal temperature	60°F to 75°F (15.5°C to 23.8°C)
Acceptable temperature	40°F to 90°F (4.4°C to 32.2°C)
Concrete pH	10-13
MVER (Moisture Vapor Emission Rate)	MVER ≤10 lbs/1000 sq ft per 24 hrs (ASTM F1869) [MVER ≤4.53 kg/93 sq m per 24 hrs (ASTM F1869)]
Relative humidity (RH)	≤100% (ASTM F2170)

Typical Characteristics

Hardness, ASTM D2240	80 Shore D
Adhesion to concrete	>500 psi (3.44 MPa)
Compressive strength, ASTM D695	9,850 psi (67.9 MPa)
Flexural strength, ASTM D790	9,680 psi (66.5 MPa)
VOC content	0 g/L

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

TXP™ SUPERFAST

Super Fast Cure, 100% Solids, Two-Component, Alkali Resistant Epoxy Primer

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® TXP™ SUPERFAST is a two-component, 100% solids, high performance, ultra-fast-setting, epoxy primer. It is designed for use with Rapid Set® TRU® flooring products. TXP SUPERFAST has been specially formulated to have excellent substrate wetting capabilities to promote penetration and adhesion. Overlayment can be placed in as little as 2.5 hours at 70°F (21°C). TXP SUPERFAST is moisture tolerant and resistant to elevated pH levels. It is not designed to be a moisture vapor barrier.

SURFACE PREPARATION: TXP SUPERFAST is used on properly prepared concrete. Surface must be dry, porous, clean, sound, and free of grease, oil, curing compounds, dust, mastic and other contaminants or bond breakers. Mechanically profile the surface to achieve ICRI Concrete Surface Profile (CSP) 3-5. Shot blasting is the best method to prepare the substrate. Acid etching the concrete surface is not permitted. Upon completion of mechanical preparation, remove all shot, dust, dirt and debris. Determine the substrate Moisture Vapor Emission Rate (MVER) per ASTM F1869 prior to placing TXP SUPERFAST. Acceptable substrates have an MVER less than or equal to 10 lbs/1,000 sq ft per 24 hours and relative humidity less than or equal to 100%.

MIXING: TXP SUPERFAST is a fast-cure epoxy designed for fast-track projects. Organize work so that all personnel and equipment are in place before mixing. For 2.2-gallon kits, remove TXP SUPERFAST Part B and the liner from the can to reveal TXP SUPERFAST Part A. Mix Part A for 2 minutes with a drill and Jiffy-type paint mixer. Add the entire contents of Part B to the entire contents of Part A and mix **for an additional 2 minutes if material temperatures are 60-90°F (16-32°C). If material temperatures are 40-60°F (4-16°C), mix for 3 minutes after combining parts A and B. Proper proportioning and homogenization are absolutely critical for success; do not attempt to mix partial kits. Use the drill and Jiffy-type mixer to mix at slow speed (less than 500 rpm) to avoid air entrainment. Do not hand mix.** Ensure that the material from the sides and bottom of the container has been thoroughly mixed in.

PLACEMENT: Upon completion of mixing, immediately pour the entire mixed TXP SUPERFAST kit onto the surface. Mixed material left in the bucket will rapidly generate heat and become unusable. Spread the TXP SUPERFAST with a flat squeegee to the appropriate coverage rate: 133 ft² (12 m²) per gallon at 12 mils (0.30 mm) thickness or 160 ft² (15 m²) per gallon at 10 mils (0.25 mm) thickness. To achieve a uniform thickness, back roll perpendicular to the squeegee application with a 1/2" (12.7 mm) nap roller. Use a paint brush for hard to reach areas. Immediately broadcast with clean, dry silica sand (#20 or #30 mesh) to rejection [approximately 50 lbs to 75 lbs per 100 ft² (2.4 kg to 3.7 kg per m²)]. All sand must be completely broadcast in less than 15 minutes at 70°F (21°C) or 7 minutes at 90°F (32°C). Sweep and vacuum to remove all loose sand after a minimum curing period of 2.5 hours. Areas that are bare or not seeded to rejection must be recoated. Within 12 hours, those areas may be reprimed and rebroadcast. After 12 hours, those areas must be mechanically abraded, primed, broadcast and cured prior to proceeding.

Surface and ambient temperatures must be between 40°F and 90°F (4°C and 32°C). At 70°F (21°C), TXP SUPERFAST has a working time of 10 minutes. Higher temperatures will significantly shorten the pot life, working time, and sand receiving time. Lower temperatures will extend the working time and may delay the time in which loose sand may be removed.

OVERVIEW

Highlights:

- Ready for overlayment in as little as 2.5 hours
- High bond strength: Excellent adhesion to concrete
- Seals concrete, minimizes pinholes in overlayment
- 100% solids, low odor, no VOC
- Low viscosity, deep penetrating

Tested in accordance with:

ASTM: D2196, D2240, D695, D790

MasterFormat® 2016

03 05 00	Concrete bonding agents, admixtures and adhesives

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

TXP™ SUPERFAST

Super Fast Cure, 100% Solids, Two Component, Alkali Resistant Epoxy Primer

JOINTS & REPAIRS: Non-moving cracks may be filled with the TXP SUPERFAST epoxy. For spalls, prime the surface with TXP SUPERFAST, then fill with epoxy mortar made using a mixture of 1 part TXP SUPERFAST and up to 5 parts dry, graded sand by volume. Once the repair area has been filled, continue with the application coat of the TXP SUPERFAST and subsequent system installation in accordance with product requirements. All moving joints must be honored through the finished floor and filled with an appropriate joint sealant or filler. TXP SUPERFAST should not be used in expansion joints, isolation joints, construction joints or any moving cracks.

CLEAN-UP: Use acetone to remove TXP SUPERFAST from tools and surrounding areas before it hardens.

COVERAGE & PACKAGING: TXP SUPERFAST is available in 1-gallon (3.8 L) and 2.2-gallon (8.3 L) kits. Coverage is 160 ft^2 (15 m^2) per gallon at 10 mils (0.25 mm) thickness. Coverage rate is approximate and will vary due to the porosity and surface profile of the concrete substrate.

SHELF LIFE: TXP SUPERFAST has a shelf life of 18 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. Contact CTS prior to product installation when additional information is required, or when project conditions are not in compliance with specifications and/or installation requirements.

Always comply with subsequent manufacturer's testing and installation requirements when their products are used in conjunction with Rapid Set® TRU® flooring products.

WARNING: AVOID BREATHING OF VAPORS. FORCED LOCAL EXHAUST IS RECOMMENDED TO EFFECTIVELY MINIMIZE EXPOSURE. NIOSH approved, organic vapor respirators and forced exhaust must be used in confined areas, when conditions (such as heated polymer, sanding) may cause high vapor concentrations, or when applying large volumes. Hazardous vapor is released when an epoxy is burned. Avoid skin or eye contact. Wash skin with soap and water if contact occurs. If eye contact occurs, flush with water for 15 minutes and obtain medical attention. Read and understand all cautions on container labels and safety data sheets before using this material.

KEEP OUT OF REACH OF CHILDREN.

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**
REPRODUCTIVE HARM - www.P65Warnings.ca.gov

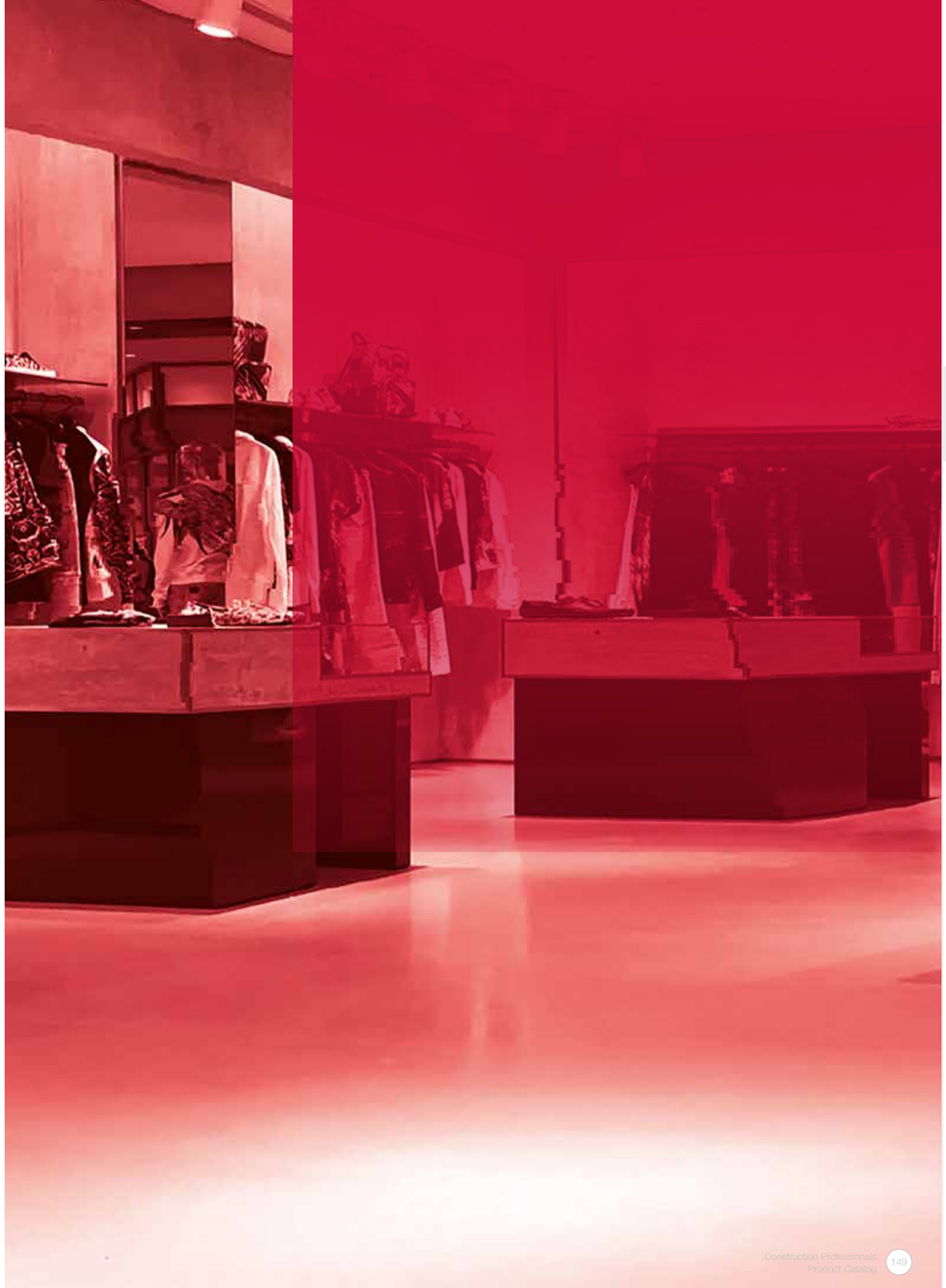
TYPICAL PHYSICAL DATA

Components	Resin and hardener
Solids content	100%
Color	Yellow
Mixed viscosity (77°F, Brookfield LV-DVE), ASTM D2196	800 cP
Working time	10 minutes
Tack-free time	2 hours
Foot traffic	2.5 hours (when broadcast with sand)
Coverage at 10 mil	160 ft^2 per gallon (14.9 m^2 per liter)

All data produced at 70°F (21°C)

Application Conditions	
Ideal temperature	60°F to 75°F (15.5°C to 23.8°C)
Acceptable temperature	40°F to 90°F (4.4°C to 32.2°C)
Concrete pH	10-13
MVER (Moisture Vapor Emission Rate)	MVER ≤10 lbs/1000 sq ft per 24 hrs (ASTM F1869) [MVER ≤4.53 kg/93 sq m per 24 hrs (ASTM F1869)]
Relative humidity (RH)	≤100% (ASTM F2170)

Typical Characteristics	
Hardness, ASTM D2240	80 Shore D
Adhesion to concrete	>500 psi (3.44 MPa)
Compressive strength, ASTM D695	9,850 psi (67.9 MPa)
Flexural strength, ASTM D790	9,680 psi (66.5 MPa)
VOC content	0 g/L



GROUTING

DATASHEETS

- CTS Construction Grout
- UltraFlow® 4000/8

CTS CONSTRUCTION GROUT

Multi-Purpose, Non-Shrink, Contractor Grade ASTM C1107 Grout

PRODUCT DATASHEET

DESCRIPTION: CTS CONSTRUCTION GROUT is a versatile, non-shrink grout that can be mixed to any consistency from damp pack to fluid. CONSTRUCTION GROUT is a high quality blend of portland cement, non-shrink additives, and specialty sand. When mixed with water, CONSTRUCTION GROUT produces a durable, high-strength material that can be used for grouting and general concrete applications on interior and exterior projects. The final color of CONSTRUCTION GROUT is gray.

USES: Use CONSTRUCTION GROUT for structural and non-structural applications, including precision grouting, base plates, precast components, machinery and equipment bases, anchor bolts, keyway joints, load bearing pads, and other non-shrink applications.

SURFACE PREPARATION: Concrete surfaces must be clean, sound, and free from any materials that may inhibit bond such as oil, dirt, asphalt, sealing compounds, acids, wax, and loose debris. When bonding is important, all surfaces must be mechanically abraded by scarifying, grinding, shot blasting, or other approved methods. Placement area must be between 45°F to 90°F (7°C to 32°C). Saturate the substrate with clean water for a minimum of 4 hours. Remove any standing water or puddles before placement of the material.

FORMS: Construct forms to be watertight and non-absorbent. Joints must be sealed with polyurethane foam, caulk, or putty. Forms must be coated or lined with bond breaker or form release. Provide adequate vent holes to avoid air entrapment. Construct a head placement at a 45 degree angle to facilitate the grout pour. Build forms 1" (2.5 cm) higher than the base of the plate and 1" to 3" (2.5 cm to 7.6 cm) between all sides of the plate and form.

MIXING: The use of a power-driven mechanical mixer, such as a mortar mixer or a drill-mounted mixer, is required. Add potable water, then add dry grout material while mixing. Adjust water temperature to ensure the mixed grout is between 45°F and 90°F (7°C and 32°C). Mix for a minimum of 4-5 minutes. Working time is approximately 15-20 minutes.

Consistency of the grout is dependent on jobsite variables such as ambient temperature, water temperature, product temperature, and mixing method.

USE THE FOLLOWING MIX WATER GUIDELINES:

Plastic consistency – 3.5 quarts (3.3 L)

Flowable consistency – 4.0 quarts (3.8 L)

Fluid consistency – 5.5 quarts (5.2 L)

Adjust the water to achieve the desired flow consistency. Do not exceed 5.5 quarts (5.2 L) of water per 50-lb (22.7-kg) bag. Adding too much water may induce bleeding and segregation. Fluid consistency is achieved when the material flows through the flow cone in 25 to 35 seconds per ASTM C939.

For deep pours over 2" (5.1 cm), extension is required. Add up to 25 lbs (11.3 kg) of clean, dry 3/8" (0.95 cm) pea gravel per 50-lb (22.7-kg) bag. Do not exceed an 8" (20.3 cm) slump (ASTM C143) to prevent segregation. This may require less than the stated

OVERVIEW

Highlights:

- Non-Shrink: Provides dimensional stability and enhanced durability for precision grouting and concrete application
- Quick Setting: Minimizes downtime and ready for loading in 24 hours
- Multi-Purpose: Use for grouting, anchoring and many general concrete applications
- Mix To Any Consistency: From damp pack to fluid
- High Strength: Achieves 10,000 psi (69 MPa) compressive strength in 28 days at flowable consistency
- Easy To Use: Just add water

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 Grouting
03 01 70	Maintenance of Mass Concrete
03 60 00	Grouting
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CTS CONSTRUCTION GROUT

Multi-Purpose, Non-Shrink, Contractor Grade ASTM C1107 Grout

maximum [5.5 quarts (5.2 L)] water dosage. Do not add any additional dry materials such as cement, sand, additives or admixtures.

PLACEMENT: Place grout continuously into forms in one placement. CTS CONSTRUCTION GROUT may be placed by pump. All machinery near grout placement must be shut down for 24 hours. Limit the amount of vibration during grout placement to reduce potential segregation. CONSTRUCTION GROUT must fill all areas and stay in contact with load bearing area. Remove forms once grout has achieved final set.

CURE: Use a curing compound in accordance with ASTM C309 upon final set or wet cure with clean potable water on open surfaces for three days.

YIELD & PACKAGING: CONSTRUCTION GROUT is available in 50-lb (22.7-kg) bags. One 50-lb (22.7-kg) bag will yield 0.38 ft^3 (0.01 m^3) at a flowable grout consistency. Coverage may vary due to jobsite conditions.

TEMPERATURE: CONSTRUCTION GROUT may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

SHELF LIFE: CONSTRUCTION GROUT 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Consistency	Plastic	Flowable	Fluid
Set Time, ASTM C266			
Initial set (hours)	4.5	5.5	6.5
Final set (hours)	6.5	7.5	10
Compressive Strength, ASTM C109 Mod.			
24 hours (psi)	4000 psi (27.6 MPa)	3200 psi (22 MPa)	2500 psi (17.2 MPa)
7 days (psi)	9000 psi (62 MPa)	8000 psi (55.2 MPa)	7000 psi (48.3 MPa)
28 days (psi)	11000 psi (75.8 MPa)	10000 psi (68.9 MPa)	9000 psi (62 MPa)
Post Hardened Height Expansion, ASTM C1090			
28 days	0-0.3%	0-0.3%	0-0.3%
Prehardened Height Expansion, ASTM C827			
At Final Set	0-1%	0-1%	0-1%

Data is obtained through laboratory conditions at 70°F

ULTRAFLOW® 4000/8

Non-Shrink Precision Grout

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® ULTRAFLOW® 4000/8 is a high-performance, non-shrink precision grout with long flow life and rapid strength gain. ULTRAFLOW is a high quality blend of Rapid Set cement, additives, and specially graded sand that can be mixed to any consistency from damp pack to fluid with an extended working time to allow for large placements, but gains strength quickly and reaches 4000 psi in 8 hours. ULTRAFLOW is non-metallic and no chlorides are added. ULTRAFLOW is ideal for grouting under base plates and large machinery installations where rapid strength gain and high durability are desired.

USES: ULTRAFLOW is used for structural and non-structural applications, including precision grouting under base plates, precast components, machinery and equipment bases, keyway joints, load bearing pads, columns, anchor bolts, dowel rods and other indoor/outdoor non-shrink applications.

SURFACE PREPARATION: Concrete substrate must be clean, sound, have a rough texture with exposed aggregate, free from oil, dirt, asphalt, sealing compounds, acids, wax, and loose debris. Bolt holes must be cleaned out and grouted in advance to prevent sagging. Remove rust and scale from metal surfaces. Equipment must be secured in place to prevent movement during the grouting procedure. Substrate must be SSD (Saturated, Surface Dry). Saturate the substrate with clean water for a minimum of 4 hours and preferably 24 hours before grout placement. Remove any standing water or puddles before placement of the material. Protect baseplate and concrete base from temperature extremes, such as direct sunlight for 24 hours prior to and following grouting.

FORMS: Forms must be watertight and non-absorbent. Use polyurethane foam, putty, or caulk to seal the joints. Forms must be coated or lined with bond breaker or form release. Provide adequate vent holes to avoid air entrapment. Provide a head placement of 45 degree angle to facilitate placement for grout pour. Build forms 1" higher than bottom of plate and leave 2" to 3" between side of plate and form.

MIXING: Mix with a mechanical mortar mixer or an electric drill with a paddle device if possible. **ULTRAFLOW may be mixed with up to 5.5 quarts (5.2 L) of water per 55-lb (25 kg) bag for fluid consistency. Use less water to achieve flowable or plastic consistency.** Add potable water to the mechanical mixer or bucket first, then add dry grout material while mixing Adjust water temperature to maintain mixed grout temperature between 45°F and 90°F (7°C and 32°C). Mix thoroughly for a minimum of 3 to 5 minutes. Adding too much water may induce bleeding and segregation. Gauge fluid consistency within 25 to 35 seconds with ASTM C939 Flow Cone Method. ULTRAFLOW is fluid for 30 minutes and remains workable for 1 hour. Consistency of the grout is dependent on jobsite variables such as ambient temperature, water temperature, product temperature and mixing method. For deep pours over 2", 3/8" pea gravel may be added but only after consulting with the CTS Cement Technical Service Department. Do not add any additional dry materials such as cement, sand, additives or admixtures.

OVERVIEW

Highlights:

- Non-Shrink: Durable bearing support and load transfer
- Rapid Return to Service: Exceeds 4000 psi (27.6 MPa) in 8 hours
- Long Flow Life & Extended Working Time: Fluid for 30 minutes
- Effective Bearing Area: 98% area provides maximum support and load transfer
- Versatile: Mix to any consistency - fluid, flowable, plastic or damp pack
- Freeze Thaw Resistant: Durable in the harshest climates

Conforms to:

- ASTM C1107
- Army Corps of Engineers CRD C621

MasterFormat® 2016

03 01 60	Maintenance of Grouting
03 60 00	Grouting
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

ULTRAFLOW® 4000/8 Non-Shrink Precision Grout

PLACEMENT: The concrete, plate, and ambient temperatures must be from 45°F to 90°F and remain in that range until the grout has reached final set. Place grout continuously onto the 45 degree headbox from one side of the plate to minimize air entrapment. ULTRAFLOW must fill the entire space being grouted and remain in contact with the plate. Use multiple mixers if required to ensure continuous placement. It is important for the grout to extend at least 1/2" up the edges of the plate to provide a small head pressure that will keep the grout in contact with the plate bottom. Do not vibrate the grout. The grout shoulder may be cut back as soon as the strength is sufficient to maintain its formed shape. Immediately after cut back and finishing, cover with clean wet rags until final set. Have all required tools, equipment and materials as close to the grouting area as possible.

CURING: Apply a curing compound in accordance with ASTM C309 immediately or wet cure with clean potable water on open surfaces after initial set for 6–8 hours. Once forms are removed, use preferred curing method on exposed grout surfaces. Grouted equipment may be put into service as soon as desired grout strengths are achieved.

YIELD & PACKAGING: ULTRAFLOW is available in 55-lb (25 kg) bags. One 55-lb bag of ULTRAFLOW will yield approximately 0.5 ft^3 (0.01 m^3).

SHELF LIFE: ULTRAFLOW 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.

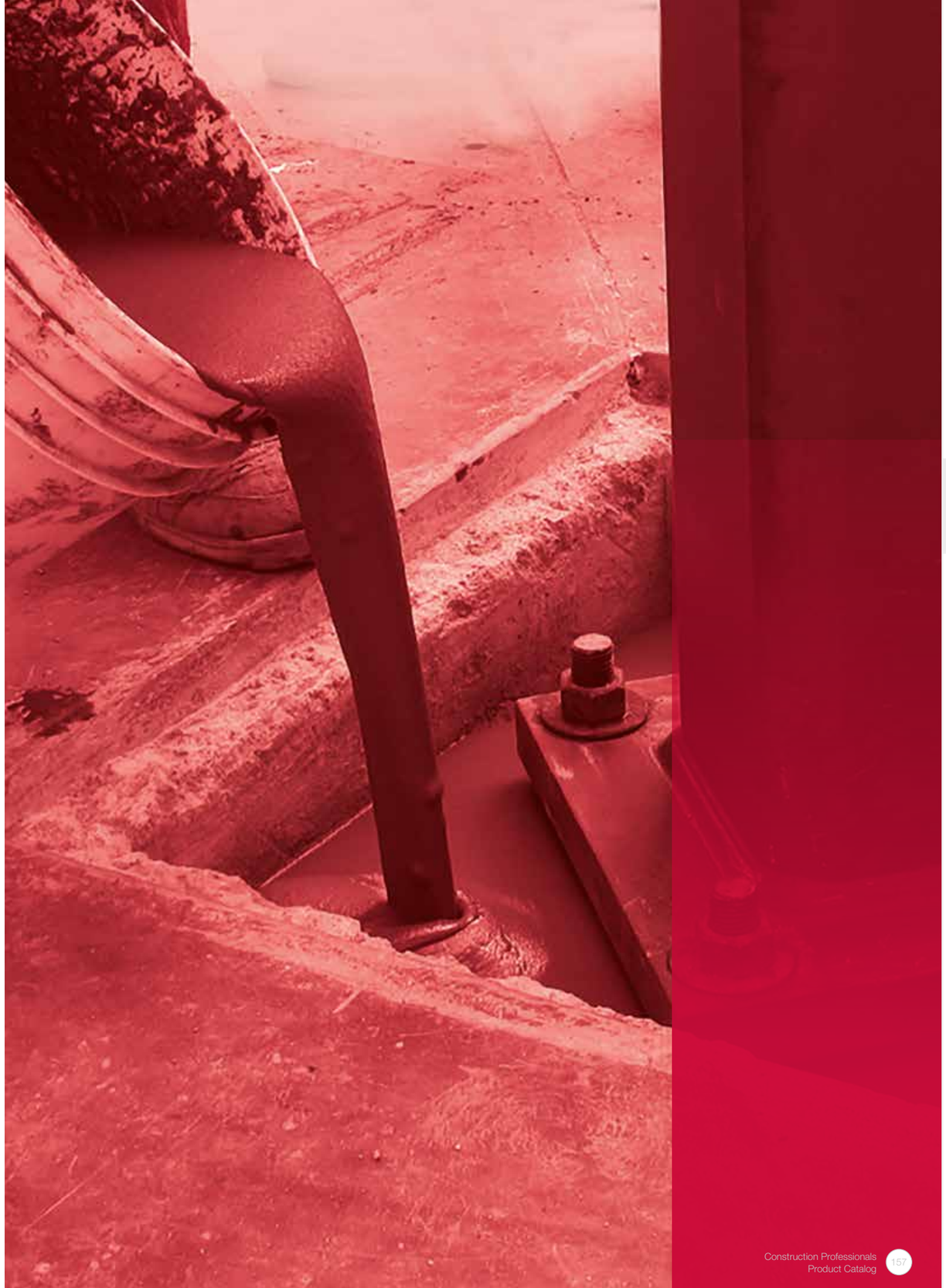
LIMITED WARRANTY: CTS CEMENT MANUFACTURING CORP. (CTS) warrants its materials to be of good quality and, at its option, will replace or refund the purchase price of any material proven to be defective within one (1) year from date of purchase. The above remedies shall be the limit of CTS' responsibility. 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C191 Mod.	
Initial set	95 minutes
Final set	150 minutes
Compressive Strength, ASTM C109 Mod.	
8 hours	4000 psi (27.6 MPa)
1 day	6500 psi (44.8 MPa)
3 days	7500 psi (51.7 MPa)
7 days	8000 psi (55.2 MPa)
28 days	8500 psi (58.6 MPa)
Slant Shear Bond, ASTM C882 per C928	
28 days	2000 psi (13.8 MPa)
Freeze-Thaw Resistance, ASTM C666	
300 Cycles	99%

All data produced at fluid consistency at 70°F (21°C)



PAVEMENT & OVERLAYS

HIGHWAY, AIRPORT & BRIDGE CONSTRUCTION

DATASHEETS

- DOT Cement
- DOT Concrete Mix
- DOT Repair Mix
- DOT Repair Mortar
- Low-P™ Cement
- Low-P™ FA1 Cement
- Low-P™ Repair Mortar
- Rapid Set® Cement

HIGHWAY, AIRPORT, & BRIDGE CONSTRUCTION

WITH RAPID SET® CEMENT

CTScement.com

Rapid Set®

AVAILABILITY & SUPPORT

Rapid Set® cement products are available worldwide and are shipped in bulk, one-ton bulk bags, smaller bags, and other custom packaging.

The Engineering Team at CTS Cement can provide training, mix design development, and any other form of technical support. We are dedicated to ensuring the successful use of Rapid Set® Cement.

A RAPID STRENGTH, DURABLE, LOW CARBON CONCRETE

Current demands on concrete infrastructure require an innovative material capable of providing the benefits of portland cement, without its traditional limitations of slow strength gain, high shrinkage, and large carbon footprint.

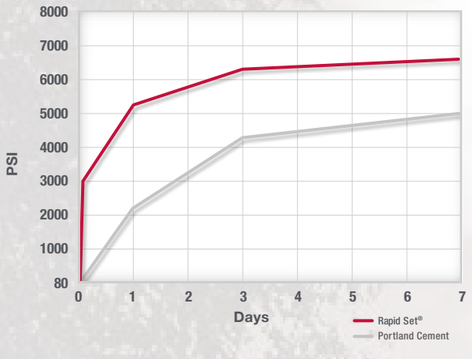
Rapid Set® cement is the material of choice for accelerated repair and construction when concrete infrastructure must be returned to service within hours. Its carbon footprint is a fraction of that of portland cement.

Rapid Set® cement is approved by Airport and Highway Agencies worldwide. It has an established record of success of more than 40 years.

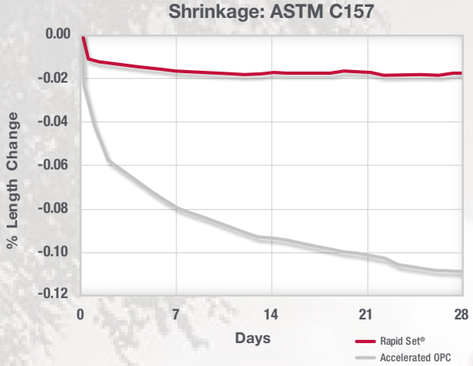
KEY CHARACTERISTICS
OF RAPID SET® CEMENT TECHNOLOGY

- Rapid Set® cement does not require blending.
- It does not contain portland cement.
- It does not require the use of expensive organic additives.
- It has been used on highways and airports worldwide for more than 40 years.

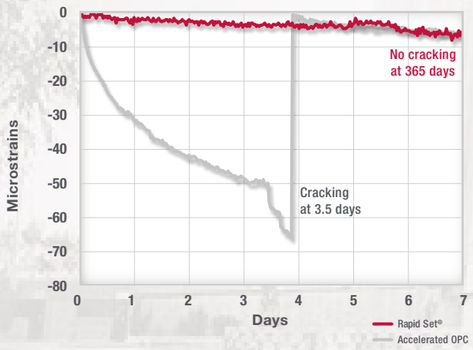
Compressive Strength: ASTM C109



Shrinkage: ASTM C157



Crack Potential: ASTM C1581



1. RAPID STRENGTH

Rapid Set® is a belitic calcium sulfoaluminate (BCSA) cement. Upon mixing with water, the calcium sulfoaluminate in Rapid Set® reacts to create interlocking crystals of ettringite, resulting in rapid strength development. Structural strength can be achieved in less than 2 hours, allowing new concrete placements to be returned to service quickly and minimizing the downtime of critical transportation infrastructure.

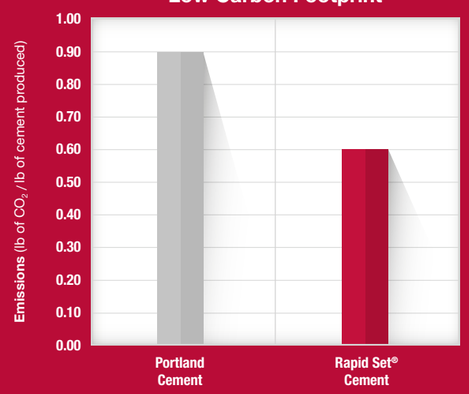
2. DURABILITY

Rapid Set® cement exhibits low shrinkage, which minimizes cracking potential. It also exhibits exceptional resistance to sulfate attack and alkali silica reactivity. All these factors contribute to the excellent durability of Rapid Set®. Rapid Set® cement meets the performance requirements of ASTM C1600 for Rapid Hardening Hydraulic Cements.

3. SUSTAINABILITY

The carbon footprint of Rapid Set® cement is 30% less than that of portland cement. This unique characteristic is due to the low processing temperature of the cement and special raw material proportions. This sustainability increase is achieved without the addition of supplementary cementitious materials or a reduction in cement content.

Low Carbon Footprint



FOUR WAYS OF SPECIFYING RAPID SET® FOR YOUR PROJECT

1 USE AN ASTM SPECIFICATION
Specify ASTM C1600 – VRH, MRH, GRH

2 USE A PERFORMANCE SPECIFICATION
For example: 3,000 psi (20.7 MPa) compressive strength at 2 hours, or 400 psi (2.75 MPa) flexural strength at 2 hours

3 USE A MINERALOGICAL SPECIFICATION
Specify a cement with a minimum of 20% calcium sulfoaluminate and 40% dicalcium silicate (belite)

4 USE A PRODUCT SPECIFICATION
Specify Rapid Set® cement manufactured by CTS Cement Manufacturing Corporation, or an approved equivalent

VERSATILITY IN CONCRETE DELIVERY

VOLUMETRIC TRUCKS
ASTM C685

- On Demand Start/Stop
- No Concrete Waste
- Unaffected by Haul Time

READY MIX TRUCKS
ASTM C94

- Large Volume Production
- Widespread Availability
- Familiar Machinery

BAGGED PRODUCTS
ASTM C928

- DOT Concrete Mix
- DOT Repair Mix
- DOT Cement

HIGHWAY PAVEMENT

FULL-DEPTH REPLACEMENT

Rapid Set® cement is used for highway pavement rehabilitation. The combination of fast strength and durability makes it the cement of choice when concrete pavement must be returned to service quickly.

GENERAL CONCRETE REPAIR

Rapid Set® cement is used for the general repair of concrete. Spall repair, pothole repair, partial-depth repair, and joint repair can all be performed quickly and reliably using Rapid Set®.

LEAN CONCRETE BASE

Rapid Set® Lean Concrete Base (RSLCB) is ideal under cast-in-place or precast concrete slabs on fast-track projects. A typical cement content of 400 lb/yd3 will develop strength in 1-2 hours.

DOWEL BAR RETROFIT

Rapid Set® cement is ideal for dowel bar retrofit. The combination of rapid strength and low shrinkage allows quick reopening of the pavement and effective long-term load transfer.

FLOWABLE FILL

Rapid Set® Flowable Fill (RSFF) is used on fast-track projects where the fill material needs to gain strength quickly to allow other parts of the project to continue. It is a low cement content material that will set up within one hour.

PRECAST PANEL GROUT

Rapid Set® cement is used for fast-track precast panel grouting projects. The grout material is highly fluid with no segregation and achieves required strengths quickly.

Panel Replacement at the Lincoln Tunnel, New York City

Emergency Panel Replacement on I-80, Nevada

Dowel Bar Retrofit on I-5, Washington

CASE STUDY

2,000 LANE-MILES OF FULL-DEPTH PANEL REPLACEMENT IN CALIFORNIA

Rapid Set® cement has been used for full-depth overnight panel rehabilitation on California highways for more than 20 years. With Rapid Set®, it is possible to close lanes to traffic at 11 p.m., remove and replace the concrete pavement, and re-open to traffic at 5 a.m.

Many other states have adopted this rehabilitation strategy to maintain highway pavement infrastructure without adversely affecting the traveling public. Typically, a compressive strength of 3,000 psi (20.7 MPa) in 2 hours is required.

AIRFIELD PAVEMENT

Rapid Set® cement is used worldwide for repair of concrete airfield pavement. It is used for spall repairs, partial-depth repair, full-depth replacement, and lighting upgrades.

Rapid Set® is used at airports worldwide for the rehabilitation of critical runways, aprons, taxiways, and in situations where extended closures times are difficult or impossible.

With Rapid Set® cement, it is possible to achieve 550 psi (3.8 MPa) flexural strength in 3 hours, allowing a runway, gate or taxiway to reopen in a few hours.

TYPICAL MIX DESIGN

MATERIAL	U.S. UNITS	S.I. UNITS
Rapid Set® Cement	658 lbs/yd3	390 kg/m3
Coarse Aggregate	1,697 lbs/yd3	1,006 kg/m3
Fine Aggregate	1,247 lbs/yd3	739 kg/m3
Water	263.2 lbs/yd3	156 kg/m3
Super Plasticizer	8 fl oz/cwt	1.6 l/m3
Retarder	8 fl oz/cwt	1.6 l/m3
W/C Ratio	0.40	0.40

Early strength is achieved without the high cement content needed with other High Early Strength (HES) materials. High cement content increases shrinkage and leads to early age cracking and premature failure.

Accelerating admixtures are not required, avoiding unpredictable setting times.

The retarding admixture dosage can be easily adjusted to accommodate ambient temperatures, haul times, and placement requirements. Working time can be extended up to one hour.

W/C ratio does not need to be extremely low, like other HES materials. This allows for concrete that is very workable and easy to place.

AGE	FLEXURAL STRENGTH	
4 Hours	600 psi	4.1 MPa
24 Hours	700 psi	4.8 MPa
28 Days	800 psi	5.5 MPa

Rapid Set® cement concrete complies with FAA P501. Most airfield pavement specifications require a minimum flexural strength of 550 psi (3.8 MPa) to open to aircraft traffic. 28 day strength requirements are often 650 psi (4.5 MPa).

CASE STUDY

SEATTLE-TACOMA AIRPORT

SEA-TAC Airport was the first major international airport to use Rapid Set® cement for airfield pavement rehabilitation, starting in 1994. Since then, the airport has placed more than 40,000 cubic yards (30,000 cubic meters) of Rapid Set® cement concrete, including full-depth runway, taxiway, and apron panels. It is still used regularly by the airport, particularly in high traffic areas where only nighttime closures are possible. Rapid Set® cement concrete reaches the required opening strength of 550 psi (3.79 MPa) flexural in two hours.

The successful experience at SEA-TAC Airport opened the door to the use of Rapid Set® at airports worldwide.

CONSTRUCTION SEQUENCE

0:00-0:30
Concrete Removal

0:30-0:45
Base Preparation

0:45-1:00
Dowel Installation

1:00-1:30
Concrete Placement

1:30-2:00
Concrete Finishing

2:00-5:00
Concrete Pavement Reopened

BRIDGES

BRIDGE DECK OVERLAYS

CORROSION PROTECTION – Rapid Set® cement is used on concrete bridge deck overlays. In colder environments where de-icing salts are frequently used, a low permeability concrete overlay is often required. Rapid Set® cement provides two unique solutions that provide low chloride permeability, low shrinkage, and opening strength in less than 3 hours.

RAPID SET® LATEX MODIFIED CONCRETE (RSLMC) – Rapid Set® cement concrete can be modified with the addition of liquid latex. RSLMC complies with the guidelines of ACI 548 - VESLMC.

RAPID SET® LOW-P™ – a unique product that incorporates the latest migrating corrosion inhibiting technology. It can be delivered as a liquid admixture or a pre-blended cement, which removes the need for an additional admixture tank or expensive latex-handling equipment. It drastically decreases the permeability of the concrete to chloride diffusion.

BRIDGE DECK PATCHING

Rapid Set® cement is used for partial-depth and full-depth repairs. It is an ideal repair material for fast-track projects with limited closure times.

PRECAST CONNECTIONS

Rapid Set® cement is used for closure pours in between precast panels. The concrete achieves the required strength within 2-3 hours and is a lower cost solution than proprietary UHPC alternatives.

STRUCTURAL CONCRETE

Rapid Set® cement is used for structural concrete applications such as bridge hinge reconstruction, seismic joints, and other general structural repairs.

CASE STUDY

DRY CANYON CREEK BRIDGE

The Dry Canyon Creek Bridge near Mosier, Oregon, is part of the Historic Columbia River Highway, a 70-mile scenic roadway that runs through the Columbia River Gorge and provides drivers with impressive, often bird's-eye views of foliage, dams and waterfalls. Built in the 1920s, the nearly 100-year-old bridge was experiencing significant spalling, delamination and honeycomb cracking. Areas under the deck overhangs had exposed and corroded steel reinforcement; some deck joints and storm drains were leaking directly onto portions of the structure below, such as the arches, accelerating the deterioration of the concrete.

In 2018, the Oregon Department of Transportation (ODOT) reconstructed the concrete portions of the bridge. The bridge was allowed to be completely closed for one hour—a longer time period would have meant rerouting traffic 50 miles to bypass the 100-foot, two-lane bridge. For this reason, Rapid Set® Low-PTM Cement concrete was chosen as the repair material.

The contractor began work at 8 a.m., placing concrete on one side of the bridge with a volumetric mixer. The bridge was closed around lunchtime to transfer equipment to the other side, and was opened to light traffic an hour later. The crew began work on the other side of the bridge after lunch and had both lanes back in service by 6 p.m. the same day.

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 CO_2 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/cm^3. 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 water cured. Keep exposed surfaces wet for a minimum of 1 hour. Begin curing after the material starts to harden and

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:

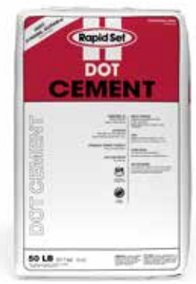
State (DOT) and local approvals

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

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com



DOT CEMENT Industrial Grade, Fast-Setting Cement

before 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 is to maintain a continuously wet surface until the product has achieved sufficient strength.

Alternative curing methods may be suitable in some applications. Methods include, but are not limited to, the use of surface applied curing compounds conforming to ASTM C309. The material formulator 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 ft^3 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.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)

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

DOT CONCRETE MIX

High-Performance, Fast-Setting, Multi-Purpose Concrete Repair Material

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® DOT CONCRETE MIX is a high-performance, polymer-modified, fast-setting, fiber reinforced concrete repair material. Durable in wet environments, DOT CONCRETE MIX is a blend of Rapid Set hydraulic cement, high performance additives, fibers and quality ASTM C33, 3/8" aggregates. DOT CONCRETE MIX has been specially formulated to match the color of typical portland cement concrete. DOT CONCRETE MIX is non-metallic and no chlorides are added. Combine DOT CONCRETE MIX with water to produce a workable, quality concrete repair material that is ideal where fast strength gain, high durability and low shrinkage are desired. Integral Rapid Set® Corrosion Inhibitor and air entrainment additives are already added to increase protection of embedded reinforcement and freeze thaw durability. DOT CONCRETE MIX achieves structural strength within 2 hours.

USES: Use DOT CONCRETE MIX for general and structural concrete repair, highway repair, footings, airport pavements, construction of pavements, bridges, parking decks, ramps, sidewalks, steps, joint repair and formed work.

ENVIRONMENTAL ADVANTAGES: Use DOT CONCRETE MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply DOT CONCRETE MIX in thicknesses from 2" to 24" (5 cm to 61 cm). For thinner applications, Rapid Set® DOT Repair Mix, Rapid Set® DOT Repair Mortar, Rapid Set® Mortar Mix, Rapid Set® Mortar Mix Plus or Rapid Set® V/O Repair Mix.

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 CONCRETE MIX 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 required. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **DOT CONCRETE MIX may be mixed using 3.0 to 3.5 quarts (2.8 L to 3.3 L) of water per 60-lb (27.2-kg) bag. Use less water to achieve higher strengths. Do not exceed 3.5 quarts (3.3 L) of water per bag.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add approximately two-thirds of the DOT CONCRETE MIX and continue mixing for 30 to 60 seconds. While mixing, add the remaining DOT CONCRETE MIX. Mix for an additional 1 to 2 minutes or until a lump-free, uniform consistency is achieved. Do not retemper.

PLACEMENT: DOT CONCRETE MIX 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. On flat work, do not install in layers; install full depth sections and progress horizontally. Do not wait for bleed water; apply final finish as soon as possible. DOT CONCRETE MIX may be troweled, floated or broom finished. The working time for DOT CONCRETE MIX is 15 to 20 minutes at 70°F (21°C). To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water.

OVERVIEW

Highlights:
Fast: Ready for traffic and loading in 2 hours
Durable: Formulated for long life in critical applications
Integral Corrosion Inhibitor: Corrosion resistance for embedded reinforcement
Polymer modified
Fiber reinforced
Air Entrained: Freeze thaw durability
Concrete gray color
Structural: For repair and new construction
Multi-Purpose: Use for concrete repair, airport pavements, highway repair, construction of pavements and bridges, parking decks and ramps, sidewalks and steps, joint repair, formed work and more

Conforms to:
ASTM C928 R3

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 33 00	Architectural Concrete - Cast-In-Place Concrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

DOT CONCRETE MIX High-Performance, Fast-Setting, Multi-Purpose Concrete Repair Material

Do not install on frozen surfaces. DOT CONCRETE MIX may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

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 shorten 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.

CURING: Water cure all DOT CONCRETE MIX 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 is to maintain a continuously wet surface until the product has achieved sufficient strength.

YIELD & PACKAGING: DOT CONCRETE MIX is available in 60-lb (27.2 kg) bags. One 60-lb (27.2 kg) bag of DOT CONCRETE MIX will yield approximately 0.48 ft^3 (0.014 m^3).

SHELF LIFE: DOT CONCRETE MIX 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Compressive Strength, ASTM C39	
2 hours	3000 psi (20.7 MPa)
24 hours	5000 psi (34.5 MPa)
7 days	6000 psi (41.4 MPa)
28 days	6500 psi (44.8 MPa)
Splitting Tensile Strength, ASTM C496	
28 days	300 psi (2.1 MPa)
Slant Shear Bond Strength, ASTM C882 per C928	
24 hours	1700 psi (11.7 MPa)
7 days	2300 psi (15.9 MPa)
28 days	3000 psi (20.7 MPa)
Modulus of Elasticity, ASTM C469	
28 days	3.6 x 10^6 psi
Scaling Resistance, ASTM C672 per C928	
50 cycles	Visual rating - 1
Freeze Thaw Resistance, ASTM C666	
Durability factor	97%
Length Change, ASTM C157 per C928 (Air Storage)	
7 days	0.015%
28 days	0.035%
Length Change, ASTM C157 per C928 (Water Storage)	
7 days	0.001%
28 days	0.008%
Rapid Chloride Ion Penetration, ASTM C1202	
28 days	< 1000 Coulombs

Data obtained at 4" slump by ASTM C143 at 70°F (21°C)

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

DOT REPAIR MIX

High-Performance Concrete Repair Material

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® DOT REPAIR MIX is a high-performance, fast-setting, multi-purpose repair material. Durable in wet environments, DOT REPAIR MIX is a blend of Rapid Set hydraulic cement, high performance additives and ASTM C33 concrete sand. DOT REPAIR MIX is non-metallic and no chlorides are added. Mix DOT REPAIR MIX with water to produce a flowable, quality repair material that is ideal where fast strength gain, high durability and low shrinkage are desired. DOT REPAIR MIX is ready for traffic and loading within 1 hour.*

USES: Use DOT REPAIR MIX for concrete repair, highway repair, dowel bar retrofit, construction of pavements and bridges, parking decks and ramps, sidewalks and steps, joint repair and formed work. DOT REPAIR MIX contains an air-entraining admixture, in some geographical regions, for freeze thaw durability.

ENVIRONMENTAL ADVANTAGES: Use DOT REPAIR MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATIONS: Apply DOT REPAIR MIX in thicknesses from 1/2" to 2" (1.3 cm to 5.1 cm). For thicker applications up to 24" (61 cm), extend 50% to 100% with coarse aggregate. Use only clean, dry aggregate with a nominal maximum size of 3/8" to 3/4" (0.95 to 1.9 cm) conforming to ASTM C33. Contact CTS Cement for additional 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. Mechanically abrade surface and remove all unsound material. Apply DOT REPAIR MIX 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 required. Organize work so that all personnel and equipment are in place before mixing. **Use clean potable water. DOT REPAIR MIX may be mixed using 3 to 4.5 quarts (2.8 L to 4.3 L) of water per 55-lb (25-kg) bag. Use up to 5 quarts (4.7 L) when extended with dry coarse aggregate. Use less water to achieve higher strengths.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add DOT REPAIR MIX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

PLACEMENT: DOT REPAIR MIX 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. On flat work, do not install in layers; install full depth sections and progress horizontally. Do not wait for bleed water. Apply final finish as soon as possible. DOT REPAIR MIX may be troweled, floated or broom finished. The working time for DOT REPAIR MIX is 10 to 25 minutes at 70°F (21°C). To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. Do not install on frozen surfaces. DOT REPAIR MIX may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

CURING: Water cure all Rapid Set® DOT REPAIR MIX installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of water curing is to

OVERVIEW

Highlights:
Fast: Ready for traffic and loading in 1 hour
Durable: Formulated for long life in critical applications
Structural: For repair and new construction
Extendable: Add rock for large placements
Easy To Use: Mix to fluid or stiff consistency
Multi-Purpose: Use for concrete repair, highway repair, dowel bar retrofit, construction of pavements, bridges, parking decks, ramps, sidewalks, steps, joint repair, formed work and more
Conforms to:
ASTM C928 R3
California Test No. 551
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

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

DOT REPAIR MIX High Performance Concrete Repair Material

maintain the moist sheen on the entire surface until the product has achieved sufficient strength. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required. A curing compound conforming to ASTM C309 Type 2, Class B may be used. For best results, protect from direct sunlight, wind, and other conditions that may cause rapid drying of material.

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 shorten 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: DOT REPAIR MIX is available in 55-lb (25 kg) bags. One 55-lb (25 kg) bag of DOT REPAIR MIX will yield approximately 0.5 ft^3 (0.01 m^3). When extended 60% by weight with quality coarse aggregate, yield is approximately 0.7 ft^3 (0.02 m^3). When extended 100% by weight with quality coarse aggregate, yield is approximately 0.9 ft^3 (0.03 m^3).

SHELF LIFE: DOT REPAIR MIX 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Neat Bag (3.0 to 4.5 quarts)	60% Extension (3.5 to 4.75 quarts)	100% Extension (3.5 to 5.0 quarts)
Yield		
0.5 ft^3	0.7 ft^3	0.9 ft^3
Compressive Strength		
ASTM C109 Mod.	ASTM C39	ASTM C39
1 hr* 3300 psi	1 hr* 2800 psi	1 hr* 2500 psi
3 hrs 5000 psi	3 hrs 4600 psi	3 hrs 4200 psi
24 hrs 7000 psi	24 hrs 6800 psi	24 hrs 6500 psi
7 days 7500 psi	7 days 7200 psi	7 days 7000 psi
28 days 9500 psi	28 days 9000 psi	28 days 8500 psi
Flexural Strength, ASTM C78		
4 hrs 450 psi	4 hrs 400 psi	4 hrs 400 psi
7 days 700 psi	7 days 650 psi	7 days 600 psi
28 days 900 psi	28 days 850 psi	28 days 800 psi
Modulus of Elasticity, ASTM C469		
7 days 4,400,000 psi	7 days 4,100,000 psi	7 days 3,900,000 psi
28 days 5,100,000 psi	28 days 4,500,000 psi	28 days 4,000,000 psi
Slant Shear Bond Strength, ASTM C882 per C928		
1 day 1500 psi	1 day 1200 psi	1 day 1100 psi
7 days 2000 psi	7 days 1800 psi	7 days 1700 psi
Splitting Tensile Strength, ASTM C496		
7 days 700 psi	7 days 500 psi	7 days 390 psi
28 days 900 psi	28 days 600 psi	28 days 415 psi
Resistance of Concrete to Rapid Freezing and Thawing, ASTM C666 Procedure A		
Durability factor 300 Cycles: 95%	Durability factor 300 Cycles: 95%	Durability factor 300 Cycles: 95%
Scaling Resistance, ASTM C672 per C928		
Scaling of material at 25 cycles: 0.05 lb/ft^2	Visual rating at 25 cycles - 2	Visual rating at 25 cycles - 1
Length Change, ASTM C157 modified per ASTM C928		
Air Cure: -0.08% Water Cure: 0.02%	Air Cure: -0.07% Water Cure: 0.01%	Air Cure: -0.05% Water Cure: 0.05%
*Data obtained at flow consistency of 105 by ASTM C1437 at laboratory conditions	*Data obtained at slump consistency at 6" by ASTM C143 at laboratory conditions	*Data obtained at slump consistency at 6" by ASTM C143 at laboratory conditions

*After final set
Results will vary depending on aggregates and jobsite conditions

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

DOT REPAIR MORTAR

High-Performance Concrete Repair Mortar

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® DOT REPAIR MORTAR is a high-performance, fast-setting concrete repair material. Durable in wet environments, DOT REPAIR MORTAR is a blend of Rapid Set hydraulic cement, high performance additives and ASTM C33 concrete sand. DOT REPAIR MORTAR is non-metallic and no chlorides are added. Mix DOT REPAIR MORTAR with water to produce a flowable, quality repair material that is ideal where fast strength gain, high durability and low shrinkage are desired. DOT REPAIR MORTAR achieves structural strength in 1 hour after final set.

USES: Use DOT REPAIR MORTAR where high performance, rapid strength gain and early return to service is desired. DOT REPAIR MORTAR is ideal for repairing highways, bridge decks, airport pavement, industrial floors, parking garage decks, and freezer floors. DOT REPAIR MORTAR contains an air-entraining admixture for freeze thaw durability.

ENVIRONMENTAL ADVANTAGES: Use DOT REPAIR MORTAR to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply DOT REPAIR MORTAR in thicknesses from 1/2" (1.2 cm) to 6" (15.2 cm). For thicker applications up to 24" (61 cm), extend with up to 50 lbs of coarse aggregate. Use only clean, dry aggregate with a nominal maximum size of 3/8" to 3/4" conforming to ASTM C33.

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 REPAIR MORTAR 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 required. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **DOT REPAIR MORTAR may be mixed using 3.5 to 5.0 quarts (3.3 L to 4.7 L) of water per 70-lb (32-kg) bag. Use up to 5.0 quarts (4.7 L) when extended with dry coarse aggregate. Use less water to achieve higher strengths.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add DOT REPAIR MORTAR. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

PLACEMENT: DOT REPAIR MORTAR 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. On flat work, do not install in layers; install full depth sections and progress horizontally. Do not wait for bleed water. Apply final finish as soon as possible. DOT REPAIR MORTAR may be troweled, floated or broom finished. Do not install on frozen surfaces. The working time for DOT REPAIR MORTAR is 10 to 25 minutes at 70°F (21°C). To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. DOT REPAIR MORTAR may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

OVERVIEW

Highlights:

- Fast: Ready for traffic and loading in 1 hour
- Durable: Formulated for long life in critical applications
- Structural: For repair and new construction
- Extendable: Add rock for large placements
- Easy to use: Mix to fluid or stiff consistency
- Multi-purpose: Use for concrete repair, highway repair, construction of pavements, bridges, parking decks, ramps, sidewalks, steps, joint repair, formed work and more

Conforms to:

ASTM C928 R3

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

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

DOT REPAIR MORTAR High-Performance Concrete Repair Mortar

CURING: Water cure all Rapid Set® DOT REPAIR MORTAR installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of water curing is to maintain the moist sheen on the entire surface until the product has achieved sufficient strength. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required. A curing compound conforming to ASTM C309 Type II, Class B may be used. For best results, protect from direct sunlight, wind, and other conditions that may cause rapid drying of material.

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 shorten 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: DOT REPAIR MORTAR is available in 70-lb (32-kg) bags. One 70-lb (32-kg) bag will yield approximately 0.63 ft^3 (0.018 m^3). Each bag of DOT Repair Mortar may be extended to yield approximately 0.9 ft^3 (0.02 m^3), using 50 lbs of quality coarse aggregate.

SHELF LIFE: DOT REPAIR MORTAR 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C266 Mod.	
Initial set	15 minutes
Final set	30 minutes
Compressive Strength, ASTM C109 Mod.	
1 hour*	3500 psi (24.1 MPa)
3 hours	4500 psi (31.0 MPa)
24 hours	6500 psi (44.8 MPa)
7 days	8000 psi (55.2 MPa)
28 days	9000 psi (62.1 MPa)
Flexural Strength, ASTM C78	
4 hours	500 psi (3.45 MPa)
24 hours	650 psi (4.48 MPa)
28 days	1200 psi (8.27 MPa)
Slant Shear Bond, ASTM C882 per C928	
24 hours	2000 psi (13.8 MPa)
28 days	2200 psi (15.2 MPa)
Freeze/Thaw, ASTM C666	
300 cycles	Durability factor >95%

*After final set
Data obtained at flow consistency 100 by ASTM C1437 at 70°F (21°C)

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

LOW-P™ CEMENT

Low Permeability Cement

PRODUCT DATASHEET

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

APPLICATIONS: Low-P Cement 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 Cement is superior to portland cement latex modified concrete, low slump concrete, microsilica/silica fume concrete, and polyester concrete.

ENVIRONMENTAL ADVANTAGES: Use LOW-P Cement to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 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 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 Cement 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 Cement 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 Cement 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
- Fast: Minimizes downtime. Ready for traffic in 1 to 3 hours
- Durable: Low shrinkage, non-metallic, no added chlorides, sulfate resistant, freeze-thaw resistant
- Easy to place: High slump, non-segregating formula
- Environmentally friendly: Lower carbon emissions
- Corrosion Protection: Resistance to corrosion caused by chlorides (deicing salts)
- Just add water and aggregate

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 31 00	Structural Concrete Cast-in-Place
03 53 19	Concrete Overlayment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

LOW-P™ CEMENT Low Permeability Cement

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 Cement concrete mix design to determine actual field performance and suitability for the intended use.

AVAILABILITY: Low-P Cement is available nationwide in 2000-lb bulk bags and 50-lb bags.

STORAGE & SHELF LIFE: LOW-P 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

MIX DESIGNS	
Low-P™ Cement	658 lbs (298 kg)
Coarse Aggregate 3/8"-1/2"	1450 lbs (658 kg)
Fine Aggregate	1600 lbs (726 kg)
Cement Retarder*	2.4 lb (1.08 kg)
Water	296 lbs (134 kg)

PHYSICAL DATA	
Set Time, ASTM C191 Mod.	
Initial set	30 minutes
Final set	40 minutes
Slump, ASTM C143	
7-9 inches	
Compressive Strength, ASTM C39	
3 hours	4500 psi (31.0 MPa)
6 hours	6000 psi (41.4 MPa)
24 hours	7000 psi (48.3 MPa)
7 days	8000 psi (55.2 MPa)
28 days	9000 psi (62.1 MPa)
Bond Strength, ASTM C882 per C928	
24 hours	1200 psi (8.27 MPa)
7 days	1900 psi (13.1 MPa)
28 days	2200 psi (15.21 MPa)
Shrinkage, ASTM C157	
7 days	0.003%
28 days	0.023%
Freeze-Thaw, ASTM C666	
300 cycles (Durability factor)	105.1
Rapid Chloride Ion Penetration, ASTM C1202	
28 days	< 1000 Coulombs

*Citric acid can be used to extend the setting time of Low-P™ Concrete. Please contact CTS Cement for dosage recommendations. Note: Performance will vary based on actual aggregate properties and project variables. Complete trial batches to verify performance. All data produced at 70°F (21°C).

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_2 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.

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

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:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

LOW-P™ FA1 Low Permeability Cement with Fly Ash

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. 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**
CANCER and REPRODUCTIVE HARM - 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

Rapid Chloride Penetration, ASTM C1202	
28 days	< 1000 Coulombs

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.

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

LOW-P™ REPAIR MORTAR

Rapid-Setting Repair Mortar for Low Permeability Applications

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® LOW-P™ REPAIR MORTAR is a specialty mortar that produces a low permeability, corrosion resistant, fast setting concrete repair material that allows for early opening to traffic. No chlorides are added.

USES: Full and partial depth repair of concrete pavements, bridge deck overlays, elevated deck repairs, parking structures, new slab construction, formed concrete work, and grouting.

ENVIRONMENTAL ADVANTAGES: Use LOW-P REPAIR MORTAR to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

SURFACE PREPARATION: Concrete bonding surfaces must be clean, sound, and free from any materials that may inhibit bond such as oil, asphalt, curing compounds, acids, dirt and loose debris. Complete surface preparation in accordance with project specifications. Roughen surface and remove all unsound concrete. Immediately prior to placement the repair surface should be thoroughly saturated with water. Standing water and puddles should be removed from the surface.

MIXING: The use of a power-driven mechanical mixer, such as a mortar mixer or a drill-mounted mixer, is required. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water and mix whole bags only. **LOW-P REPAIR MORTAR may be mixed using 3.5 to 5 quarts of water per 70-lb bag.** Use less water to achieve higher strengths. For cold weather applications, use warm water. **CAUTION: Do not add portland cement, lime, fly ash or any other admixtures unless approved by CTS.**

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: LOW-P REPAIR MORTAR is available nationwide in 70-lb bags. One 70-lb bag of LOW-P REPAIR MORTAR will yield approximately 0.7 ft^3. When extended with 50 lbs of 3/8" aggregate yields approximately 0.9 ft^3.

SHELF LIFE: LOW-P REPAIR MORTAR 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.

OVERVIEW

Highlights:

- Low Permeability: Less than 1000 coulombs
- Fast: Minimizes downtime; ready for traffic in 1 to 3 hours
- Durable: Non-metallic, no added chlorides, sulfate resistant, ASR resistant, and freeze-thaw resistant
- Ease of Use: Easy to place, high slump, non-segregating formula
- Corrosion Protection: Integral corrosion inhibitor to protect embedded metals

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

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

LOW-P™ REPAIR MORTAR

Rapid-Setting Repair Mortar for Low Permeability Applications

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C191 Mod.	
Initial set	20 – 25 minutes
Final set	30 – 40 minutes

Compressive Strength	
ASTM C109 Mod.: Neat	ASTM C39: Extended
3 hours 4000 psi (26.6 MPa)	3 hours 3500 psi (24.1 MPa)
24 hours 5000 psi (34.5 MPa)	24 hours 4500 psi (31.0 MPa)
7 days 6500 psi (44.8 MPa)	7 days 6000 psi (41.4 MPa)
28 days 7500 psi (51.7 MPa)	28 days 7000 psi (48.3 MPa)

Bond Strength, ASTM C882 per C928	
Neat	Extended
24 hours 200 psi (8.3 MPa)	24 hours 1500 psi (10.3 MPa)
7 days 1400 psi (9.7 MPa)	7 days 1700 psi (11.7 MPa)
28 days 1500 psi (10.3 MPa)	28 days 2100 psi (14.5 MPa)

Rapid Chloride Permeability, ASTM C1202	
28 days	< 1000 coulombs

Shrinkage, ASTM C157 per C928	
28 days	< 0.03%

Freeze-Thaw, ASTM C666 (Procedure A)	
300 cycles	Dynamic modulus: 111.9%

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.

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

RAPID SET® CEMENT

Rapid Hardening Hydraulic Cement

PRODUCT DATASHEET

DESCRIPTION: RAPID SET® CEMENT is a high-performance, rapid hardening hydraulic cement. Use RAPID SET CEMENT to create concretes, mortars, and grouts that achieve structural strength in one hour. Engineered for low shrinkage and superior resistance to chemical attack, Rapid Set Cement maximizes service life and minimizes maintenance.

USES: Use RAPID SET CEMENT to replace ordinary portland cement for projects where fast return to service, high strength, and increased durability are desired. Rapid Set cement-based materials are ideal for a diverse range of interior and exterior projects including highway pavements, bridges, runways, tunnels, tilt-up, precast, sidewalks, floors, and many other applications. For larger jobs, RAPID SET CEMENT mixtures may be batched using conventional ready mix or volumetric mixer equipment. Many state and local municipalities throughout the United States specify RAPID SET CEMENT in their concrete mix designs when speed and durability are important.

ENVIRONMENTAL ADVANTAGES: Use RAPID SET CEMENT to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 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 88 lb (40 kg) bag of RAPID SET CEMENT, 176 lb (79.8 kg) of sand, 176 lb (79.8 kg) of 1/4" to 3/4" (0.6 cm to 1.9 cm) stone and about 4 gallons (15.1 L) of potable water. For calculating volume, the specific gravity is 2.98 g/cm^3. Contact CTS technical support for additional assistance, if needed.

FOR 50-LB BAG: 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 RAPID SET CEMENT, 100 lb (45.4 kg) of sand, 100 lb (45.4 kg) of 1/4" to 3/4" (0.6 cm to 1.9 cm) stone and about 2.3 gallons (8.7 L) of potable water. For calculating volume, the specific gravity is 2.98 g/cm^3. Contact CTS technical support for additional assistance, if needed.

Place material quickly and strike off with a screed. Apply desired finish. Concrete modifier admixtures are available.

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 RAPID SET CEMENT concrete to a thoroughly saturated surface with no standing water.

CURING: Most materials made with RAPID SET CEMENT must be water cured. Begin curing after the material starts to harden and before the surface starts to lose its moist sheen. The objective of 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.

Alternative curing methods may be suitable in some applications. Methods include, but are not limited to, the use of surface applied curing compounds conforming to ASTM C309. The material formulator is responsible for the mix design and determining the appropriate curing method.

OVERVIEW

Highlights:
Advanced rapid hardening technology
Use to create fast-setting concrete, mortar and grout
Inherent sulfate resistance and low shrinkage
Ready for service in as little as 1 hour
Interior/exterior

Conforms to:
ASTM C1600 VRH

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 60	Maintenance of Grouting
03 01 70	Maintenance of Mass Concrete
03 31 00	Structural Concrete Cast in Place
03 33 00	Architectural Concrete - Cast-In-Place Concrete
03 37 13	Shotcrete
03 37 16	Pumped Concrete
03 37 19	Pneumatically Placed Concrete
03 47 00	Site-Cast Concrete
03 48 00	Precast Concrete Specialties
03 49 00	Glass-Fiber-Reinforced Concrete
03 53 19	Concrete Overlayment
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

RAPID SET® CEMENT Rapid Hardening Hydraulic Cement

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.

AVAILABILITY: RAPID SET® CEMENT is available in 50 lb and 88-lb (22.7 kg and 39.9 kg) bags, 2000 lb (907 kg) and 3000 lb (1361 kg)bulk bags, bulk tankers and rail.

SHELF LIFE: RAPID SET 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C191 Mod.	
Initial set	15 minutes
Final set	20 minutes

Compressive Strength, ASTM C109 Mod.	
1.5 hours	4500 psi (31.0 MPa)
3 hours	5500 psi (37.9 MPa)
24 hours	7000 psi (48.3 MPa)
28 days	8000 psi (55.2 MPa)

All data produced at 70°F (21°C)

ASPHALT REPAIR

DATASHEETS

- Asphalt Repair Mix
- Asphalt Resurfacer

ASPHALT REPAIR MIX

Fast-Setting, Cement-Based Pothole Fill and Repair Material

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® ASPHALT REPAIR MIX is a high-performance, fast-setting, multi-purpose, cementitious material with coarse aggregate for asphalt repair. ASPHALT REPAIR MIX has been specially formulated with a polymer-modified blend of Rapid Set Cement and additives designed to match the color of typical existing asphalt. Combine ASPHALT REPAIR MIX with water to produce a high-quality repair material that is ideal for pothole repairs. ASPHALT REPAIR MIX has superior adhesion to most substrates. ASPHALT REPAIR MIX has a working time of 15 minutes and achieves drive-on strength in 2 hours.

USES: Use ASPHALT REPAIR MIX for driveways, parking lots, roads, potholes and more.

ENVIRONMENTAL ADVANTAGES: Use Asphalt Repair Mix to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply ASPHALT REPAIR MIX in thicknesses from 2" (5 cm) to 24" (61 cm). For thinner sections, use Rapid Set® Asphalt Resurfacer.

SURFACE PREPARATION: For partial depth repairs, application surface must be clean, sound and free of any materials that may inhibit bond. Clean the repair area with a wire brush and remove dirt and debris with a stiff bristle broom. For maximum adhesion, it is recommended to pressure wash the surface thoroughly. Remove all standing water. For full depth repairs, remove damaged asphalt and loose debris, square-cut vertical sides, and saturate the surface with water prior to installing ASPHALT REPAIR MIX.

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. **ASPHALT REPAIR MIX may be mixed using 2.75 to 3.25 quarts (2.60 L to 3.08 L) of water per 50-lb (22.7 kg) bag.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add ASPHALT REPAIR MIX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes).

PLACEMENT: Organize work so that all personnel and equipment are ready before placement. Place and consolidate 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. ASPHALT REPAIR MIX may be troweled or floated. A smoother trowel may be used. To match existing asphalt textures, it is recommended to use a loop roller to apply the final finish. Do not install in layers; place in full-depth sections. Do not install with a tamping tool like traditional asphalt cold patch products. Do not install on frozen surfaces. ASPHALT REPAIR MIX may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

CURING: ASPHALT REPAIR MIX does not require water curing under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface for a minimum of 1 hour or until the product has achieved sufficient strength. Water curing may affect final color.

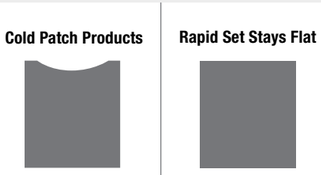
COLD WEATHER: Environmental and material temperatures below 70°F (21°C) may delay setting time and reduce the rate of strength gain. Lower temperatures will have a more pronounced effect. Thinner sections will be more significantly affected. To compensate for cold temperatures, keep material warm and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

WARM WEATHER: Environmental and material temperatures above 70°F (21°C) may

OVERVIEW

Highlights:
Superior adhesion to existing asphalt surfaces
Designed to match the color of typical existing asphalt
Ready to use for full depth repairs from 2" to 24"
Higher durability than conventional asphalt
Easy to apply: Just add water, mix and pour. No tamping needed
Stays flat: Little to no subsidence

Subsidence of Asphalt Repair Materials:



Tested in accordance with:
ASTM C143
ASTM C403

MasterFormat® 2020	
32 01 00	Operations and Maintenance of Exterior Improvements
32 01 17	Flexible Paving Repair

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

ASPHALT REPAIR MIX Fast-Setting, Cement-Based Pothole Fill and Repair Material

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 and use chilled mix water.

YIELD & PACKAGING: ASPHALT REPAIR MIX is available in a 50-lb (22.7 kg) bag. One 50-lb (22.7 kg) bag of ASPHALT REPAIR MIX will yield approximately 0.43 ft^3 (0.012 m^3).

SHELF LIFE: ASPHALT REPAIR MIX 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: ASPHALT REPAIR MIX is not recommended for recently poured or resealed asphalt (within 12 months). Reflective cracks may appear due to vibration, substrate flexure or existing cracks.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C403	
Initial set	85 minutes
Final set	100 minutes

ASPHALT RESURFACER

High-Performance, Cement-Based Repair Material for Asphalt

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® ASPHALT RESURFACER is a high-performance, fast-setting, multi-purpose, cementitious material for asphalt repair. ASPHALT RESURFACER has been specially formulated with a polymer-modified blend of Rapid Set® Cement and additives designed to match the color of typical existing asphalt. Combine ASPHALT RESURFACER with water to produce a high-quality repair material that is ideal for any asphalt repairs and resurfacing. ASPHALT RESURFACER has superior adhesion to most substrates. It has a working time of 20 minutes and achieves drive-on strength in 2 hours.

USES: Use ASPHALT RESURFACER for driveways, parking lots, roads, spall repairs, cracks, potholes and more.

ENVIRONMENTAL ADVANTAGES: Use ASPHALT RESURFACER to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply ASPHALT RESURFACER in thicknesses from 1/8" (0.3 cm) to 2" (5 cm). For thicker applications, use ASPHALT REPAIR MIX or extend ASPHALT RESURFACER up to 75% by weight with clean, coarse aggregate up to 3/4"(1.9 cm). Extended ASPHALT RESURFACER can be applied in thicknesses up to 24" (61 cm).

SURFACE PREPARATION: For repairs, application surface must be clean, sound and free from any materials that may inhibit bond such as dirt and loose debris. Roughen surface and remove all unsound material. For maximum adhesion, it is recommended to pressure wash the surface thoroughly. Remove all standing water prior to applying ASPHALT RESURFACER.

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. **ASPHALT RESURFACER may be mixed using 2 to 3 quarts (1.9 L to 2.8 L) of water per 25-lb (11.3 kg) box. Use up to 3 quarts (2.8 L) when extended with coarse aggregate. It may be mixed using 4 to 6 quarts (3.8 L to 5.7 L) of water per 50-lb (22.7 kg) bag. Use up to 6.0 quarts (5.7 L) when extended with coarse aggregate.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add ASPHALT RESURFACER. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes).

PLACEMENT: Organize work so that all personnel and equipment are ready before placement. Place quickly to allow for maximum finishing time. Do not wait for bleed water; apply final finish as soon as possible. ASPHALT RESURFACER may be troweled or floated. A smoother trowel may be used. To match existing asphalt textures, it is recommended to use a loop roller to apply the final finish or a broom to create a broom-finish. Do not install in layers; place in full-depth sections. Do not install with a tamping tool like traditional asphalt cold patch products. Do not install on frozen surfaces. ASPHALT RESURFACER may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

CURING: ASPHALT RESURFACER does not require water curing under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface for a minimum of 1 hour or until the product has achieved sufficient strength. Water curing may affect final color.

COLD WEATHER: Environmental and material temperatures below 70°F (21°C) may delay

OVERVIEW

Highlights:

- Superior adhesion to asphalt surfaces
- Designed to match the color of typical existing asphalt
- Higher durability than conventional asphalt
- Fast setting: Drive-on in 2 hours
- Easy to apply: Just add water, mix and place
- Extendable with coarse aggregate for thick applications

Tested in accordance with:

ASTM C266

MasterFormat® 2020

32 01 00	Operations and Maintenance of Exterior Improvement
32 01 17	Flexible Paving Repair
32 01 13	Flexible Paving Surface Treatment

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

ASPHALT RESURFACER High-Performance, Cement-Based Repair Material for Asphalt

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 and use heated mix water.

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 and use chilled mix water.

YIELD & PACKAGING: ASPHALT RESURFACER is available in a 25-lb (11.3 kg) box and a 50-lb (22.7 kg) bag. One 25-lb (11.3 kg) box of ASPHALT RESURFACER will yield approximately 0.29 ft^3 (0.008 m^3) or 28 ft^2 (2.6 m^2) at 1/8" (0.3 cm) average thickness. One 50-lb (22.7 kg) bag of ASPHALT RESURFACER will yield approximately 0.58 ft^3 (0.016 m^3) or 56 ft^2 (5.2 m^2) at 1/8" (0.3 cm) average thickness.

SHELF LIFE: ASPHALT RESURFACER 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: ASPHALT RESURFACER is not recommended for recently poured or resealed asphalt (within 12 months). Reflective cracks may appear due to vibration, substrate flexure or existing cracks.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C266	
Initial set	85 minutes
Final set	100 minutes

STUCCO

DATASHEETS

- Eisenwall®
- Stucco Mix
- Stucco Patch

EISENWALL®

Premium Cement For Exterior Plastering

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® EISENWALL® Cement is a premium blend of Rapid Set® Cement and high-performance additives for use in exterior plastering and stucco applications. EISENWALL is ideal where fast turnaround, high strength, superior durability, minimal shrinkage, and reduced cracking are desired. The appearance is similar to portland cement-based plaster and may be applied using like methods. EISENWALL carries a current ICC-ES Evaluation Report (ESR-2671).

USES: Use EISENWALL for installation over masonry, concrete, fiberboard, gypsum, wood or cement-based sheathing. EISENWALL may be used as the scratch and brown coats in conventional 3-coat applications, or as the base coat in one-coat applications.

ENVIRONMENTAL ADVANTAGES: Use EISENWALL to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply EISENWALL using traditional means and methods. EISENWALL can be applied from 3/8" to 2" (0.95 cm to 5.1 cm) in thickness. Apply by hand (trowel) or by machine. Projects using EISENWALL must follow conventional methods, comply with applicable building codes and ICC-ES Report ESR-2671. See CTS specification and application guidelines available at www.CTScement.com.

SURFACE PREPARATION: For repair projects, application surface must be clean, sound and free from any materials that may inhibit bond, such as oil, curing compound, acid, dirt and loose debris. Roughen surface and remove all unsound material. The repair surface must be thoroughly Saturated Surface Dry (SSD) with water.

MIXING: Rapid Set® EISENWALL can be mixed in a mortar mixer or with a drill-mounted mixer. To determine the correct mix proportions, refer to chart. A 3-to-1 sand to cement ratio is recommended.

PLACEMENT: Organize work so that all personnel and equipment are ready before placement. Apply and finish using traditional tools and techniques. The working time of EISENWALL is approximately 45 minutes at 70°F (21°C). Complete installation of mixed materials before stopping work. To extend working time, use Rapid Set® Eisenwall® SET Control retarding admixture or use cold mix water.

CURING: Water cure EISENWALL by misting the surface with clean water to maintain its wet sheen until the material is hard and cannot be easily scratched with a nail (minimum 90 minutes). Cold weather or extended setting times will increase the required curing time. The objective of water curing is 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 by using heated mix water. Rapid Set® EISENWALL® should not be applied if surface, material, or ambient temperature is below 45°F (7°C).

OVERVIEW

Highlights:

- Fast: Scratch, brown and apply color coat the same day
- Crack Resistant: High strength, low-shrink formula
- Efficient: Full thickness in a single application
- Easy To Use: Just add sand and water

Conforms to:

ASTM: C1328*, ESR-2671, UBC 25-1
State and Local Approvals

MasterFormat® 2016

03 37 13	Shotcrete
03 37 16	Pumped Concrete
03 37 19	Pneumatically Placed Concrete
09 24 23	Cement Stucco

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

EISENWALL® Premium Cement For Exterior Plastering

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 or use chilled mix water. The use of Eisenwall® SET Control retarding admixture will help offset the effects of high temperatures.

YIELD & PACKAGING: Rapid Set® EISENWALL Cement is available in 88-lb (40-kg) polyethylene lined bags. One 88-lb (40-kg) bag will yield approximately 5 yd^2 (4.18 m^2) at 3/4" (1.9 cm) thickness using the recommended mix design.

SHELF LIFE: EISENWALL 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.

APPROVED APPLICATOR: Contact 800-929-3030 or ApprovedAP@CTScement.com to become an approved applicator.

USER RESPONSIBILITY: Before using CTS products, read current technical data sheets, bulletins, product labels and safety data sheets 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, within one year from date of sale, will replace material proven defective or refund purchase price thereof, and such replacement or refund 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

TYPICAL PHYSICAL DATA

Compressive Strength, ASTM C109 Mod.	
6 hours	1500 psi (10.3 MPa)
24 hours	2500 psi (17.2 MPa)
28 days	3500 psi (24.1 MPa)

Set Time, ASTM C266 Mod.	
Initial set*	75 minutes

All data produced at 70°F (21°C)
*This product is not a portland cement and may have less than 90 minutes set time

Mixing Proportions

Material	Small Jobs	Large Jobs
Eisenwall cement	1 shovel	1 88-lb (40-kg) bag
Plaster sand	3 shovels	18-24 shovels, about 264 lb (120 kg)
Water	3 quarts	4-6 gallons (15-23 L)

Note: For above, use shovel size number 2. Water demand will vary depending on the moisture in the sand. Use enough water to achieve the desired working consistency. Mix approximately 3 to 5 minutes. CAUTION: DO NOT RETEMPER OR OVER-MIX. Do not add portland cement, lime, or any other admixtures unless approved by CTS Cement.

STUCCO MIX

Premium Pre-Mixed Exterior Stucco and Plaster

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® STUCCO MIX is a premium blend of Rapid Set® Cement, quality plaster sand, and high performance additives for use in exterior plastering and stucco applications. STUCCO MIX is ideal where fast turnaround, high strength, superior durability, minimal shrinkage, and reduced cracking are desired. The appearance is similar to portland cement-based plaster and may be applied using like methods. Just add water. STUCCO MIX carries a current ICC-ES Evaluation Report (ESR-2671).

USES: Use STUCCO MIX for installation over masonry, concrete, fiberboard, gypsum, wood or cement-based sheathing. STUCCO MIX may be used as the scratch and brown coats in conventional 3-coat applications, or as the base coat in one-coat applications.

ENVIRONMENTAL ADVANTAGES: Use STUCCO MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply STUCCO MIX using traditional means and methods. STUCCO MIX can be applied from 3/8" to 2" (1.0 cm to 5.1 cm) in thickness. Apply by hand (trowel) or by machine. Projects using STUCCO MIX must follow conventional methods, comply with applicable building codes and ICC-ES Report ESR-2671. See CTS specification and application guidelines available at www.CTScement.com.

SURFACE PREPARATION: For repair projects, application surface must be clean, sound and free from any materials that may inhibit bond, such as oil, curing compound, acid, dirt and loose debris. Roughen surface and remove all unsound material. The repair surface must be thoroughly Saturated Surface Dry (SSD) with water.

MIXING: STUCCO MIX can be mixed in a mortar mixer or with a drill mounted mixer. Use 2.0 to 3.5 quarts (1.9 L to 3.3 L) of water per 50 lb (22.7 kg) bag. Place the desired quantity of mix water into the mixing container. While the mixer is running, add STUCCO MIX. Mix for 3 to 5 minutes, or until a uniform, lump-free consistency is achieved. **CAUTION: DO NOT RETEMPER OR OVER-MIX. DO NOT ADD PORTLAND CEMENT, LIME, OR ANY OTHER ADMIXTURES UNLESS APPROVED BY CTS CEMENT.**

PLACEMENT: Organize work so that all personnel and equipment are ready before placement. Apply and finish using traditional tools and techniques. The working time of STUCCO MIX is approximately 45 minutes at 70°F (21°C). Complete installation of mixed materials before stopping work. To extend working time, use Rapid Set® SET Control retarding admixture or use cold mix water. The second coat must applied as soon as the first coat has attained sufficient rigidity to accept the mechanical force of application without damage.

CURING: Water cure STUCCO MIX by misting the surface with clean water to maintain its wet sheen until the material is hard and cannot be easily scratched with a nail (minimum 90 minutes). Cold weather or extended setting times will increase the required curing time. The objective of water curing is to maintain a continuously wet surface until the product has achieved sufficient strength.

COATING: Color coat may be applied after the completion of water curing Stucco Mix per the color coat manufacturer. Under dry ambient conditions, water based coatings such

OVERVIEW

Highlights:

- Fast: Ready for color coat in 1 hour after moist curing
- Crack Resistant: High strength, low-shrink formula
- Efficient: Full thickness in a single application
- Easy to Use: Just add water
- Save Time: Scratch, brown and apply color coat the same day

Conforms to:

ASTM C1328*, ESR-2671, UBC 25-1

MasterFormat® 2016

09 24 23 Cement Stucco

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

STUCCO MIX Premium Pre-Mixed Exterior Stucco and Plaster

as latex paint can be applied after the product is hardened and dry which usually takes 4 hours. Solvent based and impermeable coatings such as oil based paint and epoxy can be applied in 16 hours.

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: One 50 lb (22.7 kg) bag of STUCCO MIX will cover approximately 7.0 ft² (0.65 m²) at 3/4" (1.9 cm) thickness. Yields 0.45 ft³ (0.013 m³) per 50 lb (22.7 kg) bag.

SHELF LIFE: STUCCO MIX 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.

APPROVED APPLICATOR FOR PROFESSIONALS: Contact 800-929-3030 or ApprovedAP@CTScement.com to become an approved applicator.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Set Time, ASTM C266 Mod.	
Initial set	75 minutes

Compressive Strength, ASTM C109 Mod.	
6 hours	1000 psi (6.9 MPa)
24 hours	1800 psi (12.4 MPa)
28 days	2900 psi (20.0 MPa)

*This product is not a portland cement and may have less than 90 minutes set time

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

STUCCO PATCH

Premium, Fast-Setting Stucco Repair Material

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® STUCCO PATCH is a premium, fast-setting stucco repair material, formulated with Rapid Set hydraulic cement, advanced polymers and high quality aggregates. Mix STUCCO PATCH with water to produce a rich, easy to apply mixture with excellent bonding characteristics. STUCCO PATCH can be applied full depth in a single application and textured to match a variety of stucco surfaces. STUCCO PATCH has a 20-minute working time and can be primed and painted after approximately 2 hours. The advanced technology in STUCCO PATCH provides a high-strength and low-shrinkage repair.

USES: Use STUCCO PATCH for the repair of cracks, holes and voids in stucco surfaces. Excellent for use in window and door installations. STUCCO PATCH can be used for exterior and interior stucco surfaces. Most primers, paints, and topcoats are compatible with STUCCO PATCH.

ENVIRONMENTAL ADVANTAGES: Use STUCCO PATCH tto reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply STUCCO PATCH in a single application, thicknesses from 1/8" to 1" (3 mm to 25 mm).

SURFACE PREPARATION: For repairs, application surface must be clean, sound and free from any materials that may inhibit bond, such as oil, curing compound, acid, dirt and loose debris. Roughen surface and remove all unsound material. Open cracks to minimum 1/4" (6 mm) width. In hot, dry, or windy environmental conditions, pre-wetting of the surface to be patched may be necessary.

COLOR: Off-White. The final color of STUCCO PATCH and other cementitious materials may vary due to application techniques and environmental conditions.

MIXING: STUCCO PATCH can be mixed by hand or power-driven mechanical mixer. Organize work so that all personnel and equipment are in place before mixing. **Use 1 part clean potable water to 4 parts STUCCO PATCH or 2 quarts (1.9 L) per 25-lb (11.3-kg) bag.** Add STUCCO PATCH into the mix water while mixing. Mix to achieve a uniform, lump-free consistency. Clean mixing bucket and tools between batches. Do not retemper.

INSTALLATION: Apply STUCCO PATCH with a trowel or putty knife. Place quickly to allow for maximum finishing time. Use a trowel, float or sponge to match the texture with the surrounding area. STUCCO PATCH may be primed and painted after approximately 2 hours.

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 and/or use heated mix water.

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 and/or use chilled mix water. The use of SET Control retarding admixture will help offset

OVERVIEW

Highlights:

- Fast: Paint the same day
- Advanced formula: Great workability. Safe for paint. Maintains paint gloss and color
- Crack resistant: Apply up to 1" thick in a single application. Excellent bond
- Water resistant: Polymer modified for durability in wet environments
- Textured: #16-20 grit sand

Tested in accordance with:

ASTM C109

MasterFormat® 2016

09 24 23 Cement Stucco

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

STUCCO PATCH Premium, Fast-Setting Stucco Repair Material

the effects of high temperatures.

CURING: STUCCO PATCH does not require water curing or curing compound under moderate conditions at 70°F (21°C). In dry, windy or hot conditions, mist with water to maintain a continuously wet surface until the product has achieved sufficient strength.

YIELD & PACKAGING: STUCCO PATCH is available in 50-lb (22.7-kg), 25-lb (11.3-kg) and 10-lb (4.5-kg) sizes. One 50-lb (22.7-kg) bag of STUCCO PATCH will yield approximately 0.4 ft^3 (0.01 m^3).One 25-lb (11.3-kg) bag or box of STUCCO PATCH will yield approximately 0.20 ft^3 (0.006 m^3). One 10-lb (4.5-kg)a box of STUCCO PATCH will yield approximately 0.1 ft^3 (0.003 m^3).

SHELF LIFE: STUCCO PATCH 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Compressive Strength, ASTM C109 Mod.	
24 hours	2500 psi (17.2 MPa)

All data produced at 70°F (21°C)

SHOTCRETE & FILL

DATASHEETS

- Flowable Fill
- FPP Concrete Mix
- HTF Shotcrete
- Low-P™ Shotcrete

FLOWABLE FILL

High Performance Backfill

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® FLOWABLE FILL is an easy-to-produce, high performance subbase for fill applications requiring fast turnaround. Flowable Fill is a mixture of Rapid Set hydraulic cement, aggregate, and water designed for soil replacement or reinforcement. Flowable Fill is a self-compacting material suitable in applications requiring Controlled Low Strength Material (CLSM) or Controlled Density Fill (CDF). FLOWABLE FILL sets in 45 minutes allowing early load application.

USES: Use FLOWABLE FILL for filling utility cuts, pipe bedding, runway and pavement subbase, and backfilling foundations. FLOWABLE FILL is ideal for airport, highway, industrial, and other civil applications.

ENVIRONMENTAL ADVANTAGES: Use FLOWABLE FILL to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Pour in place typically delivered to the jobsite in a concrete mixing truck or batched onsite by a volumetric mixer.

PREPARATION: Organize work so that all personnel and equipment are in place before mixing.

COMPOSITION: Rapid Set® FLOWABLE FILL mix designs normally contain 80 to 100 lbs of cement per cubic yard (48 kg to 60 kg per cubic meter). More cement may be added to increase strength.

A sand mix is best suited for use in trenches where high flow and future diggability are important.

SAND MIX:	Rapid Set Cement	l00 lbs (45.4 kg)
	Sand (ssd)	2900 lbs (1315.4 kg)
	Water	480 lbs (217.7 kg)

A rock mix is suitable for structural applications such as pavement base and foundation backfill.

ROCK MIX:	Rapid Set Cement	88 lbs (40 kg)
	Coarse Aggregate	1800 lbs (816.4 kg)
	Sand (ssd)	1700 lbs (771.1 kg)
	Water	400 lbs (181.4 kg)

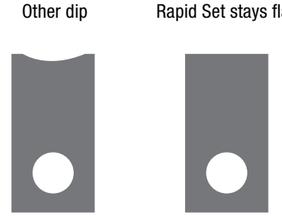
MIXING: The use of a power-driven mechanical mixer, such as a mortar mixer or a mobile volumetric concrete mixer, is recommended. Mix and place material quickly.

OVERVIEW

Highlights:

- Fast: Hardens quickly for rapid foot traffic access and pavement overlay
- Controlled: Easily removed by conventional digging tools
- Effective: Little to no subsidence
- Easy to Use: Pour into place. No compaction needed

Subsidence of Backfill Materials:



Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

FLOWABLE FILL High Performance Backfill

PLACEMENT: Rapid Set® FLOWABLE FILL may be placed using traditional construction methods. Organize work so that all personnel and equipment are ready before placement.

Do not install on frozen surfaces. To extend working time, use cold mix water or a CTS approved admixture. FLOWABLE FILL may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C). No curing is necessary.

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.

AVAILABILITY: Rapid Set® Cement is available in 50-lb and 88-lb (23-kg and 40-kg) bags, 2000-lb super sack and bulk tankers.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Typical Compressive Strength (ASTM D4832) of Rapid Set® Flowable Fill*	
1 hour	3 psi (0.02 MPa)
3 hours	10 psi (0.07 MPa)
24 hours	20 psi (0.14 MPa)
1 year	75 psi (0.52 MPa)

*Humidity, ambient and water temperature will vary your results. All data produced at 70°F (21°C).

USGBC and related logo is a trademark owned by the U.S. Green Building Council and is used by permission.

FPP CONCRETE MIX

Form, Pour & Pumpable Concrete Mix

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® FPP CONCRETE MIX is a high-performance, form and pour, pumpable, self-consolidating concrete repair material. Durable in wet environments, FPP CONCRETE MIX is a blend of Rapid Set hydraulic cement, high performance additives and quality aggregates. FPP CONCRETE MIX is non-metallic and no chlorides are added. Mix FPP CONCRETE MIX with water to produce a workable, pumpable concrete material that is ideal where high durability and low shrinkage are desired. Integral Rapid Set® Corrosion Inhibitor is already added to increase protection of embedded reinforcement.

USES: Use FPP CONCRETE MIX for general and structural concrete repair, construction of pavements, formed work, footings, balconies, tunnels, roadways, elevated concrete slabs, parking decks and industrial floors.

ENVIRONMENTAL ADVANTAGES: Use FPP CONCRETE MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Apply FPP CONCRETE MIX in thicknesses from 2" to 24" (5 cm to 61 cm).

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. If applicable, apply FPP CONCRETE MIX 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 required. Organize work so that all personnel and equipment are in place before mixing. Use clean, potable water. **FPP CONCRETE MIX may be mixed using 3.25 to 3.75 quarts (3.08 L to 3.55 L) of water per 60-lb (27.2-kg) bag. Use less water to reduce slump for sloped applications and to achieve higher strengths. Do not exceed 3.75 quarts (3.55 L) of water per bag.** Place the desired quantity of mix water into the mixing container. While the mixer is running, add FPP CONCRETE MIX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

PLACEMENT: FPP CONCRETE MIX may be placed using traditional construction methods. When placing with a concrete pump, pump continuously and clean out equipment immediately after completion. Organize work so that all personnel and equipment are ready before placement. Place, consolidate and screed quickly to allow for maximum finishing time. FPP CONCRETE MIX is a self-consolidating concrete, so traditional methods of consolidation such as vibration are not necessary. The mix may appear to have reached a plastic consistency within the first 30 minutes, but rodding or stirring will return the mix to a fluid and highly workable consistency. Do not wait for bleed water; apply final finish as soon as possible. FPP CONCRETE MIX may be troweled, floated or broom finished. On flatwork, do not install in layers. 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. FPP CONCRETE MIX may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C). Under dry conditions, water based coatings such as paint can be applied in 6 hours. Solvent based and impermeable coatings such as oil based paint and epoxy can be applied in 16 hours. Follow the coating manufacturer's recommendations for surface condition.

OVERVIEW

Highlights:

- Self-Consolidating: Surrounds reinforcement and fills formwork
- Pumpable: Extended working time for maximum flow life
- Fast: Structural strength in 4 hours
- Polymer Modified
- Low Permeability: Resistant to chloride ion penetration
- Integral Corrosion Inhibitor: Corrosion resistance for embedded reinforcement
- Durable: Formulated for long life in critical applications
- Structural: For repair and new construction
- Multi-Purpose: General and structural concrete repair, formed work, and more

MasterFormat® 2016

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 40	Maintenance of Precast Concrete
03 01 70	Maintenance of Mass Concrete
03 33 00	Architectural Concrete - Cast-In-Place Concrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

FPP CONCRETE MIX Form, Pour & Pumpable Concrete Mix

CURING: Placements must be protected from loss of moisture until material has reached structural strength. For exposed surfaces, apply a curing compound that conforms to ASTM C309, or water cure until structural strength is achieved. For formed work, keep forms in place to protect from moisture loss. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required.

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: Rapid Set® FPP CONCRETE MIX is available in 60-lb (27.2-kg) bags. One 60-lb (27.2-kg) bag of FPP CONCRETE MIX will yield approximately 0.48 ft^3 (0.014 m^3).

SHELF LIFE: FPP CONCRETE MIX 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 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, within one year from date of sale, will replace material proven defective or refund purchase price thereof, and such replacement or refund 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

TYPICAL PHYSICAL DATA

Slump Spread, ASTM C1611	
Slump spread	27 in to 33 in
Spread after 30 min	>15 in

Compressive Strength, ASTM C39	
4 hours	2500 psi (17.2 MPa)
24 hours	3500 psi (20.7 MPa)
7 days	6000 psi (41.4 MPa)
28 days	6500 psi (44.8 MPa)

Data obtained using 3.75 quarts at 70°F (21°C). Results may vary depending on jobsite and environmental conditions.

HTF SHOTCRETE

Fast-Setting, Fiber-Reinforced Dry Process Shotcrete

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® HTF SHOTCRETE is a fast-setting, fiber-reinforced shotcrete formulation based on advanced CSA cement technology. HTF SHOTCRETE produces shotcrete mixtures with unparalleled performance and ease of use without the need for an accelerator. Finished HTF SHOTCRETE exhibits exceptional durability for mining and tunneling environments.

APPLICATIONS: HTF SHOTCRETE is ideal for tunnel interiors, mine ribs, highwalls, and other vertical and overhead shotcrete applications where fast strength gain and long-term durability are desired. HTF SHOTCRETE sets fast without an accelerator. HTF SHOTCRETE can be applied anywhere conventional dry processed shotcrete is used.

ADVANTAGES:

- **CONVENIENT:** Single-component, pre-blended formula
- **FAST:** Sets quickly to minimize dropout and gain strength with no accelerator, reducing cycle times
- **SAFE:** Hydraulic cement based formula contains 0 g/L of VOCs
- **EFFICIENCY:** Reduced rebound saves material and minimizes clean-up
- **HIGH SULFATE RESISTANCE**
- **GREEN:** Rapid Set cement is manufactured using recycled materials, smaller carbon footprint than conventional shotcrete

ENVIRONMENTAL ADVANTAGES: Use HTF SHOTCRETE to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

FIELD TESTING: Conduct field test panels at the jobsite using the prepared bonding surface and the HTF SHOTCRETE to determine actual field performance and suitability for intended use.

SURFACE PREPARATION: Concrete bonding surfaces should be clean, sound, and free from any materials that may inhibit bond such as oil, asphalt, curing compounds, acids, dirt and loose debris. Surface should be prepared in accordance with ICRI Guidelines for surface preparation and project specifications.

Before placement of HTF SHOTCRETE, the repair surface should be thoroughly saturated with water just before placement.

OVERVIEW

Highlights:

High Early Strength: Long term performance

For fast and durable shotcrete applications

MasterFormat® 2016

03 37 13 Shotcrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

HTF SHOTCRETE Fast-Setting, Fiber-Reinforced Dry Process Shotcrete

PACKAGING: HTF SHOTCRETE is packaged in 3000-lb woven polypropylene bulk bags.

SHELF LIFE: HTF SHOTCRETE 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 Rapid Set products, read current technical data sheet, bulletins, product label and material safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and material safety data sheet 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Yield	Approximately 0.8 cu. yd. per 3000-lb bulk bag
Set time	30 minutes
Working time	15 minutes

Compressive Strength, ASTM C1604, C39	
1 hour*	1000 psi (6.89 MPa)
3 hours	3000 psi (20.7 MPa)
24 hours	4500 psi (31.0 MPa)
28 days	8000 psi (55.2 MPa)

*After final set
All data produced at 72°F (22°C)

LOW-P™ SHOTCRETE

Low Permeability Dry Process Shotcrete

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® LOW-P™ SHOTCRETE is a low permeability, corrosion resistant, low-alkali, fast-setting shotcrete formulation based on polymer-modified cement technology. LOW-P SHOTCRETE produces shotcrete mixtures with unparalleled performance and ease of use without the need for an accelerator. Finished LOW-P SHOTCRETE exhibits exceptional durability in harsh freeze-thaw environments.

APPLICATION: LOW-P SHOTCRETE is ideal for tunnel interiors, underneath bridge decks, and other vertical and overhead shotcrete applications where low chloride ion permeability, corrosion resistance, and fast strength gain are desired. LOW-P SHOTCRETE sets fast without an accelerator. LOW-P SHOTCRETE can be applied anywhere conventional shotcrete is used.

ADVANTAGES:

- Low Permeability: Improved resistance to attack from chlorides and de-icing salts
- Convenient: Single-component, pre-blended formula
- Fast: Sets quickly to minimize dropout and gain strength with no accelerator
- Safe: Hydraulic cement based formula contains 0 g/L of VOCs
- Excellent freeze-thaw resistance
- Provides corrosion protection
- High sulfate resistance
- Green: Contains up to 10% recycled materials, smaller carbon footprint than conventional shotcrete

ENVIRONMENTAL ADVANTAGES: Use LOW-P SHOTCRETE to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

FIELD TESTING: Conduct field test panels at the jobsite using the prepared bonding surface and the Low-P Shotcrete to determine actual field performance and suitability for intended use.

SURFACE PREPARATION: Concrete bonding surfaces must be clean, sound, and free from any materials that may inhibit bond such as oil, asphalt, curing compounds, acids, dirt and loose debris. Surface should be prepared in accordance with ICRI Guidelines for surface preparation and project specifications.

Before placement of LOW-P SHOTCRETE, the repair surface should be thoroughly saturated with water just before placement.

OVERVIEW

Highlights:

- Low permeability
- Corrosion protection
- High early strength for fast and durable shotcrete applications

MasterFormat® 2016

03 37 13 Shotcrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

LOW-P™ SHOTCRETE Low Permeability Dry Process Shotcrete

PACKAGING: LOW-P SHOTCRETE is packaged in 55-lb. 3-ply polyethylene lined bags, 50 per pallet.

SHELF LIFE: LOW-P SHOTCRETE 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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Compressive Strength, ASTM C1604, C39	
1 hour*	1500 psi (10.3 MPa)
3 hours	2500 psi (17.2 MPa)
24 hours	4000 psi (27.5 MPa)
28 days	5000 psi (34.5 MPa)

Approx.	
Yield	0.5 cu.ft. per bag
Set time	30 minutes
Working time	15 minutes

Hang Thickness	
Up to 10 inches	Varies with water content

Slant-Shear Bond Strength, ASTM C882	
28 days	750 psi (5.17 MPa)

Rapid Chloride Ion Penetration, ASTM C1202 / AASHTO T-277	
28 days	<500 Coulombs

Freeze-Thaw Resistance, ASTM C666	
Durability factor	> 90 after 300 cycles

*After final set
All data produced at 72°F (22°C)

SHRINKAGE COMPENSATING CEMENT

KOMPONENT
TECHNICAL GUIDE

DATASHEETS

- Type K
- Komponent®
- System-K™

Shrinkage-Compensating Cement Technology

ADVANCING CEMENT TECHNOLOGY

KOMPONENT

At CTS Cement, shrinkage-compensating cement and concrete materials are at the core of what we do.

HISTORY

Type K shrinkage-compensating cement technology is what our company was founded over 60 years ago.

SHRINKAGE-COMPENSATING CEMENT has a long and established history, renowned for its ability to overcome drying shrinkage cracking in concrete and other cementitious materials. For design and engineering teams, it offers proven performance and peace of mind. For owners, property managers and facility management teams, it is the material of choice for its ability to prevent costly deterioration and common maintenance issues related to drying shrinkage.

At CTS Cement, shrinkage-compensating cement and concrete materials are at the core of what we do. Type K shrinkage-compensating cement technology is what our company was founded over 60 years ago, with technology developed at the University of California, Berkeley, by Professor Alexander Klein and Edward K. Rice, P.E., our founder.

Edward K. Rice, P.E. – Founder, FACI

Komponent® technology eliminates detrimental tensile stresses that lead to shrinkage cracking

Minimize Cracking

KOMPONENT® TECHNOLOGY offers an effective and economical way to minimize cracking caused by drying shrinkage. Komponent® technology eliminates detrimental tensile stresses that lead to shrinkage cracking and is used to prevent drying shrinkage and edge curling in slabs and toppings. It also helps eliminate repair and maintenance costs, and addresses costly challenges related to restraint-to-shortening in post-tensioned structures.

PRODUCTS

Komponent®

is an expansive mineral additive. It is blended with portland cement to create Type K shrinkage-compensating cement that is used to make Type K shrinkage-compensating concrete, low shrinkage concrete, and non-shrink grout materials. Komponent® can be added at the production plant or on the job site in proportions that achieve the specified amount of shrinkage compensation.

System-K™

is a fiber reinforced, shrinkage-compensated concrete system for creating Type K Shrinkage-Compensating Concrete floor slabs with minimal or no reinforcing steel. It includes engineered 1/4" synthetic monofilament K-Fiber™ and Komponent. These short, synthetic fibers provide sufficient restraint and improve the durability of the finished concrete. System-K offers a cost effective alternative to typical steel reinforced concrete floor slabs.

Type K

is a pre-blended cement consisting of 15% Komponent and 85% portland cement. Type K Cement is used to make ASTM C845 Type K shrinkage-compensating concrete, low shrinkage concrete and non-shrink grout materials.

These versatile materials provide solutions for concrete and other concrete materials in a wide range of applications, from new construction and renovation to maintenance and repair.

Industry
Standards

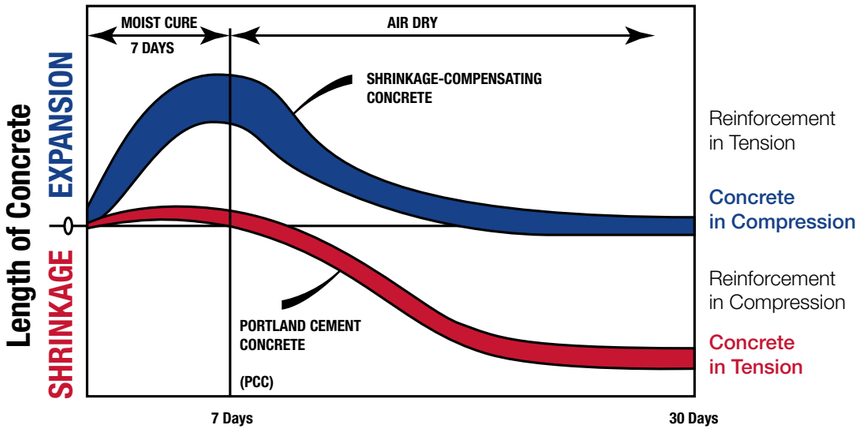
Industry standards, test methods, and specifications used to define the performance requirements and parameters of use for shrinkage-compensating concrete, non-shrink, and low-shrinkage cementitious materials include:

ASTM C845	Standard Specification for Expansive Hydraulic Cement
ASTM C806	Standard Test Method for Restrained Expansion of Expansive Cement Mortar
ASTM C878	Standard Test Method for Restrained Expansion of Shrinkage-Compensating Concrete
ASTM C1107	Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (Non-Shrink)
ASTM C596	Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement
ASTM C157*	Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
ACI 223	Guide for the Use of Shrinkage-Compensating Concrete
CRD-C 621	U.S. Army Corps of Engineers Specification for Non-Shrink Grout
Other	Department of the Army, Corps of Engineers Manual EM1110-2-2000, Engineering and Design Standard Practice for Concrete

*Used for low shrinkage concrete mix designs.

HOW IT WORKS

Shrinkage-Compensating Cements develop compressive and tensile stresses early, during hydration. The resulting expansive strains are relieved upon drying shrinkage.



ACI 223 Standard Practice for the use of Shrinkage Compensating Concrete

ACI 223 Standard Practice for the use of Shrinkage Compensating Concrete

The C_4A_3S in Komponent® combines with free lime in the concrete to form ettringite. The ettringite formation produces controlled expansion of the concrete during the first seven days of wet curing following placement. This initial expansion compensates for the shrinkage of concrete during drying.

Drying shrinkage cracks occur in conventional concrete slabs when movement caused by shrinkage is resisted by an external restraint, such as friction with the subgrade. It produces tensile stress that literally "tears" the concrete apart because concrete is weak in tension.

Komponent® Shrinkage-Compensating Cement technology prevents drying shrinkage cracking by counteracting tensile stress. Shrinkage-compensating concrete is placed with some form of restraint, usually in the form of reinforcing bars or post-tensioning tendons. Concrete expansion puts the reinforcement into tension. The tensioned reinforcement, like a stretched rubber band holding together a stack of papers, puts the concrete into compression, where it is the strongest. The initial expansion of shrinkage-compensating concrete minus subsequent drying shrinkage yields a net shrinkage usually close to zero.

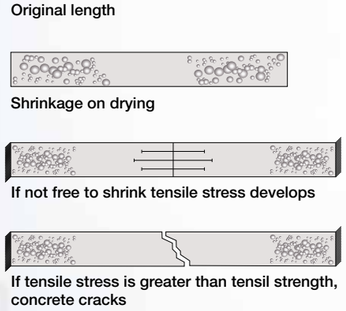
Does it work like a Shrinkage-Reducing Admixture?

NO.

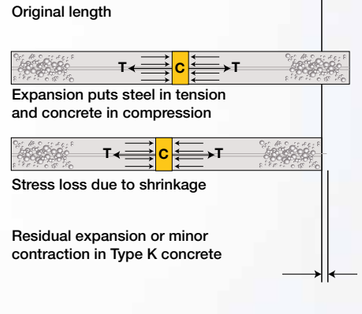
Shrinkage-reducing admixtures (SRAs) are designed to delay shrinkage by reducing the surface tension of pore water. This decreases capillary stress and shrinkage induced during drying. Over time, the surface tension effects diminish and the excess free water is released, resulting in delayed drying shrinkage.

Komponent cement technology chemically binds the water molecules within the ettringite structure. Once chemically bound, they cannot be separated and dimensional stability of the concrete is achieved.

SRAs are designed to delay shrinkage.



Over time, their effects diminish and



shrinkage cracking and curling will occur.

ACI 223, Section 1.2

"…expansion will induce tension in the reinforcement and compression in the concrete. On subsequent drying the shrinkage merely relieves the expansive strains…"

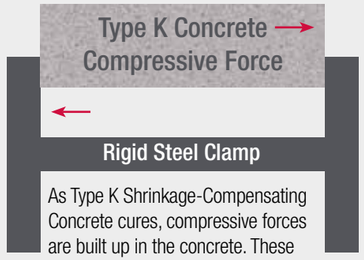
Type K Shrinkage-Compensating Cement Technology

Shrinkage-compensating cement is engineered to create controlled expansive forces which create controlled compressive stresses that keep concrete in compression throughout its service life. Though concrete may crack or fail from other causes, such as structural overloading, settlement, or plastic shrinkage, Type K Shrinkage-Compensating Cement can eliminate the most common type of cracking – drying shrinkage cracking.

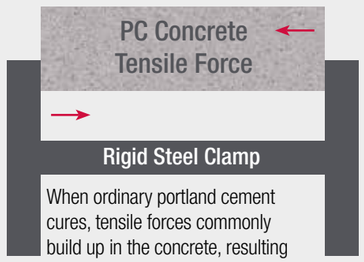
Shrinkage-compensation is similar to placing a concrete bar in a very strong clamp, in which the length of the bar fits tightly within the perimeter limits of the clamp. When the bar is heated, the bar attempts to expand but is unable due to the restraint of the clamp. The bar is now in compression.

Drying shrinkage in concrete is similar to cooling the concrete bar. As the bar cools, the compression is reduced until the bar reaches its original temperature and length. Further cooling of the concrete bar would result in additional shortening, creating a gap between the ends of the bar and the clamp. In concrete, shortening often results in drying shrinkage cracking.

With shrinkage-compensating cement, expansion is caused by the creation of expansive ettringite crystals during hydration which, when restrained, places the concrete in compression. By reducing the detrimental tensile stresses that lead to shrinkage cracking, shrinkage-compensating cement overcomes the challenges drying shrinkage presents and produces a more durable concrete solution with lower life-cycle costs.



As Type K Shrinkage-Compensating Concrete cures, compressive forces are built up in the concrete. These compressive forces make a more durable, crack-free concrete possible.



When ordinary portland cement cures, tensile forces commonly build up in the concrete, resulting in cracking, curling, and shrinking.

TYPE K SHRINKAGE-COMPENSATING CONCRETE is based on expansive, hydraulic, calcium sulfoaluminate (CSA) cement technology. It is a modified derivative of portland cement developed in the 1950s by Professor Alexander Klein and named in his honor as Klein Cement, with CSA known as the Klien Compound. It is now known as Type K Cement (ASTM C845).

Type K Cement is engineered to achieve a higher quality cement that overcomes the shortcomings of traditional portland cement, namely excessive shrinkage, susceptibility to sulfate attack, and destructive reactions with certain aggregates. Type K Cement is used in all types of structures and concrete elements to counteract drying-shrinkage cracking.

Type K Shrinkage-Compensating Concrete is produced by using approximately 15% Komponent and 85% portland cement by weight of cement

Its primary uses are in post-tensioned structures, chemically pre-stressed concrete applications, slab on grade applications, concrete containment, and any concrete use where fewer joints are desired.

Tensile & Compressive Stresses

In shrinkage-compensating concrete, the cement paste expands during the first week after it is cast, which slightly compresses the concrete. Later, as the concrete dries, it shrinks back to its original size reducing the compression in the concrete. By keeping the concrete in mild compression, and keeping tensile stresses within the concrete lower than its tensile strength, drying shrinkage cracks are prevented. Expansion against restraint causes compressive stress in the concrete that compensates for tensile forces in the concrete due to drying shrinkage.

Restraint

Generally, required restraint for shrinkage-compensating concrete is provided by reinforcing steel, or in the case of System-K floor slabs, non-metallic K-Fibers™.

Steel reinforcement (approximately 0.15%) or two (2) pounds of System-K Fibers per cubic yard are sufficient to provide restraint for Type K concrete. There is no upper limit to the amount of restraint to make Type K Shrinkage-Compensating Concrete work. "Infinite" (100%) restraint, such as casting a slab against an adjacent slab, will induce a compression in concrete of about 100 psi, which reduces drying shrinkage to approximately zero.

Mix Designs

Type K Shrinkage-Compensating Concrete is produced by using approximately 15% Komponent and 85% portland cement by weight of cement. The amount of expansive energy in the concrete is determined by the amount of expansive compound in the cementitious material. The amount of Komponent used in the concrete mix is generally about 60 to 120 pounds per cubic yard. This is determined by design and job requirements. Non-shrink grouts can also be produced using Komponent.

Komponent is sometimes added to high shrinkage aggregate mixes to achieve the same shrinkage level as low shrinkage aggregates. The use of lower levels of Komponent (less than 15%) produces the effects of a shrinkage reducing admixture but does not produce the engineered performance of Type K shrinkage-compensating concrete. Stress risers in the concrete, such as splicing of the reinforcing bars, re-entrant corners, etc. will sometimes overcome the effects of shrinkage-compensation and small cracks can occur at these locations.

Recommended reinforcement detailing and mix designs are provided in the CTS Type K Shrinkage-Compensating Concrete Reference Guide.

Placement & Curing

Type K Shrinkage-Compensating Concrete can be installed using traditional methods and tools. Super flat floor profiles may be obtained using laser screeds and proper finishing techniques.

For best results, Type K Shrinkage-Compensating Concrete must be properly cured, ideally wet cured, for 7 days. This ensures full hydration and designed expansion of the Type K Cement compounds.

Due to the absence of bleed water, finishing of the Type K concrete can begin earlier than the finishing of a traditional concrete slab, saving valuable time on-site.

Joint Spacing

Type K Shrinkage-Compensating Concrete can be installed in large placements, up to 25,000 square feet, without control joints. Crack-free floor slabs have been constructed with Type K Shrinkage-Compensating Concrete with joint spacing up to 150 feet. Significant savings is realized both during installation and in long-term maintenance costs by eliminating saw cut joints and sealing. Curling of floor slabs at joints is also significantly reduced or eliminated, greatly reducing corner breaks and spall repairs.

Engineered to achieve a higher quality cement

ADVANTAGES

Type K Shrinkage-Compensating Cement provides many advantages that make it an attractive solution for the Integrated Project Team

1. **ELIMINATE** pour strips
2. **ELIMINATE** restraint-to-shortening challenges in post-tensioned applications
3. **ELIMINATE** edge curling, spalls and corner breaks
4. **REDUCE** support column movement and shear wall stresses in post-tensioned structures and reduce reinforcing steel
5. **REDUCE** construction joints by 90-95%
6. **REDUCE** waterstops and minimize leakage and seepage points in containment structures
7. **IMPROVE** installation efficiencies by minimizing or eliminating placement and treatment of control joints
8. **IMPROVE** the aesthetics of polished and architectural concrete designs
9. **INCREASE** length between expansion joints (up to 3:1 length to width ratio; longer, narrower design spans can also be achieved)
10. **INCREASE** durability and lower permeability for maximum service life

Common Applications

Endless possibilities

Type K Shrinkage-Compensating Cement technology can be used in any application where regular portland cement concrete is used, including but not limited to reinforced and post tensioned structural slabs, slabs on grade, walls, post-tensioned structures, toppings, grouts and pre-cast elements. It is also used wherever drying shrinkage cracks are not desirable.

Common applications include:

WAREHOUSES
Distribution Centers, Automated Fulfillment Centers, Data Storage

PARKING STRUCTURES
Above and Below Ground

STRUCTURAL CONCRETE

HANGARS
Runways, Taxiways

BRIDGES & VIADUCTS

MULTI-USE BUILDINGS
Retail, Hospitality, Recreational, Business, Residential

MANUFACTURING
Food, Pharmaceutical, Heavy Equipment, Industrial

MASS ELEMENTS

WATER/WASTE CONTAINMENT
Treatment, Storage, Containment

TILT-UP & PRE-CAST
Pre-Formed, Pre-Stressed

RECREATIONAL
Ice Rinks, Tennis Courts, Skate Parks, Swimming Pools

MARINE ENVIRONMENTS
Piers, Wharves, Seawalls

ROOF DECKS
Monolithic, Formed

STRUCTURAL GROUT

And more...

Case Studies

Notable projects

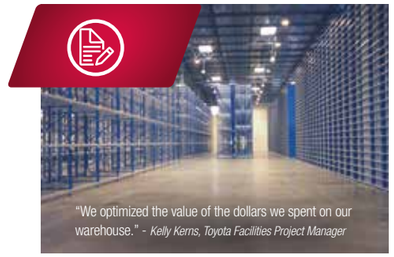
Special K

Durable flooring solutions free of joints, cracks and seams are a top priority in food manufacturing environments. Preventing spaces where bacteria and other microbes can grow is paramount to maintaining hygiene standards and cleanliness in these facilities. Due to the reduced-joint and joint-free options provided by Type K Shrinkage-Compensating Concrete and its proven performance in all types of food manufacturing, processing, cold storage and distribution facilities.

Amy's Kitchen chose Type K concrete floors for a 180,000 sq. ft. facility in Medford, OR to maximize the benefits of Type K Shrinkage-Compensating Concrete. By minimizing joints in the slab, reducing joint placement and treatment costs, reducing shrinkage reinforcement requirements, and speeding time to completion, savings were realized during construction. By preventing shrinkage cracking, edge curling, spalling, joint raveling, and minimizing on-going joint maintenance, significant savings are realized annually in lower maintenance costs. The exceptional outcome, despite the complex sloping and drainage designs and stringent concrete requirements, prompted Don Skundrick, Operations Vice President at LTM Inc., to voice his satisfaction: "I've been in this business over 40 years and I've never seen anything so crack-free."

Efficient Production

Warehouse and distribution center managers face daily challenges to efficiently utilize space and reduce costs. Efficiency in material handling and minimizing maintenance, repair and downtime costs assist in maximizing product throughput and enhancing productivity.



Toyota Motor Corporation chose Type K Shrinkage-Compensating Concrete for its 760,000 sq. ft. distribution and warehousing center located in Ontario, CA to do just that. Floor repairs in various other Toyota facilities due to joint damaged by forklifts and other transport equipment averaged $10,000 annually. Type K allowed the floor slabs to be designed with 90% fewer control joints than traditional slabs and 30-40% greater abrasion resistance, delivering savings in reduced installation costs, floor and joint maintenance, and equipment maintenance. The dimensional stability of Type K enabled super-flat floor designs at 6" and 8" thicknesses, with a surface deviation of less than 1/10" in 10 feet that remain within exceptional super-flat tolerances year-to-year.

Essential Containment

Controlling cracks is always a top priority in concrete structures, but when the structure is a containment tank, it is critical. ASTM C845 Type K Shrinkage-Compensating Concrete was specified by consulting engineering firm Crawford Murphy & Tilly (CMT) for the Springfield Wastewater Treatment Facility Expansion in Springfield, IL to mitigate shrinkage-related cracks, provide improved sulfate resistance, and higher abrasion resistance. Type K also permitted extended joint spacing, larger placements, and consolidated pour sequencing, which helped reduce both the schedule and construction costs. Fewer expansion joints saves construction time, reduces the use of costly joint materials/sealants, eliminates leakage points, and minimizes maintenance over the life of the structure.

The exceptional performance of this project resulted in two additional Springfield treatment plant projects specifying the use of Type K Shrinkage-Compensating Concrete to ensure maximum value and long-term performance of the City's vital wastewater infrastructure.

MasterFormat®

Guideline
Specifications

Shrinkage-compensating concrete and grouting master specification guidelines are available on the CTS Cement website. Or, contact a member of the Komponent® Engineering Team at (800) 929.3030 or via email at info@CTScement.com for assistance.

APPLICABLE SPECIFICATION SECTIONS

03 30 00	Cast-in-place concrete
03 31 19	Shrinkage-compensating structural concrete
03 33 00	Architectural concrete
03 35 43	Polished concrete
03 38 00	Post-tensioned concrete
03 40 00	Pre-cast concrete
03 47 00	Site-cast concrete
03 50 00	Cast decks and underlayments
03 53 00	Concrete toppings
03 60 00	Grouting
03 70 00	Mass concrete
32 13 00	Prestressed concrete paving
32 13 16	Decorative concrete paving
33 36 00	Wastewater storage tanks, concrete

Komponent® Shrinkage-Compensating Concrete is also listed in the BSD SpecLink-E program, Section 03 30 00 – Cast-In-Place Concrete.

Qualified Contractor Program

CTS Cement is proud to offer a distinguished partnership opportunity to concrete contractors seeking high performance solutions that add value to your portfolio of products, distinguish your brand image, and help you grow your business.

CTS is committed to providing high quality products, service and support to Owners, Developers and Facilities Teams that rely on long-term performance and low maintenance concrete solutions. We are proud to partner with industry associates that share our commitment to excellence. Our Qualified Contractor Program supports this commitment by ensuring experienced concrete contractors have completed a comprehensive education program designed to equip them with the information necessary to install high-quality Komponent® Shrinkage-Compensating Concrete solutions. There are no franchise fees or training fees to participate. A commitment to excellence and quality is all that is required.

KOMPONENT
QUALIFIED
CONTRACTOR

Contractor Benefits

Komponent® Shrinkage-Compensating Cement solutions allow contractors to provide unparalleled performance for concreting and grouting applications. As more stringent requirements for higher performance specifications and more cost effective concreting solutions continue to increase, Komponent® products provide proven performance that help you meet shrinkage-compensating and low shrinkage project requirements.

INNOVATIVE PRODUCT LINE
Komponent® products offer shrinkage-compensating and low shrinkage cement solutions for all types of concreting projects...from floor and topping slabs to bridge decks, pavements to parking structures, containment structures to soil stabilization and grouting. This advanced cement technology offers the most versatile, high-performance solution for quality concrete designs and high-performance non-shrink grouts.

CONTINUING EDUCATION PROGRAM
CTS Cement's extensive continuing education program allows Engineers, Designers, Architects, and other industry professionals to earn the professional development hours (PDH) required to meet state licensing requirements. This program opens doors of opportunity to present the advantages Komponent® offers to Owners and Design teams seeking to maximize the value of their investment and minimize lifecycle costs.

PROJECT LEADS
CTS Cement's Engineering Sales Team works with Owners, Engineers, Federal Agencies, General Contractors and Design/Build teams to develop project leads and specifications that create new project opportunities.

TECHNICAL SUPPORT
Technical Teams work with our partners to assist with specifications, detailing, product selection, mix designs, on-site training, and field support. We partner WITH you to ensure success!

CTS is proud to partner with contractors that share our commitment to excellence. Our Qualified Contractor Program supports this commitment by ensuring you and your team have a comprehensive understanding of Komponent® technology and are well equipped to consistently achieve successful installations.

No franchise fees. No royalties. Just a commitment to quality, teamwork and best practices.

HOW TO GET STARTED
Contact a member of the CTS Engineering Team for more information at info@ctscement.com or 800-929-3030.

Complementary Products

For concrete structures and other concrete elements in need of repair or maintenance, CTS Cement offers a complete line of high-performance, CSA cement-based Rapid Set® products used for a wide range of concrete maintenance and repair solutions. Rapid Set's products offer speed and maximum durability without sacrificing performance.

Contact Us

WHETHER YOU'RE BUILDING a new structure, engineering infrastructure, or renovating, restoring or repairing existing concrete elements, CTS Cement's Komponent technology can provide a wide variety of high-performance concrete and concrete repair solutions.

Contact us for assistance with product selection, specifications, samples, mix designs, and other project support needs. CTS Cement's experienced team of engineers, material scientists, technical experts and sales representatives are available to support your next project.

Advancing Cement Technology

Contact us for assistance with product selection, specifications, samples, mix designs, and other project support needs.

CTS CEMENT MANUFACTURING CORPORATION

12442 Knott Street
Garden Grove, CA 92841
www.CTScement.com
info@CTScement.com
800-929-3030

KOMPONENT

KOMPONENT®

Shrinkage-Compensating Cement Additive

KOMPONENT

PRODUCT DATASHEET

DESCRIPTION: KOMPONENT® is a calcium sulfoaluminate (CSA) cement based additive used to create shrinkage-compensating concrete, low shrinkage concrete, and non-shrink grouts. It is engineered to prevent drying shrinkage cracking by creating controlled expansion during placement and cure that overcomes the inherent shrinkage of the portland cement and aggregates. KOMPONENT is combined with regional portland cement to produce an ASTM C845 Type K shrinkage-compensating cement. Type K cement made with KOMPONENT reduces permeability, provides up to 60% increased abrasion resistance, prevents slab curling, improves sulfate resistance, and helps maintain dimensional stability. Long-term performance is optimized in traditional cast-in-place and post-tensioned designs. Design and construction are simplified by maximizing placement sizes, reducing mobilizations, and minimizing or eliminating control joints, waterstops and pour strips. Thinner slabs and walls are also viable.

USES: Use KOMPONENT to make Type K and System-K™ shrinkage-compensating concrete, low shrinkage concrete and non-shrink grouts. KOMPONENT shrinkage-compensating cement additive is ideal for use in industrial slabs, concrete containment structures, parking structures, bridge decks, topping slabs, composite decks, post-tensioned and chemically prestressed structures, architectural concrete, polished concrete, mass elements, underground structures, and other cast-in-place concrete applications. Use to eliminate shrinkage cracking and dominant joints. Use where preventing curling and warping, improving abrasion resistance, and improving aesthetics and structural behavior are desirable.

ENVIRONMENTAL ADVANTAGES: Use KOMPONENT to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Use KOMPONENT to replace approximately 10-17% of total cementitious content in the mix design to create shrinkage-compensating cement concrete or grout. Actual mix designs vary depending on application, regional portland cement characteristics, regional aggregate characteristics, supplementary cementitious materials, admixtures, and concrete performance requirements. Shrinkage-compensated materials made with KOMPONENT are produced by conventional concrete and grout production equipment and installation practices. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Do not place concrete if ambient temperatures exceed 90°F (32°C). Ambient conditions must be a minimum of 40°F (4°C) and rising at time of placement. Subgrade temperature must not be less than 40°F (4°C) at time of placement. Concrete temperature at placement must not be less than 55°F (13°C). Protect concrete from freezing temperatures for 7 days after placement. Do not place concrete that is 90 minutes or older measured from the time of initial production. Refer to the KOMPONENT Shrinkage-Compensating Concrete Reference Guide for design details and installation considerations. Contact your CTS Engineering representative for project support.

BATCHING & MIXING: KOMPONENT is added at the batch plant or on-site using common bulk cement equipment and incorporation methods. When using bagged units for smaller projects, alternate portable concrete batching solutions are available. Contact CTS Cement for information. Mix designs use a lab qualified dosage of KOMPONENT to replace an equivalent weight of total cementitious content per cubic yard of concrete. Bulk KOMPONENT must be weighed before the portland cement to ensure proper dosage. For System-K™ Microfiber Reinforced slab designs, K-Fibers™ are added at a rate of one (1) pre-packaged 2.2 lb (1 kg) unit per cubic yard. For mix design guidelines and batching and mixing instructions, refer to the Shrinkage-Compensating Concrete Reference Guide for details.

WATER/CEMENT RATIO: Due to KOMPONENT's efficient consumption of mix water during hydration, water/cement ratios between 0.40 and 0.55 are recommended. Ensure thorough mixing and dispersion throughout the load after all components have been added into the truck. Concrete production must comply with ASTM C94/94M except where otherwise stated in CTS Cement's published literature. For lower water/cement ratio designs, contact your CTS Engineering representative for project support.

CURING: For general applications, wet curing is required. Refer to the Shrinkage-Compensating Concrete Reference Guide and ACI 223 for additional details.

COLD WEATHER: Environmental and material temperatures below 70°F (21°C) may delay

OVERVIEW

Highlights:

- Prevent drying shrinkage cracking and curling
- Reduce control joints by 90-95%
- Improve abrasion resistance up to 60%
- Increase durability and lower permeability
- Improve sulfate resistance
- Increase placement sizes and minimize mobilizations
- Eliminate pour/delay strips
- Minimize long-term stress loss and creep in post-tensioned designs

Conforms to:

- ASTM C845 - Type K
- Used to create Type K Shrinkage-Compensating Concrete (ACI 223)

Approved:

- State (DOT) and local provisions

Tested in accordance with:

- ASTM: C845, C806, C878

MasterFormat® 2016

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayment
03 01 60	Maintenance of Grouting
03 01 70	Maintenance of Mass Concrete
03 05 00	Concrete Bonding Agents, Admixtures and Adhesives
03 31 00	Cast-in-Place Concrete
03 31 19	Shrinkage-Compensating Structural Concrete
03 33 00	Architectural Concrete - Cast-In-Place Concrete
03 37 13	Shotcrete
03 37 16	Pumped Concrete
03 37 19	Pneumatically Placed Concrete
03 47 00	Site-Cast Concrete
03 48 00	Precast Concrete Specialties
03 49 00	Glass-Fiber-Reinforced Concrete
03 53 19	Concrete Overlayment
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting
03 64 00	Injection Grouting
03 70 00	Mass Concrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St., Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

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. When average high and low temperature is expected to fall below 40°F (4°C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M). Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

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.

PACKAGING & AVAILABILITY: KOMPONENT is available in 50 lb (22.7 kg) polyethylene-lined bags and 2000 lb (907 kg) bulk bags. It is also available in bulk tanker trucks and railcars.

SHELF LIFE: KOMPONENT bagged units have 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. Sealed bulk storage containers extend the shelf life of KOMPONENT up to 2 years when stored properly and protected from adverse environmental conditions.

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.

TECHNICAL SUPPORT: CTS Cement Manufacturing Corp. provides contractors, engineers, and project owners with professional technical services on any KOMPONENT application. For detailed information on use and applications of KOMPONENT, refer to the CTS Shrinkage-Compensating Concrete Reference Guide or contact your CTS Engineering representative for project support at 1-800-929-3030.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

Type K Shrinkage-Compensating concrete, low shrinkage concrete, and non-shrink grout can be made using KOMPONENT® mixed with local portland cement. Listed below are mix design examples using KOMPONENT. For assistance developing project specific mix designs or very low permeability mixes, contact CTS Cement's Engineering or Technical Service team. All mixes should be tested in a qualified lab using methods designed for shrinkage-compensating cements to ensure suitability for the required application.

TYPE K CONCRETE made with KOMPONENT	
Portland Cement	464 lb (210.5 kg)
KOMPONENT	100 lb (45.4 kg)
Fine Aggregate ASTM C33	1214 lb (550.7 kg)
Coarse Aggregate ASTM C33	1935 lb (877.7 kg)
Water	282 lb (127.9 kg)
Hydration Stabilizer ASTM C494	Minimum 2oz/ctw (0.06kg/ctw)
Water Reducer ASTM C494	17 oz (0.48 kg)
Performance	
Slump (+/-1.5") ASTM C143	5.75 in (146mm)
Expansion, 7 days ASTM C878	0.041%
Compressive Strength, 7 days ASTM C39	3283 psi (22.6 MPa)
Compressive Strength, 28 days ASTM C39	5120 psi (35.3 MPa)
Specific Gravity, KOMPONENT	2.87 g/cm³

NON-SHRINK GROUT made with KOMPONENT	
Portland Cement	846 lb (383.7 kg)
KOMPONENT	100 lb (45.4 kg)
Fine Aggregate ASTM C33	2640 lb (1197.5 kg)
Water	434 lb (196.9 kg)
Hydration Stabilizer ASTM C494	Minimum 2oz/ctw (0.06kg/ctw)
Water Reducer ASTM C494	24 oz (0.68 kg)
Performance	
Expansion, 7 days ASTM C878	0.045%
Compressive Strength, 7 days ASTM C109 Mod.	4800 psi (33.1 MPa)
Compressive Strength, 28 days ASTM C109 Mod.	7250 psi (49.6 MPa)
Specific Gravity, KOMPONENT	2.87 g/cm³

TYPE K CEMENT

Pre-Blended Shrinkage-Compensating Cement

KOMPONENT™

PRODUCT DATASHEET

DESCRIPTION: TYPE K CEMENT (ASTM C845) is a pre-blended hydraulic cement consisting of Komponent® cement additive and Type II portland cement used to create shrinkage-compensating concrete, low shrinkage concrete, and non-shrink grouts. Pre-blended units ensure consistency in cement content mix-to-mix and offer an ideal solution for projects where consistent quality is critical. TYPE K CEMENT is engineered to prevent drying shrinkage cracking by creating controlled expansion during placement and cure that overcomes the inherent shrinkage of portland cement concrete. TYPE K CEMENT reduces permeability, provides up to 60% increased abrasion resistance, prevents slab curling, improves sulfate resistance, and helps maintain dimensional stability. Long-term performance is optimized in traditional cast-in-place and post-tension designs. Design and construction are simplified by maximizing placement sizes, reducing mobilizations, and minimizing or eliminating control joints, waterstops and pour strips. Thinner walls and slabs are also viable.

USES: TYPE K CEMENT is used to create Type K and System-K™ Shrinkage-Compensating Concrete, low shrinkage concrete and non-shrink grouts. It is ideal for use in industrial slabs-on-grade, concrete containment structures, parking structures, bridge decks, topping slabs, composite decks, post-tensioned and chemically pre-stressed structures, architectural concrete, polished concrete, mass elements, underground structures, and other cast-in-place concrete applications. Use in any concrete or grouting application where eliminating shrinkage cracking, reducing control joints, preventing curling and warping, improving sulfate resistance, improving aesthetics, or improving structural behavior is desirable.

ENVIRONMENTAL ADVANTAGES: Use TYPE K CEMENT to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Shrinkage-compensating concrete and other concrete materials made with TYPE K CEMENT are produced by conventional production equipment, incorporation methods, and installation practices. Actual mix designs vary depending on application, regional aggregate characteristics, supplementary cementitious materials, admixtures, and concrete performance requirements. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Do not place concrete if ambient temperatures exceed 90°F (32°C). Ambient conditions must be a minimum of 40°F (4°C) and rising at time of placement. Subgrade temperature must not be less than 40°F (4°C) at time of placement. Concrete temperature at placement must not be less than 55°F (13°C). Protect concrete from freezing temperatures for 7 days after placement. Do not place concrete that is 90 minutes or older measured from the time of initial production. Refer to the Shrinkage-Compensating Concrete Reference Guide for design details and installation considerations. Contact your CTS Engineering representative for project support at 1-800-929-3030.

BATCHING & MIXING: TYPE K CEMENT is added at the concrete batch plant. For mix design guidelines and batching and mixing instructions, refer to the Shrinkage-Compensating Concrete Reference Guide for details.

WATER/CEMENT RATIO: Due to the efficient consumption of mix water in TYPE K CEMENT, water/cement ratios between 0.40 and 0.55 are recommended. Ensure thorough mixing and dispersion throughout the load after all components have been added in the truck. Concrete production must comply with ASTM C94/94M except where otherwise stated in CTS Cement's published literature. For lower water/cement ratio designs, contact your CTS Engineering representative for project support at 1-800-929-3030.

CURING: For general applications, wet cure is required. Refer to the Shrinkage-Compensating Concrete Reference Guide and ACI 223 for additional details.

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. When average high and low temperature is expected to fall below 40°F (4.4°C) for three successive days, maintain delivered concrete

OVERVIEW

Highlights:

- Prevent drying shrinkage cracking and curling
- Reduce control joints by 90-95%
- Increase abrasion resistance up to 60%
- Increase durability and lower permeability
- Improve sulfate resistance
- Protect against corrosion and deterioration
- Increase pour sizes and minimize mobilizations
- Eliminate pour/delay strips
- Minimize long-term stress loss and creep in post-tension designs

Conforms to:

- ASTM C845 - TYPE K
- Use to create Type K Shrinkage-Compensating Concrete (ACI 223)

Tested in accordance with:

ASTM: C845, C806, C878

MasterFormat® 2016

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayment
03 01 60	Maintenance of Grouting
03 01 70	Maintenance of Mass Concrete
03 31 00	Cast-in-Place Concrete
03 31 19	Shrinkage-Compensating Structural Concrete
03 33 00	Architectural Concrete - Cast-in-Place Concrete
03 37 13	Shotcrete
03 37 16	Pumped Concrete
03 37 19	Pneumatically Placed Concrete
03 47 00	Site-Cast Concrete
03 48 00	Precast Concrete Specialties
03 49 00	Glass-Fiber-Reinforced Concrete
03 53 19	Concrete Overlayment
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting
03 64 00	Injection Grouting
03 70 00	Mass Concrete

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

TYPE K CEMENT Pre-Blended Shrinkage-Compensating Cement

mixture temperature within the temperature range required by ACI 301 (ACI 301M). Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

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.

PACKAGING & AVAILABILITY: TYPE K CEMENT is available in 94 lb (42.7 kg) polyethylene-lined bags and 2000 lb (909 kg) bulk bags. It is also available in bulk tanker trucks and railcars.

SHELF LIFE: TYPE K CEMENT bagged units have 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. Sealed bulk storage containers extend the shelf life of TYPE K CEMENT up to 2 years when stored properly protected from adverse environmental conditions.

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.

TECHNICAL SUPPORT: CTS Cement provides contractors, engineers, and project owners with in-house and field technical services on any TYPE K CEMENT application. For detailed information on use and applications of TYPE K CEMENT and shrinkage-compensating cement technology, refer to CTS Cement's Shrinkage-Compensating Concrete Reference Guide.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

TYPE K Shrinkage-Compensating Concrete, low shrinkage concrete, and non-shrink grout can be made using pre-blended TYPE K CEMENT or using Komponent® cement additive mixed on site with local portland cement. Listed below are mix design examples using pre-blended TYPE K CEMENT. For mix designs using Komponent cement additive, refer to the Komponent data sheet. For assistance developing project specific mix designs or very low permeability mixes, contact CTS Cement's Engineering or Technical Service team. All mixes should be tested in a lab using methods designed for shrinkage-compensating cements to ensure suitability for the required application.

TYPE K CONCRETE made with TYPE K CEMENT	
TYPE K CEMENT	560 lb (254 kg)
Fine aggregate ASTM C33	1800 lb (816.5 kg)
Coarse Aggregate ASTM C33	1095 lb (496.7 kg)
Water	309 lb (140.2 kg)
Hydration Stabilizer ASTM C494	Minimum 2oz/ctw (0.06kg/ctw)
Water Reducer ASTM C494	24 oz (0.68 kg)
Performance	
Slump (+/- 1.5") ASTM C143	5.75 in (146mm)
Expansion, 7 days ASTM C878	0.045%
Compressive Strength, 7 days ASTM C39	3400 psi (23.4 MPa)
Compressive Strength, 28 days ASTM C39	4500 psi (31.0 MPa)
Specific Gravity, TYPE K CEMENT	3.13 g/cm³

NON-SHRINK GROUT made with TYPE K CEMENT	
TYPE K CEMENT	946 lb (429 kg)
Fine Aggregate ASTM C33	2640 lb (1197.5 kg)
Water	434 lb (196.9 kg)
Hydration Stabilizer ASTM C494	Minimum 2oz/ctw (0.06kg/ctw)
Water Reducer ASTM C494	24 oz (0.68 kg)
Performance	
Expansion, 7 days ASTM C878	0.045%
Compressive Strength, 7 days ASTM C109 Mod.	4800 psi (33.1 MPa)
Compressive Strength, 28 days ASTM C109 Mod.	7250 psi (49.6 MPa)
Specific Gravity, TYPE K CEMENT	3.13 g/cm³

SYSTEM-K™

Microfiber Reinforced Shrinkage-Compensating Cement Concrete

KOMPONENT™

PRODUCT DATASHEET

DESCRIPTION: SYSTEM-K™ is a microfiber reinforced option for creating high-performance shrinkage-compensating concrete for non-structural slabs-on-grade, topping slabs, composite decks, and low shrinkage concrete slab-on-grade designs. It incorporates 1/4" synthetic K-Fiber™ and Komponent® that are combined with locally sourced portland cement. These short, synthetic K-Fibers provide sufficient shrinkage and temperature restraint and improve the overall durability of the finished concrete. SYSTEM-K offers a cost effective alternative to traditionally reinforced slabs by allowing you to significantly reduce traditional steel reinforcement requirements. Use only perimeter steel and re-entrant corner reinforcement in conjunction with K-Fiber and Komponent to create an economical, high-performance SYSTEM-K shrinkage-compensating slab. SYSTEM-K prevents drying shrinkage cracking, reduces permeability, provides up to 60% increased abrasion resistance, prevents slab curling, spalling and corner breaks, and helps maintain dimensional stability, long-term floor flatness and floor levelness. Design and construction are simplified by increasing placement sizes, reducing mobilizations, and minimizing control joints by up to 90%. Thinner slabs are also viable. SYSTEM-K contributes to sulfate resistance for placements where elevated sulfate conditions exist.

USES: SYSTEM-K™ Microfiber Reinforced Shrinkage-Compensating Concrete is ideal for commercial and industrial slabs-on-grade like warehouses, distribution centers, manufacturing and processing facilities, architectural and polished concrete designs, and many other applications where durability, dimensional stability, minimal or no control joints, and elimination of shrinkage cracking and slab curling is desirable. Synthetic K-Fibers provide shrinkage and temperature restraint and allow significant cost savings when compared with common steel reinforcement options.

ENVIRONMENTAL ADVANTAGES: Use SYSTEM-K Microfiber Reinforced Shrinkage-Compensating Cement to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your CTS representative for EPD, LEED values and other sustainability information.

APPLICATION: Use SYSTEM-K Microfiber Reinforced Shrinkage-Compensating Cement to produce shrinkage-compensating concrete, topping slabs, composite decks, and low-shrink concrete mixes. Actual mix designs vary depending on application, regional portland cement characteristics, regional aggregate characteristics, supplementary cementitious materials, admixtures, and concrete performance requirements. Shrinkage-compensating concrete and other concrete materials made with SYSTEM-K are produced by conventional production equipment and installation practices. Provisions for perimeter reinforcement, re-entrant corner and penetration reinforcement must be made to ensure best results. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Do not place concrete if ambient temperatures exceed 90°F (32°C). Ambient conditions must be a minimum of 40°F (4°C) and rising at time of placement. Subgrade temperature must not be less than 40°F (4°C) at time of placement. Concrete temperature at placement must not be less than 55°F (13°C). Protect concrete from freezing temperatures for 7 days after placement. Do not place concrete that is 90 minutes or older measured from the time of initial production. Refer to the Shrinkage-Compensating Concrete Reference Guide for design details and installation considerations. Contact your CTS Engineering representative for project support at 1-800-929-3030.

BATCHING & MIXING: SYSTEM-K is blended at the concrete batch plant using common bulk cement equipment and incorporation methods. When using bagged units for smaller projects, alternate portable concrete batching solutions are available. Contact CTS Cement for information. Mix designs use a lab qualified dosage of Komponent to replace an equivalent weight of total cementitious content per cubic yard of concrete. Bulk Komponent should be weighed before the portland cement to ensure proper dosage. K-Fibers are added at a rate of one (1) pre-packaged 2.2 lb (1 kg) unit per cubic yard. They disperse easily and will not produce "hairy" concrete. For mix design guidelines and batching and mixing instructions, refer to the Shrinkage-Compensating Concrete Reference Guide for details.

WATER/CEMENT RATIO: Due to Komponent's efficient consumption of mix water during hydration, water/cement ratios between 0.40 and 0.55 are recommended. Ensure thorough mixing and dispersion throughout the load after all components have been added into the truck. Concrete production must comply with ASTM C94/94M except where otherwise stated in CTS Cement's published literature. For lower water/cement ratio designs, contact your CTS Engineering representative for project support at 1-800-929-3030.

CURING: For general applications, wet cure is required. For complete production, batching, mixing and curing instructions, refer to the CTS Shrinkage-Compensating Concrete Reference Guide and ACI 223 for additional details.

OVERVIEW

Highlights:

- Prevent drying shrinkage cracking
- Reduce control joints up to 90%
- Increase abrasion resistance up to 60%
- Increase durability and lower permeability
- Improve sulfate resistance
- Protect against corrosion and deterioration
- Increase placement sizes and minimize mobilizations
- Prevent slab curling and maintain FF/FL

Conforms to:

ASTM C845 - Type K

Used to create Type K Shrinkage-Compensating Concrete (ACI 223)

MasterFormat® 2016

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayment
03 31 00	Cast-in-Place Concrete
03 31 19	Shrinkage-Compensating Non-Structural Concrete
03 33 00	Architectural Concrete - Cast-in-Place Concrete
03 37 13	Shotcrete
03 37 16	Pumped Concrete
03 37 19	Pneumatically Placed Concrete
03 47 00	Site-Cast Concrete
03 48 00	Precast Concrete Specialties
03 53 19	Concrete Overlayment
03 61 00	Cementitious Grouting
03 62 13	Non-Metallic Non-Shrink Grouting

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

SYSTEM-K™ Microfiber Reinforced Shrinkage-Compensating Cement Concrete

COLD WEATHER: Environmental and material temperatures below 70ºF (21ºC) 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. When average high and low temperature is expected to fall below 40ºF (4.4ºC) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M). Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

WARM WEATHER: Environmental and material temperatures above 70ºF (21ºC) 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.

PACKAGING & AVAILABILITY: Komponent Shrinkage-Compensating Cement is available in 50 lb (22.7 kg) polyethylene-lined bags and 2000 lb (907 kg) bulk bags. It is also available in bulk tanker trucks and railcars. K-Fibers are provided separately in pre-packaged, 2.2 lb (1 kg) dissolvable bags.

SHELF LIFE: Komponent bagged units used in SYSTEM-K Microfiber Reinforced Shrinkage-Compensating Cement have 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. Sealed bulk storage containers extend the shelf life of Komponent up to 2 years when stored properly and protected from adverse environmental conditions. K-Fibers have a shelf life of 3 years from the date of manufacture when stored properly, in a dry location, protected from moisture, out of direct sunlight, unopened 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.

TECHNICAL SUPPORT: CTS Cement provides contractors, engineers, and project owners with in-house and field technical services on any SYSTEM-K application. For detailed information on use and applications of shrinkage-compensating cement technology, refer to CTS Cement's Shrinkage-Compensating Concrete Reference Guide and contact your CTS Engineering representative for project support at 1-800-929-3030.

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**
CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

TYPICAL PHYSICAL DATA

SYSTEM-K™ Microfiber Reinforced Shrinkage-Compensating Concrete is made using Komponent® with K-Fibers™ batched with local portland cement.

Listed below are mix design examples using SYSTEM-K. For assistance developing project specific mix designs or very low permeability mixes, contact CTS Cement's Engineering or Technical Service team.

All mixes should be tested in a lab using methods designed for shrinkage-compensating cements to ensure suitability for the required application.

SYSTEM-K CONCRETE	
Portland Cement	464 lb (210.5 kg)
Komponent	100 lb (45.4 kg)
K-Fiber	2.2 lbs (1.0 kg)
Fine Aggregate ASTM C33	1214 lb (550.7 kg)
Coarse Aggregate ASTM C33	1935 lb (877.7 kg)
Water	282 lb (127.9 kg)
Hydration Stabilizer ASTM C494	Minimum 2oz/ctw (0.06kg/ctw)
Water Reducer ASTM C494	24 oz (0.68 kg)
PERFORMANCE	
Slump (+/- 1.5") ASTM C143	5.75 in (146mm)
Expansion, 7 days ASTM C878	0.041%
Compressive Strength, 7 days ASTM C39	3283 psi (22.6 MPa)
Compressive Strength, 28 days ASTM C39	5120 psi (35.3 MPa)

CHEMICAL ANCHORS & ADHESIVES

DATASHEETS

- Fast Anchoring & Repair Adhesive
- Ultra-Fast Anchoring Adhesive

FAST ANCHORING & REPAIR ADHESIVE

Multi-Purpose Two-Component Structural Epoxy

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® FAST ANCHORING & REPAIR ADHESIVE is a two-component, rigid structural epoxy anchoring repair adhesive designed to develop a strong, durable bond to concrete, masonry, and dissimilar building materials. The high-performance mechanical bond strength and pull-out strength make it suitable for use in a wide range of general construction, repair and maintenance projects.

USES: Use FAST ANCHORING & REPAIR ADHESIVE on properly prepared concrete and masonry substrates. It has a high chemical resistance for use in environments such as swimming pools with chlorine or near salt water. It is ideal for anchoring bolts, dowels, rebar, and wall ties to concrete, concrete blocks, stone, and other masonry substrates. Use as a mortar to fill holes, divets, pop-outs, and non-moving joints/cracks on concrete and masonry. This anchor and repair material is not intended for use as a cosmetic or decorative product. The resin may cause staining in certain materials.

SURFACE PREPARATION: Ensure the substrate is clean, sound and free of bond inhibitors, such as grease, oil, mold, coatings and sealers. Do not install anchor in delaminated or weak substrates. Follow the Technical Performance Specifications for Anchoring, at www.CTScement.com, to properly prepare the anchor hole.

APPLICATION: The minimum application temperature is 41ºF (5ºC) and rising. The maximum application temperature is 104ºF (40ºC). Cartridge temperature needs to be a minimum of 41°F (5°C); optimal temperature is 68°F (20°C). For best results, place adhesive when the ambient temperature is between 68°F and 86°F (20°C and 30°C). Ensure surface, personnel and equipment are ready before application. Unscrew top and screw on the provided nozzle onto the mouth of the cartridge. Insert the cartridge into a quality extrusion gun with a minimum of 18:1 thrust ratio. Extrude material with three full pumps until an even red color, without streaks, flows out. Refer to the Fast Anchoring Adhesive ESR-5206 Installation Instruction Card.

CURING: At 68°F (20°C), working time is 30 minutes and is load bearing ready in 10 hours.

Cartridge Temperature	Gel & Work Time	Cure Time Dry Substrate	Cure Time Wet Substrate
*41°F (5°C)	180 min	50 hours	100 hours
*50°F (10°C)	120 min	24 hours	48 hours
68°F (20°C)	30 min	10 hours	20 hours
86°F (30°C)	20 min	6 hours	12 hours
104°F (40°C)	12 min	4 hours	8 hours

*For installations in base material temperature between 41°F and 50°F (5°C and 10°C) the cartridge temperature must be conditioned to between 41°F and 68°F (5°C and 20°C).

COLD WEATHER: Installation in low temperatures will extend cure times of the Rapid Set® FAST ANCHORING & REPAIR ADHESIVE. To ease flow and placement in cold conditions, warm the cartridge above 50°F (10°C) for 24 hours prior to installation. Remove dew, frost or ice from the substrate with acetone on a clean cloth, then place adhesive immediately.

OVERVIEW

Highlights:

- Superior pull-out strength
- Use on cracked or uncracked concrete
- High chemical resistance
- Can be used for overhead applications
- Fill non-moving cracks and joints
- Bonds in water filled anchor holes

Conforms to:

ASTM C881 Type IV, Grade 3, Class A, B, C

Certified:

ICC ES ESR-5206

City of Los Angeles Building Code (LABC)
City of Los Angeles Residential Code (LARC)
International Building Code (IBC)
International Residential Code (IRC)
Florida Building Code
Florida Residential Code

MasterFormat® 2016

03 05 07	Adhesives for Concrete
09 05 00	Adhesives – Common Work Results, Finishes
99 00 00	Construction & Industrial Products

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

FAST ANCHORING & REPAIR ADHESIVE

Multi-Purpose Two-Component Structural Epoxy

WARM WEATHER: Installation in warmer temperatures, at 86°F (30°C) and above, will not adversely affect adhesive performance. Warmer temperatures will decrease viscosity, working and cure time.

CLEAN-UP: Clean up with acetone and disposable rags before it hardens on placement tools and surfaces. Dispose of waste material in compliance with local regulations.

PACKAGING: FAST ANCHORING & REPAIR ADHESIVE is available in a 9.5 fl. oz. (280 mL) cartridge.

SHELF LIFE: When stored correctly, the shelf life is 24 months from the date of manufacture.

STORAGE: Store upright in original, unopened container, in a cool, dry, area. Protect unopened container from water, heat and direct sunlight. Store at 41°F to 85°F (5°C to 29°C). Elevated temperatures will reduce shelf life.

LIMITATIONS: Not for use in delaminated or weak substrates. The maximum long-term temperature of the base material should not exceed 110°F (43°C) and the maximum short-term temperature should not exceed 150°F (65°C). Consult a design professional prior to use. The design professional on the job is ultimately responsible for the interpretation of the data provided above and potential safety hazards.

For specific information on tension loads, anchor size, steel failure, pullout and concrete cone failure, concrete breakout, and concrete edge failure, consult the Fast Anchoring Adhesive Technical Performance Specification.

USER RESPONSIBILITY: Before using, read current technical data sheets, bulletins, product labels and safety data sheets. It is the user's responsibility to review the instructions and warnings for any CTS products prior to use. Wear chemical resistant gloves and protect eyes and skin during use. Do not attempt to force adhesive out of a hardened mixing nozzle. Use a new mixer nozzle to avoid rupturing the container. If a leak should develop, discontinue use immediately and use a new cartridge. While all reasonable care is taken in compiling technical data on the company's products, all recommendations or suggestions regarding the use of such products are made without guarantee, since the conditions of use are beyond the control of the company. It is the responsibility of the customer to confirm that the product is fit for the purpose for which it is intended to be used.

WARNING: DO NOT BREATHE VAPORS. AVOID CONTACT WITH SKIN AND EYE. Do not breathe vapors. Use product in well ventilated areas. Forced local exhaust is recommended to effectively minimize exposure. NIOSH approved, organic vapor respirators are recommended in confined areas, or when conditions (such as heated polymer, sanding) may cause high vapor concentrations. Do not weld on, burn, or torch any epoxy material. Hazardous vapor is released when an epoxy is burned. For additional information, refer to the precautionary statement on the Safety Data Sheet.

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, within 18 months from date of manufacture, will replace material proven defective or refund purchase price thereof, and such replacement or refund 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

TYPICAL PHYSICAL DATA

Color (when mixed)	Red
Gel Time ASTM C881	30 minutes
Bond Strength ASTM C882	1,980 psi (13.6 MPa) (2 day cure)
	2,400 psi (16.5 MPa) (14 day cure)
Compressive Strength ASTM D695	11,360 psi (78.3 MPa) (7 days)
Compressive Modulus ASTM D695	670,000 psi (4619.5 MPa) (7 days)
Water Absorption ASTM D570	0.1%
Heat Deflection Temperature (HDT) ASTM D468	135° F (49°C)
Linear Coefficient of Shrinkage ASTM D2566	0.001 in/in
Shore D ASTM D2240	90 (15 hours)
Volatile Organic Compounds (VOC) ASTM D2369	70 g/L

Note: ASTM Standards are current unless otherwise stated.
Data obtained at 73°F (23°C)

VOC Compliance (Volatile Organic Compound)

Meets U.S. EPA 40 CFR 59 Subpart C & D; CARB: California Air Resource Board; LADCO: Lake Michigan Air Directors Consortium (Illinois, Indiana, Michigan, Wisconsin); MRPO: Midwest Regional Planning Organization (Illinois, Indiana, Michigan, Ohio, Wisconsin); SCAQMD: South Coast Air Quality Management District (Los Angeles, Orange, Riverside, San Bernardino Counties); and CEPA/EC: Canada Environmental Protection Agency/Environment.

ULTRA-FAST ANCHORING ADHESIVE

Two-Component, High Strength Vinyl Ester, Styrene-Free Structural Adhesive

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® ULTRA-FAST ANCHORING ADHESIVE is a two-component, high strength vinyl ester, styrene-free structural adhesive designed to develop a strong, durable bond to concrete and masonry materials. The high-performance mechanical bond strength, pull-out strength and heat deflection temperature make it ideal for use as a rigid structural, chemical anchor adhesive in a wide range of temperatures.

USES: Use ULTRA-FAST ANCHORING ADHESIVE on properly prepared concrete and masonry substrates. It has a high chemical resistance for use in environments such as swimming pools with chlorine or near salt water. It is ideal for anchoring bolts, dowels, rebar, and wall ties to concrete, concrete blocks, stone, and other masonry substrates. It is also ideal for adhering metal profiles, wood and roofing. Do not apply into porous or reconstituted stone. This material is not intended for use as a cosmetic or decorative product. The resin may cause staining in certain materials.

SURFACE PREPARATION: Ensure the substrate is clean, sound and free of bond inhibitors, such as grease, oil, mold, coatings and sealers. Do not install anchor in delaminated or weak substrates. Follow the Technical Installation Procedures for Anchoring, at www.CTScement.com, to properly prepare the anchor hole.

APPLICATION: The minimum application temperature is 14°F (-10°C) and rising. The maximum application temperature is 104°F (40°C). The cartridge temperature must be conditioned to between 41°F and 95°F (5°C - 35°C). For best results, place adhesive when the ambient temperature is between 68°F and 77°F (20°C and 25°C). Ensure surface, personnel and equipment are ready before application. Unscrew top and screw on the provided nozzle onto the mouth of the cartridge. Insert the cartridge into a quality extrusion gun with a minimum of 18:1 thrust ratio. Extrude material with three full pumps until an even gray color, without streaks, flows out. Refer to the Ultra-Fast Anchoring Adhesive ESR-4473 Installation Instruction Card.

CURING: At 70°F (21°C), working time is 6 minutes and is load bearing ready in 45 minutes.

Substrate Temperature	Gel & Working Time	Cure Time Dry Substrate	Cure Time Wet Substrate
*14°F (-10°C)	90 min	24 hours	48 hours
*23°F (-5°C)	90 min	14 hours	28 hours
32°F (0°C)	45 min	7 hours	14 hours
41°F (5°C)	25 min	2 hours	4 hours
50°F (10°C)	15 min	80 min	160 min
70°F (21°C)	6 min	45 min	90 min
86°F (30°C)	4 min	25 min	50 min
95°F (35°C)	2 min	20 min	40 min

*For installations in base material temperature between 14°F and 23°F (-10°C and -5°C). The cartridge temperature must be conditioned to between 60°F and 95°F (16°C - 35°C).

COLD WEATHER: Installation in low temperatures will extend cure times of the ULTRA-FAST ANCHORING ADHESIVE. To ease flow and placement in cold conditions, warm the cartridge between 60°F and 95°F (16°C and 35°C) for 24 hours prior to installation. Remove dew, frost or ice from the substrate with acetone on a clean cloth, then place

OVERVIEW

Highlights:
Cure time 45 minutes at 70°F (21°C)
Bonds in water-filled anchor holes
High heat deflection temperature
Ideal in cold temperatures
Use on cracked or uncracked concrete
High chemical resistance; suitable in marine environments

Certified:
ICC ES ESR-4473
NSF Standard 61(Certified for drinking water applications)
Fire Resistance test report: 3290/0966
City of Los Angeles Building Code (LABC)
City of Los Angeles Residential Code (LARC)
International Building Code (IBC)
International Residential Code (IRC)
Florida Building Code
Florida Residential Code

MasterFormat® 2016	
Division: 03 00 00	Concrete
Section: 03 16 00	Concrete Anchors
Division: 05 00 00	Metals
Section: 05 05 19	Post-Installed Concrete Anchors

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

ULTRA-FAST ANCHORING ADHESIVE

Two-Component, High Strength Vinyl Ester, Styrene-Free Structural Adhesive

adhesive immediately.

WARM WEATHER: Installation in warmer temperatures at 80°F (27°C) and above will not adversely affect adhesive performance. Warmer temperatures will decrease viscosity, working and cure time.

CLEAN-UP: Clean up with acetone and disposable rags before it hardens on placement tools and surfaces. Dispose of waste material in compliance with local regulations.

PACKAGING: ULTRA-FAST ANCHORING ADHESIVE is available in a 9.5 fl. oz. (281 mL) cartridge.

SHELF LIFE: When stored correctly, the shelf life is 18 months from the date of manufacture.

STORAGE: Store upright in original, unopened container, in a cool, dry area. Protect unopened container from water, heat and direct sunlight. Store at 41°F to 85°F (5°C to 29°C). Elevated temperatures will reduce shelf life.

LIMITATIONS: Not for use in delaminated or weak substrates. The allowable temperature range for the base material, after full curing, is from -40°F to 248°F (-40°C to 120°C). Consult a design professional prior to use. The design professional on the job is ultimately responsible for the interpretation of the data provided above and potential safety hazards.

For specific information on tension loads, anchor size, steel failure, pullout and concrete cone failure, concrete breakout, and concrete edge failure, consult the Technical Performance Sheet for Ultra-Fast Anchoring at www.CTScement.com.

USER RESPONSIBILITY: Before using, read current technical data sheets, bulletins, product labels and safety data sheets. It is the user's responsibility to review the instructions and warnings for any CTS products prior to use. Wear chemical resistant gloves and protect eyes and skin during use. Do not attempt to force adhesive out of a hardened mixing nozzle. Use a new mixer nozzle to avoid rupturing the container. If a leak should develop, discontinue use immediately and use a new cartridge. While all reasonable care is taken in compiling technical data on the company's products, all recommendations or suggestions regarding the use of such products are made without guarantee, since the conditions of use are beyond the control of the company. It is the responsibility of the customer to confirm that the product is fit for the purpose for which it is intended to be used.

WARNING: DO NOT BREATHE VAPORS. AVOID CONTACT WITH SKIN AND EYE. Use product in well ventilated areas. Forced local exhaust is recommended to effectively minimize exposure. NIOSH approved, organic vapor respirators are recommended in confined areas, or when conditions (such as heated polymer, sanding) may cause high vapor concentrations. Do not weld on, burn or torch any vinylester material. Hazardous vapor is released when vinylester is burned. For additional information refer to the precautionary statement on the Safety Data Sheet.

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, within 18 months from date of manufacture, will replace material proven defective or refund purchase price thereof, and such replacement or refund 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

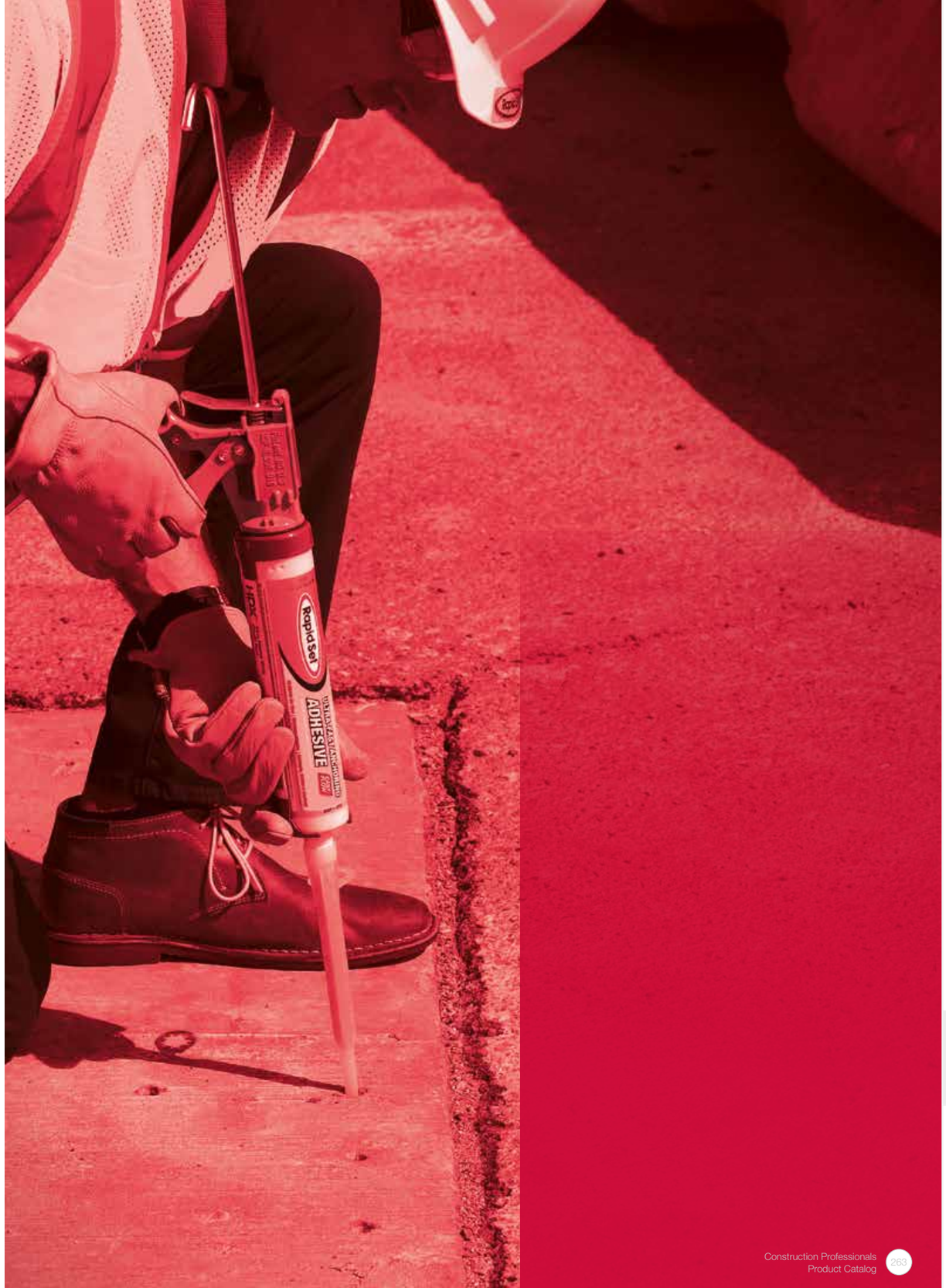
TYPICAL PHYSICAL DATA

Color (when mixed)	Gray
Gel Time	6 min
Bond Strength ASTM C882	1230 psi (8.5 MPa) (2 day cure)
	2320 psi (16 MPa) (14 day cure)
Compressive Strength ASTM D695	11,160 psi (77 MPa) (7 days)
Compressive Modulus ASTM D695	714,760 psi (4928 MPa)
E Modulus EN 196	2,031,930 psi (14009.7 MPa)
Flexural Strength EN 196	2170 psi (15.0 MPa)
Heat Deflection TEMPERATURE (HDT) ASTM D648	Short Term: 176°F (80°C)
	Long Term: 248° F (120°C)
Volatile Organic COMPOUNDS (VOC) ASTM D2369	70 g/L

Note: ASTM Standards are current unless otherwise stated.
Data obtained at 73°F (23°C)

VOC Compliance

Meets U.S EPA 40 CFR 59 Subpart C & D; CARB: California Air Resource Board; LADCO: Lake Michigan Air Directors Consortium (Illinois, Indiana, Michigan, Wisconsin); MRPO: Midwest Regional Planning Organization (Illinois, Indiana, Michigan, Ohio, Wisconsin); SCAQMD: South Coast Air Quality Management District (Los Angeles, Orange, Riverside, San Bernardino Counties); and CEPA/EC: Canada Environmental Protection Agency/Environment.



ADDITIVES

DATASHEETS

- FLOW Control®
- SET Control®
- Corrosion Inhibitor
- Bond
- Dark
- Fast
- Fiber
- Light
- Eisenwall Set Control

FLOW CONTROL

Additive to Increase Strength and Fluidity

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® FLOW CONTROL is a flow enhancing additive that allows higher fluidity or lower water requirement. Reducing water content by adding FLOW CONTROL will increase the final strength and durability.

USES: Use FLOW CONTROL with Rapid Set cement products. Add 1 to 4 packets of FLOW CONTROL to increase fluidity, and/or increase strength to satisfy jobsite requirements. A trial batch is recommended to fine-tune the dosage. FLOW CONTROL may be used in combination with all other products of the Rapid Set® Concrete Pharmacy®.

DIRECTIONS: Place desired amount of potable water into mixing container. Add half cement product into mixing container and mix with mechanical drill/mixer. Continue mixing while adding FLOW CONTROL 2.1-oz (60-grams) powder to mixing container. Add remaining cement product into mixing container. Follow product mixing instructions and maximum water requirements described on the package of the cement product. Mix to a workable, lump-free consistency. Do NOT exceed 4 packets per 50-lb to 70-lb bag of Rapid Set branded cement product. Too much water in the mixture may cause aggregate segregation, which can reduce strengths.

SHELF LIFE: FLOW CONTROL 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 Rapid Set products, read current technical data sheets, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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.

CALIFORNIA PROPOSITION 65: Not Listed/Not Regulated

OVERVIEW

Highlights:

- For use with Rapid Set® cement products
- Water reducing additive
- Increases fluidity
- Increases compressive strength

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

SET CONTROL

Set Retarding Admixture

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® SET CONTROL is a retarding admixture that extends the working time when placing and finishing Rapid Set cement products.

USES: Use SET CONTROL with Rapid Set cement products ONLY. SET CONTROL is ideal when additional working time is needed or to compensate for warm temperatures. One packet of SET CONTROL will extend the initial working time by approximately 10 to 20 minutes in normal conditions and does not reduce the long-term strength. SET CONTROL may be used in combination with other Rapid Set® Concrete Pharmacy® admixtures.

DIRECTIONS: Dissolve SET CONTROL into the mixing water. Use 1 to 4 packets per 50-lb to 70-lb bag of Rapid Set cement products to achieve the desired working time. A trial batch is recommended to fine tune the working time to match job site conditions.

BULK USE: 35-lb pails of SET CONTROL are also available for concrete mix designs. SET CONTROL is recommended for use at a dosage of 0.1 to 1 lb/cwt (45 to 450 grams/cwt) of cementitious materials for most concrete mixes. For high temperatures, dosages slightly higher than the recommended range may be required. SET CONTROL can also be pre-mixed with water to create a liquid admixture. Please contact a CTS Engineering Sales Representative for more specific dosage guidelines and recommendation.

PACKAGING: SET CONTROL is available in 0.9 oz (25 g), and 35 lb (16 kg) sizes.

SHELF LIFE: SET CONTROL 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 packet.

USER RESPONSIBILITY: Before using Rapid Set products, read current technical data sheets, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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.

CALIFORNIA PROPOSITION 65: Not Listed/Not Regulated

OVERVIEW

Highlights:

- For use with Rapid Set® cement products
- Extends working time

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CORROSION INHIBITOR

Triple Protection Against Corrosion

PRODUCT DATASHEET

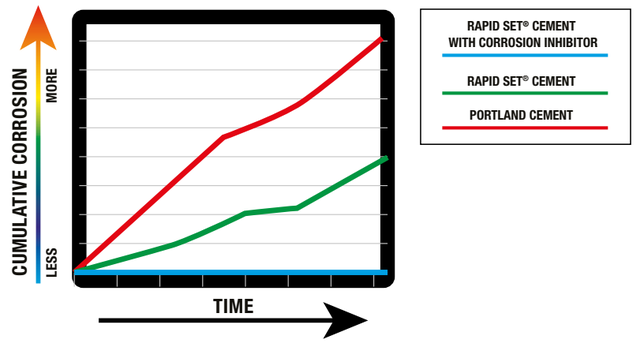
DESCRIPTION: Rapid Set® CORROSION INHIBITOR is a high performance additive designed to extend the life of reinforced concrete structures. Available in individual use packets, CORROSION INHIBITOR is a specialty powder additive that is combined with Rapid Set concrete repair materials during mixing. CORROSION INHIBITOR provides triple protection against corrosion by creating a protective barrier on embedded steel, repelling water and reducing chloride ion permeability.

USES: Use CORROSION INHIBITOR in corrosive environments such as marine applications, high humidity, roadways subject to deicing salt, and severe weathering. CORROSION INHIBITOR may be used in combination with all other products of the Rapid Set® Concrete Pharmacy®.

ENVIRONMENTAL ADVANTAGE: CORROSION INHIBITOR improves construction sustainability by increasing the life of your structure.

DIRECTIONS: Use one 1.7-oz (50-grams) packet of CORROSION INHIBITOR per 50-lb to 70-lb bag of Rapid Set pre-blended concrete repair product. For severe conditions, up to 2 packets may be added. Use only with approved Rapid Set products. Place water into the mixing container. While mixing, add half the dry cement product. While continuing to mix, add CORROSION INHIBITOR packet(s) followed by the remainder of the cement product. Combine with other Concrete Pharmacy products for added performance.

PACKAGING: CORROSION INHIBITOR is available in 1.7-oz (50-g) packets.



OVERVIEW

Highlights:

- Creates a protective barrier on embedded steel
- Acts as a water repellent
- Reduces chloride permeability

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CORROSION INHIBITOR Triple Protection Against Corrosion

SHELF LIFE: CORROSION INHIBITOR 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 concrete, 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 concrete 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.

CALIFORNIA PROPOSITION 65: Not Listed/Not Regulated

TYPICAL PHYSICAL DATA

CTS 714 Water Absorption Test Method	
37% reduction in absorbed water*	

ASTM C1202/AASHTO T-277 Chloride Permeability	
28 days	400 to 900 coulombs

*As compared to a sample with no corrosion inhibitors

BOND

Vinyl Polymer Additive

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® BOND is a free-flowing polymer powder used in a variety of construction applications to improve bond strength and impact resistance.

USES: Use BOND with Rapid Set cement products ONLY. Add 1 to 4 packets of BOND to increase workability, bond strength and impact resistance. A trial batch is recommended to fine-tune the dosage. BOND may be used in combination with all other products of the Rapid Set® Concrete Pharmacy®.

DIRECTIONS: For best results, dry blend BOND packets uniformly into cementitious Rapid Set product. **Use 1 to 4 packets of BOND per 50-lb to 70-lb bag of Rapid Set product.** Follow the mixing instructions described on Rapid Set product packaging.

PACKAGING: BOND is available in 2.3-oz (65-g) packets.

SHELF LIFE: BOND 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 Rapid Set products, read current technical data sheet, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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

CANCER and REPRODUCTIVE HARM - www.P65Warnings.ca.gov

OVERVIEW

Highlights:

- For use with Rapid Set® cement products
- Increase bond strength
- Add vinyl fortifier to any concrete, mortar or grout

MasterFormat® 2016

03 05 00 Concrete Bonding Agents, Admixtures and Adhesives

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

DARK

Gray Pigment Admixture

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® DARK is a pigment additive that darkens the color of cement. Use varying amounts of achieve desired shades of gray.

USES: Use DARK with Rapid Set cement products ONLY. Use varying amounts to achieve the desired shade of gray. A trial batch is recommended to fine-tune the dosage. DARK may be used in combination with other Rapid Set® Concrete Pharmacy® products.

DIRECTIONS: Dry blend DARK packets uniformly into cementitious Rapid Set product. Add as many packets as needed to achieve desired tinting. Follow the mixing instructions and do not exceed the maximum water described on the Rapid Set product packaging. Contact your CTS representative for project support at 1-800-929-3030.

PACKAGING: DARK is available in 4.2 oz (120 g) packets.

SHELF LIFE: DARK 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: DARK may affect the physical properties of the final product. Before using Rapid Set products, read current technical data sheet, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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.

CALIFORNIA PROPOSITION 65: Not Listed/Not Regulated

OVERVIEW

Highlights:

- For use with Rapid Set® cement products
- Darken the color of your mixture

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

FAST

Accelerating Additive

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® FAST is an admixture designed to speed up the setting time of Rapid Set® cement products in cold weather environments.

USES: Use FAST with Rapid Set cement products ONLY. FAST is ideal when accelerated strength is needed due to lower temperatures. FAST may be used in combination with other Rapid Set® Concrete Pharmacy® admixtures.

DIRECTIONS: Dissolve FAST into the mixing water. Use 1 to 5 packets per 50-lb to 70-lb bag of Rapid Set product to achieve the desired acceleration. Mechanically mix to complete dispersion (1 to 2 minutes). Add Rapid Set product to accelerated mix water. Cement will harden quickly while mixing.

PACKAGING: FAST is available in 2.8-oz (80-g) packets.

SHELF LIFE: FAST 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 packet.

USER RESPONSIBILITY: Before using Rapid Set products, read current technical data sheet, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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.

CALIFORNIA PROPOSITION 65: Not Listed/Not Regulated

OVERVIEW

Highlights:

- For use with Rapid Set® products
- Designed for applications in low temperatures

MasterFormat® 2016

03 05 00	Concrete Bonding Agents, Admixtures and Adhesives

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

FIBER

Synthetic Fiber Reinforcement

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® FIBER is a 100% pure 1/2" polypropylene multifilament fiber containing no reprocessed materials. FIBER increases impact resistance and helps prevent shrinkage cracking in concrete, mortar, and grout mixes.

USES: FIBER is designed for use with Rapid Set products. Multiple FIBER packets may be used to achieve the required reinforcement. FIBER may be used in combination with all other Rapid Set Concrete Pharmacy® products.

DIRECTIONS: For best results, dry blend FIBER packets uniformly into cementitious Rapid Set product. Add FIBER packets as required to concrete, mortar, and grout mixtures. Follow the mixing instructions described on Rapid Set product packaging.

PACKAGING: FIBER is available in 1.4-oz (40-g) packets.

SHELF LIFE: FIBER 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 packet.

USER RESPONSIBILITY: Before using Rapid Set products, read current technical data sheet, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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's 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

OVERVIEW

Highlights:

- Designed exclusively for Rapid Set® products
- Increase abrasion and crack resistance

MasterFormat® 2016

03 24 00 Fibrous Reinforcing

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

LIGHT

White Pigment Admixture

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® LIGHT is a pigment additive that lightens the color of the mixture.

USES: Use LIGHT with Rapid Set cement products ONLY. Use varying amounts to achieve the desired tint. A trial batch is recommended to fine-tune the dosage. LIGHT may be used in combination with other Rapid Set® Concrete Pharmacy® products.

DIRECTIONS: Dry blend LIGHT packets uniformly into cementitious Rapid Set product. Add as many packets as needed to achieve a desired tint. Follow the mixing instructions and do not exceed the maximum water described on the Rapid Set product packaging. Contact your CTS representative for project support at 1-800-929-3030.

PACKAGING: LIGHT is available in 2.8 oz (80 g).

SHELF LIFE: LIGHT 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: LIGHT may affect the physical properties of the final product. Before using Rapid Set products, read current technical data sheet, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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**
CANCER - www.P65Warnings.ca.gov

OVERVIEW

Highlights:

- Designed exclusively for Rapid Set® products
- Lighten the color of your mixture

Manufacturer:

CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

EISENWALL® SET CONTROL®

Set Retarding Admixture

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® EISENWALL® SET CONTROL is a retarding admixture that extends the working time when placing and finishing Rapid Set EISENWALL branded products.

USES: Use EISENWALL SET CONTROL with Rapid Set EISENWALL branded cement products ONLY. EISENWALL SET CONTROL is ideal when additional working time is needed or to compensate for warm temperatures. One packet of EISENWALL SET CONTROL will extend the initial working time by approximately 10 to 20 minutes in normal conditions and does not reduce the long-term strength. EISENWALL SET CONTROL may be used in combination with other Rapid Set® Concrete Pharmacy® admixtures.

DIRECTIONS: Dissolve EISENWALL SET CONTROL into the mixing water. Add up to 2 packets as needed to achieve the desired hardening results. Each packet is designed to add 30 to 60 minutes of working time to each 88-lb bag of Rapid Set EISENWALL.

PACKAGING: EISENWALL SET CONTROL is available in 5.7-oz (163-g) packets.

SHELF LIFE: EISENWALL SET CONTROL 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 packet.

USER RESPONSIBILITY: Before using Rapid Set products, read current technical data sheets, bulletins, product label and safety data sheet at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any Rapid Set product in current technical data sheet, bulletins, product label and safety data sheet prior to use.

WARNING: CAUSES MILD SKIN IRRITATION. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SERIOUS EYE IRRITATION. 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, immediately wash with soap and water. In case of eye contact, flush immediately and repeatedly with clean water, and consult a physician. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

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.

CALIFORNIA PROPOSITION 65: Not Listed/Not Regulated

OVERVIEW

Highlights:

- Retarder additive designed for use with Rapid Set® Eisenwall®
- Extends working time

Manufacturer:

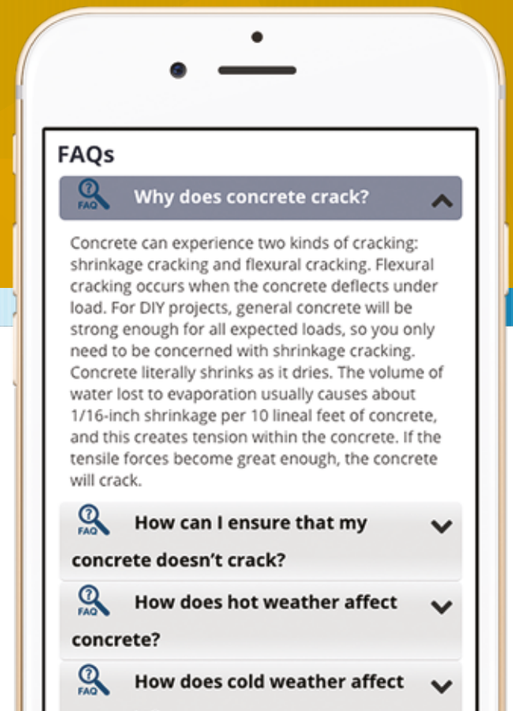
CTS Cement Manufacturing Corp.
12442 Knott St.
Garden Grove, CA 92841
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

RESOURCES & SUPPORT

STILL HAVE QUESTIONS?

We are here for you! CTS Cement Manufacturing offers a large amount of resources that are available 24 hours a day on our website. Visit www.CTScement.com to find information on:

- Frequently Asked Questions
- SDS Sheets
- Product Specifications
- Technical Bulletins



DID YOU KNOW?

If you still have questions, you can give us a call at our corporate office from 8:00am-5:00pm PST

1(800) 929-3030

CTS CEMENT

CUSTOMER SUPPORT

CTS Customer Support helps you reach your goals! We are consistently recognized for providing superior service. We offer extensive support, training, and programs to help our customers reach their goals. Sell, use, or specify our products, and gain the following benefits:

- Educational Services
- Website Tools
- Technical Support
- Jobsite Support
- Displays & Point of Sale Signs
- Brochures & Catalogs
- Joint Sales / Business Calls
- Job Leads
- Store Service
- Vendor Events
- Product Knowledge Classes

TRAINING CENTER

CTS offers multi-dimensional training that covers the technical aspects of our products and the practical hands-on application of our materials. Through real-life applications, you will learn the best techniques on applying our products. After you have been trained, you will have learned the skills and gained the knowledge to recommend and use our products.

EDUCATIONAL SEMINARS

We offer educational sessions for contractors, engineers, architects, and municipalities so they have a better understanding and more options to make better choices. The educational sessions focus on industry information, product knowledge, and technical training.

WEBSITE TOOLS

An extensive knowledge base is accessible at www.CTScement.com. CTS has built an online community for specialty cement products. Product specifications, datasheets, and SDS are all available for easy and convenient download.

TECHNICAL SUPPORT

Call us with your questions and our Technical Support Team will be glad to help. Call 1-800- 929-3030, press “0” and ask for Tech. Support between the hours of 7:30 a.m. to 4:30 p.m. PST.

JOBSITE SUPPORT

Our team of experts is available to assist contractors and engineers with jobs. We can help get crews up to speed so that the finished results are satisfactory, and answer any questions.

DISPLAYS & POINT OF SALE SIGNS

We produce standard and custom displays, and point of sale signs for all merchandising solutions. Our merchandising and product packaging is clean, easy to understand, and shopper friendly.

BROCHURES & CATALOGS

We supply complimentary product literature that shows the advantages, benefits, and applications of our products. The literature works as an effective selling tool for your sales team and provides answers to your customers' technical questions.

JOINT SALES / BUSINESS CALLS

We will partner with your sales team to generate new business. Once you find new business, our sales team is always available for further support.

JOB LEADS

We provide job leads and product support for your sales team. Our advertising and promotions plan, direct mail program, and trade shows generate leads that we share with our dealers, retailers, and contractors.

STORE SERVICE

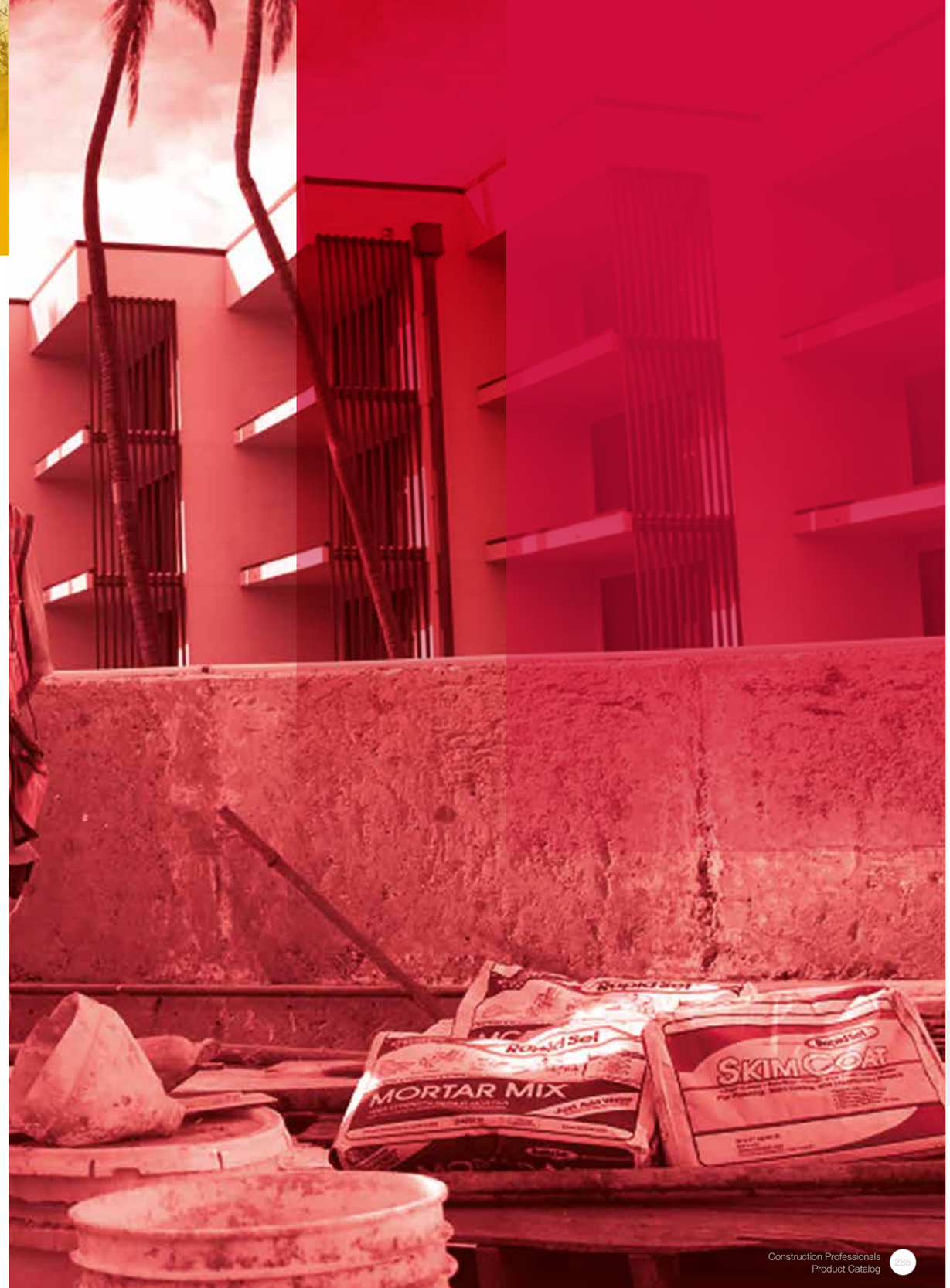
Our team thoroughly services your stores so that they are maintained on a consistent basis. We clean fixtures, organize and stock product, build displays, and install point of sale signs. We work with you to maintain adequate inventory levels within appropriate delivery times.

VENDOR EVENTS

We participate in a wide range of vendor events from trade shows and contractor events, to kids' clinics and grand openings, and much more. Our demonstrations and hands-on activity are proven to generate interest from attendees and bring positive exposure to our retailers and dealers.

PRODUCT KNOWLEDGE CLASSES

We provide training and hands-on demonstrations to make sure our retailers have a well-trained staff. Store employees who have participated in Product Knowledge Classes are more confident and competent, and generate significant sales increases.



CE COURSES

CE COURSES

13 AIA approved sessions are available to meet your educational needs related to concrete and concrete repair materials, overlays and toppings, decorative overlays, polished concrete, and geotechnical solutions. To learn more about using CSA advanced cement technologies to get exceptional results on your projects, review our index of CE Programs on the following pages, or online at www.CTScement.com

DID YOU KNOW?

For your convenience, on site presentations are available to maximize the time invested for your entire design team. Contact us today to schedule your next learning opportunity!

CEU Course Index

AIA Provider: H931

CTS Cement is proud to be a recognized Provider of CEU courses for the professional Engineering, Design & Construction communities. Our program offers valuable information on a variety of topics related to concrete and concrete repair materials. We offer Learning Units related to:

- Calcium Sulfoaluminate (CSA) Cement Technology
- Type K Shrinkage-Compensating Cement Concrete
- Polished Concrete & Overlays
- Rapid Hardening Hydraulic Cement Materials
- Overview of Hydraulic Cement Technologies

For your convenience, on site presentations are available to maximize the time invested for your entire design team. Contact us today to schedule your next learning opportunity!

www.ctscement.com (800) 929-3030

TYPE K SHRINKAGE-COMPENSATING CONCRETE

Design with Confidence Using Type K Shrinkage-Compensating Concrete in Commercial Project Designs

This session provides an overview of Type K Shrinkage Compensating Concrete and its use in common commercial applications. Its ability to minimize key challenges in concrete applications, like cracking, curling and drying shrinkage, and restraint to shortening are discussed, as well as the advantages it offers in joint placement design and reduced in-service operations and maintenance costs. Guidelines for designing and specifying Type K cement concrete are reviewed, as well as specification and installation "best practices" to ensure durable, long-term performance.
Course #: KSCC0615 (1 LU)

Design with Confidence Using Type K Shrinkage-Compensating Concrete in Industrial Project Designs

This course provides an overview of Type K Shrinkage Compensating Concrete and its use in common industrial applications. Its ability to minimize key challenges in concrete applications, like cracking, curling, drying shrinkage and restraint to shortening challenges are discussed, as well as the advantages it offers in joint placement design and reduced in-service operations and maintenance costs. Guidelines for designing and specifying Type K cement concrete are reviewed, as well as specification and installation "best practices" to ensure durable, long-term performance. *Course #: KSCC0515 (1 LU)*

Understanding Type K Shrinkage-Compensating Concrete in Bridge & Highway Design

This course reviews the fundamentals of Type K Shrinkage-Compensating Cement technology and its use in Bridge & Highway construction projects. A review of key performance advantages of Type K is provided, along with common industry applications, key design considerations, specification recommendations, and best practices to ensure maximum long-term performance and successful installations. *Course #: BSCC0315 (1 LU/HSW)*

Understanding Type K Shrinkage-Compensating Concrete in Water Management & Wastewater Treatment Facility Designs

This course reviews the fundamentals of Type K Shrinkage-Compensating Cement Concrete technology and its use in Water Management and Wastewater Treatment construction projects. A review of key performance advantages of Type K cement is provided, along with common industry applications, key design considerations, specification recommendations, and best practices to ensure maximum long-term performance and successful installations. *Course #: WWSCC0515 (1 LU)*

Understanding Type K Shrinkage-Compensating Concrete in Parking Structures & Other Post-Tensioned Project Designs

This course provides an overview of Type K Shrinkage-Compensating Cement Concrete and its use in parking structures and post-tensioned project designs. Its ability to overcome key challenges faced in concrete durability and long-term performance are discussed, as well as key advantages Type K offers in joint placement design, increased abrasion and impact resistance, reduced in-service operations and maintenance costs, and lower life cycle costs. Guidelines for designing and specifying Type K are reviewed, as well as specification and installation "best practices" to ensure durable, long-term performance.
Course #: KSCC1115 (1 LU)

Create High-Performance Concrete Floor Slab Designs that Effectively Address Key Performance Challenges Related to Joint Failure and MVER Challenges

This course provides an overview of key performance advantages that can be achieved in concrete slab-on-ground designs by integrating CSA cements and CSH technology. Participants will learn how combining these high-performance technologies maximize protection against costly moisture vapor emissions challenges while providing increased design flexibility and minimizing joint requirements. The cost advantages of proactively managing moisture risk mitigation, reducing joint requirements, and minimizing costly facility downtime and maintenance of joints and moisture sensitive floor coverings will be reviewed. Practical applications in industrial, institutional, and commercial market segments are discussed. Participants will understand how these materials offer complementary advantages that optimize performance and ease constructability. *Course #: KCON1118 (1 LU)*

RAPID HARDENING HYDRAULIC CEMENT MATERIALS

Designing Performance & Project Efficiencies into Concrete Structures Using Rapid Setting Hydraulic CSA Cement

This session reviews basic calcium sulfoaluminate (CSA) cement technology and how it differs from standard cement materials. Performance advantages of Rapid Hardening Hydraulic Cement Materials (ASTM C1600) based on CSA compounds are reviewed, as well as project efficiencies that can be achieved when using CSA cement based concrete and concrete repair materials. Common products readily available in the marketplace for commercial, industrial and infrastructure applications use are reviewed, as well as design, installation and specification considerations. An overview of CSA's sustainability aspects and LEED credit potential is also provided. *Course #: RS0615 (1 LU)*

Maximizing Efficiency & Long-Term Performance with Rapid Hardening Hydraulic Cement Materials for Concrete Rehabilitation & Repair Projects

This course discusses key challenges related to durability and compatibility of repair materials in concrete rehabilitation & repair projects. The performance advantages of Rapid Hardening Hydraulic Cement Materials (ASTM C1600) based on Calcium Sulfoaluminate (CSA) compounds are reviewed, along with the various materials available for concrete rehabilitation and repair in industrial, institutional, and commercial projects. Sustainability advantages are discussed, as well as design, installation and specification recommendations to ensure maximum long-term performance.
Course #: RS0515 (1 LU)

Understanding the Advantages of High-Performance, Calcium Sulfoaluminate (CSA) Cement Material Solutions for Tunneling & Mining Applications

This session reviews basic calcium sulfoaluminate (CSA) cement technology and how it differs from standard cement materials. Performance advantages of Rapid Hardening Hydraulic Cement Materials (ASTM C1600) based on CSA compounds are reviewed, as well as project efficiencies that can be achieved when using CSA cement-based shotcrete, structural grouts, flowable fill and other common industry materials. Underground mining, construction, excavation and tunneling applications are reviewed, along with design, installation and specification considerations. An overview of CSA's sustainability aspects and LEED credit potential is also provided. *Course #: RTMS0615 (1 LU)*

Maximizing the Advantages of Rapid Hardening, Calcium Sulfoaluminate (CSA) Cement Materials for Commercial & Recreational Shotcrete Applications

This session reviews basic calcium sulfoaluminate (CSA) cement technology and the performance advantages of Rapid Hardening Hydraulic Cement Materials (ASTM C1600). Project efficiencies that can be achieved when using CSA cement-based shotcrete, structural grouts, flowable fill and other common industry materials in commercial and recreational applications are reviewed, along with installation and specification considerations. An overview of CSA's sustainability aspects and LEED credit potential is also provided. *Course #: RSSHTC0715 (1 LU)*

CALCIUM SULFOALUMINATE (CSA) CEMENT TECHNOLOGY

Designing for Maximum Durability, Service-Life and Minimal Maintenance in New Concrete Structures and Concrete Repair & Renovation Projects with CSA (Calcium Sulfoaluminate) Cement

This course discusses key durability, longevity and maintenance challenges faced in concrete structures and concrete repair & renovation projects and reviews the science, technology and performance advantages calcium sulfoaluminate (CSA) cement offers in today's built environment. Common materials and practical applications of use in infrastructure, industrial, institutional, and commercial market segments are reviewed. Participants will understand how this high-performance cement technology achieves durable, low maintenance, long-life concrete solutions, and maximizes design versatility. Industry standards and best practices are reviewed, as well as specification recommendations to ensure successful installations and maximize long-term performance.
Course #: CSAT0415 (1 LU)

Optimizing Design Performance and Constructability in Tilt-Up Construction by Integrating CSA Cements and Micro-Rebar Technologies

This course provides an overview of key performance advantages that can be achieved by integrating CSA cements and micro-rebar technologies in tilt-up construction. Combining these high-performance materials maximizes design flexibility, improves long-term performance of slabs and walls, and speeds time to completion. Practical applications in industrial, institutional, and commercial market segments are reviewed. Participants will understand how these materials offer complementary advantages that optimize performance and ease constructability. Industry standards and best practices are reviewed, as well as specification recommendations to ensure successful installations and designed performance.
Course #: CSAMR1018 (1 LU)

Understanding Hydraulic Cements and Their Distinctive Performance Characteristics

This session provides a fundamental overview of portland, blended and other specialty hydraulic cements. Key differences in cement types, their performance characteristics, and their common uses in industry applications are reviewed. Highlights of the role concrete plays in sustainable designs are provided, and key considerations for selecting and specifying cements are provided.

Course #: GCK101 (1LU)

Using Advanced Concrete & Concrete Repair Solutions in Commercial Project Designs

This course provides an overview of concrete and concrete repair solutions for commercial projects engineered with calcium sulfoaluminate (CSA) cement technology. An overview of key performance advantages in commercial project design is provided, with a focus on durability, installation efficiencies, reduced operations and maintenance costs, and design versatility. Common products used in commercial, hospitality, recreational, and retail projects will be reviewed, as well as an overview of the sustainability advantages of CSA cement. Participants will gain an understanding of how CSA cement contributes to long-term durability, extended asset life, and reduced life-cycle costs.
Course #: CSACOMM0515 (1 LU)

Using High-Performance Concrete & Concrete Repair Materials for Civil & Military Aviation Projects

This course reviews common challenges related to concrete and concrete repair within the aviation industry. An overview of calcium sulfoaluminate (CSA) cement technology is provided, along with detailed discussion regarding the key performance advantages of CSA cement-based materials. Long-term durability, extended service life, installation efficiencies, reduced downtime, and reduced operations and maintenance costs are discussed. Common CSA-cement based products used within the industry are reviewed, as well as the sustainability advantages of CSA cement technology. *Course #: CSAAV0615 (1 LU)*

POLISHED CONCRETE

Maximize Durability, Design Versatility & Installation Efficiency in Polished Concrete Designs

This course reviews the key aspects of designing, specifying and installing beautiful, resilient, polished concrete floors & polished overlayments. Essential substrate preparation considerations and joint treatment are reviewed, as well as material options engineered to maximize durability and installation efficiency for new and rehabilitation/repair projects. You'll discover the design versatility polished concrete finishes offer, as well as important specification recommendations and best practices to ensure successful installations and long-term performance.
Course #: PCTRU0415 (1 LU)

Polished Concrete Overlayments – Concrete Overlays that Provide Durability, Beauty and Minimal Maintenance

This session reviews high-performance concrete overlayments designed for use in commercial, industrial and residential applications. Key aspects of designing, specifying and installing beautiful, resilient, polished concrete overlayments are reviewed. The advantages of low moisture, fast-curing, self-leveling overlayments are explored. Important considerations and product selection for specialty applications are identified. And, the contributions of polished concrete overlayments to green and sustainable designs are discussed. *Course #: PCTRU0817 (1 LU)*

GENERAL CEMENT EDUCATION

Understanding Hydraulic Cements and Their Distinctive Performance Characteristics

This session provides a fundamental overview of portland, blended and other specialty hydraulic cements. Key differences in cement types, their performance characteristics, and their common uses in industry applications are reviewed. Highlights of the role concrete plays in sustainable designs are provided, and key considerations for selecting and specifying cements are provided.
Course #: GCK101 (1LU)

CTS Cement Manufacturing Corp. is proud to be a recognized Provider of CEU courses for the Design, Engineering & Construction communities. Our program offers valuable information on a wide variety of topics related to cement, concrete, concrete repair, bridge deck & highway applications, architectural finishes/overlay toppings, and underlayments for new and renovation/rehabilitation projects.

CTS Cement Manufacturing Corp. ● (800) 929-3030 ● info@ctscement.com

NOTES