

A photograph of construction workers on a site, wearing hard hats and high-visibility vests. The floor is made of a perforated metal grid. The image is dark and has a grainy texture.

CERATECH

The Leader in High Performance GREEN Sustainable Cements



The Leader in High Performance GREEN Sustainable Cements

Company & Technology History Overview

- *Began initial fly ash cement development effort (1994)*
- *Original ceramic cement technology (1998 - 2005)*
 - *Worldwide technology leader*
 - *Raw material costs limit market opportunities*





Company & Technology History Overview (Continued)

■ Fly ash cement technology (2005 - present)

- Leveraged fly ash expertise

- Developed high performance “GREEN” cement

- Superior performance characteristics to ordinary Portland cement (OPC)

- Recent technical advancements have reduced costs to less than OPC in scale

★ 15 years and more than \$20M expended towards technology development effort



SL

MAIN LINE
4 HOUR REPAIR CONCRETE

DOTLINE
RAPID REPAIR CONCRETE

RediMAX

GREAT WHITE
RAPID CEMENT

Fly Ash Is An Asset

- *A coal fired power generation plant produces CLINKER similar in concept to the CLINKER produced by a Portland cement production facility*
- *This fly ash CLINKER is the backbone component of CERATECH's cement technology. CERATECH's cement can be used as a direct replacement for OPC for all construction material uses and applications*



CERATECH
The Leader in High Performance GREEN Sustainable Cements



Technology Overview

- *Combine fly ash and proprietary admixtures to produce desired end state properties*
- *Superior mechanical and dimensional properties*
- *Material is mixed, placed and finished like OPC*
- *Drops into current industry distribution network*

★ *Secured or in the process of securing all requisite industry specifications & approvals*





GREEN Sustainable Construction Materials

- GREEN building materials are comprised of renewable, recycled or reusable resources
- Sustainable materials can be used indefinitely without negatively impacting the environment

★ CERATECH has the ONLY cement technology in the world that can be classified as GREEN sustainable cement



The Leader in High Performance GREEN Sustainable Cements



Environmental Impact Comparisons

One Ton of Cement



PORTLAND CEMENT

100% - Virgin Resources

0% - Renewable Substances

2000 lbs. - CO² Generated Via Production Process

0 lbs. - Material Diverted From Landfills

55 Gallons of Crude Oil - Required For Production



CERATECH GREEN CEMENT TECHNOLOGY

2% - Virgin Resources

0% - Portland Cement

8% - Renewable Substances

90% Coal Ash

90% Coal Ash

0 lbs. - CO² Generated Via Production Process

1800 lbs. - Material Diverted From Landfills

0 Gallons of Crude Oil - Required For Production

One Cubic Yard of Concrete



CONCRETE PRODUCED FROM PORTLAND CEMENT

100% - Virgin Resources

0% - Renewable Substances

0 - 30% Coal Ash

0% - Coarse Aggregate from Re-cycled Materials

667 lbs. - CO² Associated With Portland Cement Binder

Up to 225 lbs. - Material Diverted From Landfills



CONCRETE PRODUCED FROM CERATECH GREEN CEMENT TECHNOLOGY

2% - Virgin Resources

0% - Portland Cement

8% - Renewable Substances

90% Coal Ash

Up to 50% - Coarse Aggregate from Re-cycled Post Consumer Materials

0 lbs. - CO² Associated With CERATECH Cement Binder

600 lbs. - Material Diverted From Landfills

One CMU



A MASONRY BLOCK PRODUCED FROM PORTLAND CEMENT

100% - Virgin Resources

0% - Renewable Substances

0 - 30% Coal Ash

0% - Coarse Aggregate from Re-cycled Materials

4.5 lbs. - CO² Associated With Portland Cement Binder



A MASONRY BLOCK PRODUCED FROM CERATECH GREEN CEMENT TECHNOLOGY

2% - Virgin Resources

0% - Portland Cement

8% - Renewable Substances

90% Coal Ash

Up to 30% - Coarse Aggregate from Re-cycled Post Consumer Material Such as Glass

0 lbs. - CO² Associated With CERATECH Cement Binder

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MAIN LINE
4 HOUR REPAIR CONCRETE

DOTLINE
RAPID REPAIR CONCRETE

RediMAX

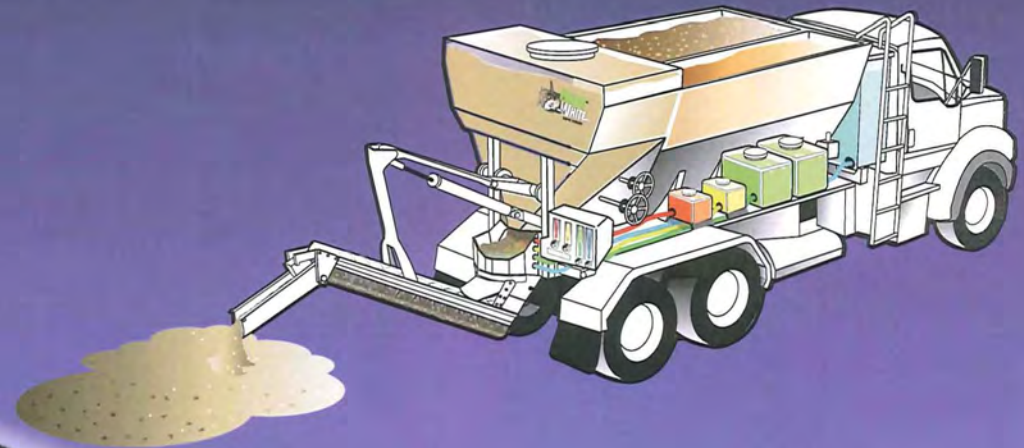
GREAT WHITE
RAPID CEMENT

CERATECH
The Leader in High Performance GREEN Sustainable Cements

Products & Applications

Volumetric Market

- Limited competition
- Significant cost advantage
- Superior material performance characteristics



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Products & Applications (Continued)

Precast Market

- Substantial improvements to manufacturing efficiencies
- Cost advantage
- High strength performance advantages
- GREEN sustainable technology

MAIN LINE
4 HOUR REPAIR CONCRETE

DOTLINE
RAPID REPAIR CONCRETE

RediMAX

GREAT WHITE
RAPID CEMENT

FORTRESS
CEMENT



CERATECH
The Leader in High Performance GREEN Sustainable Cements



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Products & Applications (Continued)

Block Market

- Substantial improvements to manufacturing efficiencies
- Cost advantage
- Superior performance advantages creates opportunity for a high strength block market
- GREEN sustainable technology

MAIN LINE
4 HOUR REPAIR CONCRETE

DOTLINE
RAPID REPAIR CONCRETE

RediMAX

GREAT WHITE
RAPID CEMENT

FORTRESS
CEMENT



CERATECH

The Leader in High Performance GREEN Sustainable Cements





Products & Applications *(Continued)*

Ready Mix Market

- Superior high performance characteristics
- Exceptional mix design flexibility
- GREEN sustainable technology



The Leader in High Performance GREEN Sustainable Cements



Green Sustainable Structural Building Material Technology

Driving Change Through
Innovative Thinking





GREEN "Sustainable" Construction

GREEN Building Materials

The United States Green Building Council (USGBC) defines green building materials as those materials composed of *renewable, recyclable or reusable* resources.

CERATECH utilizes *fly ash*, a post industrial waste stream to produce *the only high performance structural cement in the world that's comprised of more than 90% recycled waste materials!*

Sustainability

Sustainable construction materials are defined as those materials that can be used *indefinitely without negatively impacting the environment.*

CERATECH's *RediMAX* cement *clearly meets the definition for sustainable construction materials.*

Additional benefits of recycling fly ash to produce our cement: ▼

- Reduces demand on landfills – *60% of all ash produced annually is land filled*
- Preserves virgin materials – *eliminates* mining of raw materials needed to produce Portland cement
- Reduces CO² emissions by *replacing Portland cement* – for every ton of Portland cement produced, 1 ton of CO² is generated and released into the atmosphere (*Worldwide, the production of Portland cement contributes 6% to 10% of all human generated CO² gases released annually.*)
- Reduces energy consumption – CERATECH's cement is *produced via a low energy powder blending process* versus a high temperature, calcining process.

Leadership in Energy and Environmental Design

LEED®

Maximize Your LEED Points With

RediMAX™

The high percentages of pre-consumer waste streams that make-up CERATECH's cement technology may automatically qualify for LEED points in a number of categories, including:

Energy & Atmosphere

Credit 1.1 - Optimize Energy Performance: A 10.5% reduction in energy requirements due to the thermal insulating properties of RediMAX™

Materials & Resources

Credit 4.1, 4.2 - Recycled Content: CERATECH's cement *far exceeds the required pre-consumer recycled content by over 400%*. Additionally, RediMAX™ has the unique ability to be extended with *post-consumer* waste streams such as glass and re-cycled concrete as aggregate further enhancing its nearly total recycled content ratio.

Regional Materials Credit 5.1, 5.2 -

The fly ash required to manufacture our *RediMAX* cement is typically available to all major metropolitan areas and as such would qualify for the LEEDS points associated with regionally procured materials.

Innovation in Design

Credit 1.1 - Unique, high performance mechanical and dynamic characteristics allow for reductions in total concrete and reinforcing steel required. High early strength development also allows for increased construction efficiencies.



CERATECH is a member of the United States GREEN Building Council





Cement Technology Benefits

CERATECH has carefully engineered our cements for applications where speed, strength and durability are desired material performance characteristics. **Our materials conform to ASTM specifications for hydraulic cement.**

Energy Efficiency

Pozzolanic cements require 99% **LESS energy** to produce an equivalent amount of Portland cement.

Logistics

RediMax™ is shipped, handled, stored and batched like Portland cement. **RediMax™** cement can be shipped by truck, rail and/or barge.

Improved Durability

A critical component of sustainable construction is durability. We have designed our chemistry to allow us to maximize or in some cases minimize the following performance characteristics to create the **"next-generation" structural concrete.**

• Re-bar Corrosion Resistance

RediMax's™ low permeability helps to resist the establishment of a corrosion cell within the concrete matrix, thereby eliminating costs typically associated with traditional corrosion protection practices, coatings and sacrificial elements – **resulting in extended structure life cycle.**

• Sulfate Resistance

The inherent chemical properties of **RediMax™** dramatically increases its sulfate resistance exceeding the resistance exhibited by both Type II and Type V Portland cements thus eliminating the need to inventory multiple types of cement.

• Reduced Permeability

RediMax's™ uniform density and extremely fine pore structure dramatically increases its resistance to penetration by water or other substances. This reduction in permeability minimizes the requirement for an Air Entrainment Agent and allows **RediMax™** to easily pass both ASTM 666 A and B testing protocols.

• Compressive Strengths

RediMax's™ cement concrete possesses rapid hardening performance characteristics so that it easily generates 6 hour compressive strengths of 2,000 psi without negatively impacting working time. 28 day compressive strengths are usually greater than 9,000 psi while maintaining a moderate Modulus of Elasticity.

• Alkali Silica Reactivity (ASR)

CERATECH's material chemistry **greatly reduces the Alkali Silica Reaction** that occurs when certain aggregates are combined with Portland cement. This benefit allows for greater flexibility in aggregate selection for use in the concrete batching process, thereby reducing potential financial impacts to a project by **eliminating the need to import aggregates** that are compatible for use with Portland cement.

• Lower Heat of Hydration

For mass concrete applications, **RediMax™** cement concrete will, over time, generate approximately **30% of the heat typically generated by Portland cement** in large castings.

• Superior Mechanical & Dynamic Properties

RediMax™ cement typically **generates compressive strengths of more than 2,000 psi in 6 hours** with associated 28 day compressive strengths of more than 9,000 psi while maintaining a mild Modulus of Elasticity.

• Low Shrinkage

RediMax™ cement exhibits very small volume changes as it cures, producing dimensionally stable structural elements. This dimensional stability engineered into the **RediMax™** cement allows for increased spans (slab dimensions) while allowing for potential reduction in slab joint spacing. Additionally, low shrinkage reduces the potential for curling and warping of slabs based on the initial curing and temperature variants.

• Improved Flexural Strengths

Flexural strengths associated with **RediMax™** are typically 15 to 18% of corresponding compressive strengths. **RediMax™** cement allows for reduced loading stresses to the substrate for slab on grade work far more effectively than Portland cement concrete. Enhanced flexural capabilities also provide for the potential to incorporate longer spans for elevated structural applications.



**GREEN CEMENT
TECHNOLOGY**

The **RediMAX**TM Value Proposition

Value, Life Cycle ROI, Operating Expenses...

Reductions in construction costs as well as direct and indirect value of a building project can be greatly enhanced by the breadth of CERATECH's unique cement characteristics!

Construction Costs:

- **Reduce labor costs** by compressing project construction schedule
- **Reduce costs for leased items** such as shoring systems, formwork and special equipment
- **Eliminate issues associated with rejected concrete** due to 90 minute water to discharge requirement
- **Reduce material costs** (concrete and reinforcing steel) by as much as 30% due to higher strengths

Operating Expense:

- **Reduce heating and cooling costs** due to decreased overall thermal mass of building
- Exceptional **resistance to damage** from freeze thaw, scaling and chemical attacks.
- Extend eligibility for Local, State and Federal taxes via **GREEN BUILD incentive programs**

Innovation, Aesthetics and Environmental Leadership...

Innovation:

- Superior mechanical properties allow for **increased usable space** by reduced column footprints, floor slab thickness, ceiling heights and increased free span lengths
- **Increase fire ratings** by 30%
- Design economical, foam core dwellings with **sprayed-on, exceptionally high strength structural mortars**.
- Create **blast resistant structures**
- Rapidly build dry stacked cement block structures utilizing the revolutionary **FORTRESSTM** masonry system
- Design storm resistant **monolithic masonry structures**

Environmental Leadership:

- By specifying CERATECH's GREEN cement technology as either readymix concrete or masonry block, ***you will have eliminated one ton of carbon dioxide (CO₂) greenhouse gas for every 3 yards of concrete or 450 CMUs specified!***

Efficiency, Strength and Safety...

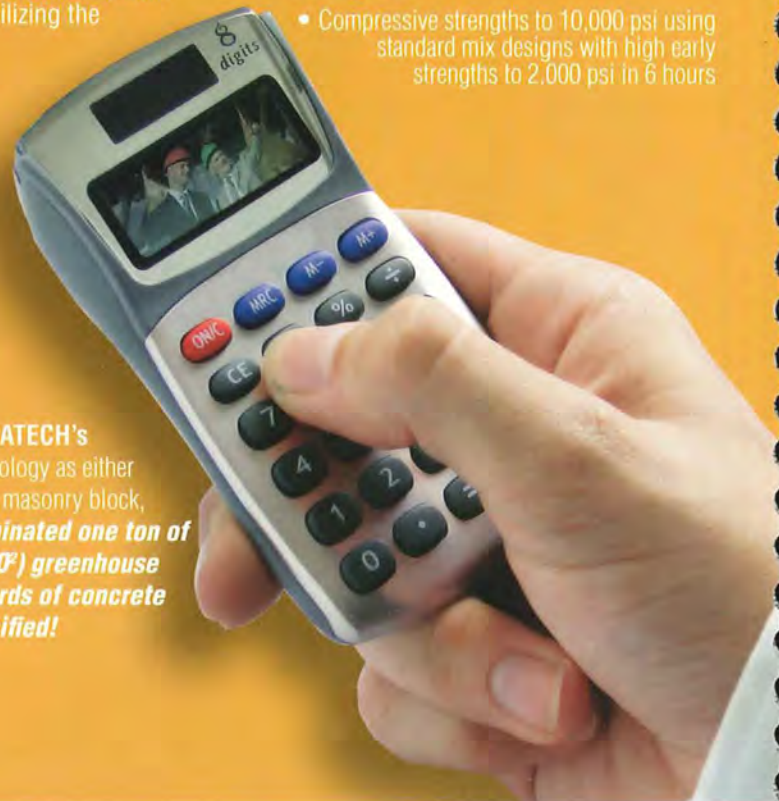
CERATECH's cement technology exceeds ASTM-C-1600 in all testing categories. Increased strengths allow for greater design flexibilities, efficiencies and overall superior building performance.

Design Efficiency:

- Ultra high strength hollow core floor planks allow for greater free span lengths
- Reduce overall building weight
 - Column cross sections can be reduced by nearly 40%
 - Reduce rebar requirements

Strengths:

- Compressive strengths to 10,000 psi using standard mix designs with high early strengths to 2,000 psi in 6 hours



Think Value, Think Performance, Think GREEN, Specify





CERATECH, Inc. is a materials technology company specializing in the development and the commercialization of innovative green sustainable cement technologies.

CERATECH's RediMAX cement is a Pozzolan cement containing no Portland cement. Pozzolans are traditionally defined as a crystalline porous aluminosilicate structure.
Examples: Volcanic Ash, Pumicite, and Opal Shale

The Romans used Pozzolans (volcanic ash) blended with lime to produce the cement used to build the Coliseum, the Pantheon and the Pont du Gard Aqueduct in Southern France, *all of which are still standing today.*

Recently, the definition of Pozzolans has been expanded to include post-industrial oxide structures that have well-defined pore structures.

Examples: Fly ash, wood ash, kiln dust or slag, and ash created by burning municipally derived waste "trash" at high temperatures.

CERATECH uses fly ash in the production of its RediMAX™ cement for all domestic production. Internationally, CERATECH sources locally available pozzolans, such as Class N volcanic ash to produce its cement.

Fly ash is the finely-divided coal combustion byproduct (waste stream) collected by electrostatic precipitators from flue gases. Approximately 60% (≈ 42 M tons) of all fly ash is land filled annually in the United States. The replacement of Portland cement with fly ash reduces the carbon footprint of concrete, as the production of one ton of Portland cement produces approximately one ton of CO².

CERATECH's revolutionary cement technology is a change step for the construction industry providing an environmentally friendly cement that is engineered for strength, speed, stability and long term durability.



Environmental Impact Comparisons

One Ton of Cement



PORTLAND CEMENT

100% - Virgin Resources

0% - Renewable Substances

2000 lbs. - CO² Generated Via Production Process

0 lbs. - Material Diverted From Landfills

55 Gallons of Crude Oil - Required For Production



CERATECH GREEN CEMENT TECHNOLOGY

2% - Virgin Resources

0% - Portland Cement
8% - Renewable Substances

90% Coal Ash

0 lbs. - CO² Generated Via Production Process

1800 lbs. - Material Diverted From Landfills

0 Gallons of Crude Oil - Required For Production

One Cubic Yard of Concrete



CONCRETE PRODUCED FROM PORTLAND CEMENT

100% - Virgin Resources

0% - Renewable Substances

0 - 30% Coal Ash

0% - Coarse Aggregate from Re-cycled Materials

667 lbs. - CO² Associated With Portland Cement Binder

Up to 225 lbs. - Material Diverted From Landfills



CONCRETE PRODUCED FROM CERATECH GREEN CEMENT TECHNOLOGY

2% - Virgin Resources

0% - Portland Cement
8% - Renewable Substances

90% Coal Ash

Up to 50% - Coarse Aggregate from Re-cycled Post Consumer Materials

0 lbs. - CO² Associated With CERATECH Cement Binder

600 lbs. - Material Diverted From Landfills

One CMU



A MASONRY BLOCK PRODUCED FROM PORTLAND CEMENT

100% - Virgin Resources

0% - Renewable Substances

0 - 30% Coal Ash

0% - Coarse Aggregate from Re-cycled Materials

4.5 lbs. - CO² Associated With Portland Cement Binder



A MASONRY BLOCK PRODUCED FROM CERATECH GREEN CEMENT TECHNOLOGY

2% - Virgin Resources

0% - Portland Cement
8% - Renewable Substances

90% Coal Ash

Up to 30% - Coarse Aggregate from Re-cycled Post Consumer Material Such as Glass

0 lbs. - CO² Associated With CERATECH Cement Binder

* Calculations based upon licensed 3rd Party laboratory (CTL) microscopy analysis of a random 1 pound sample of CERATECH's RediMAX™ Ultra GREEN Cement and Portland Cement CO² manufacturing statistics from the EPA.

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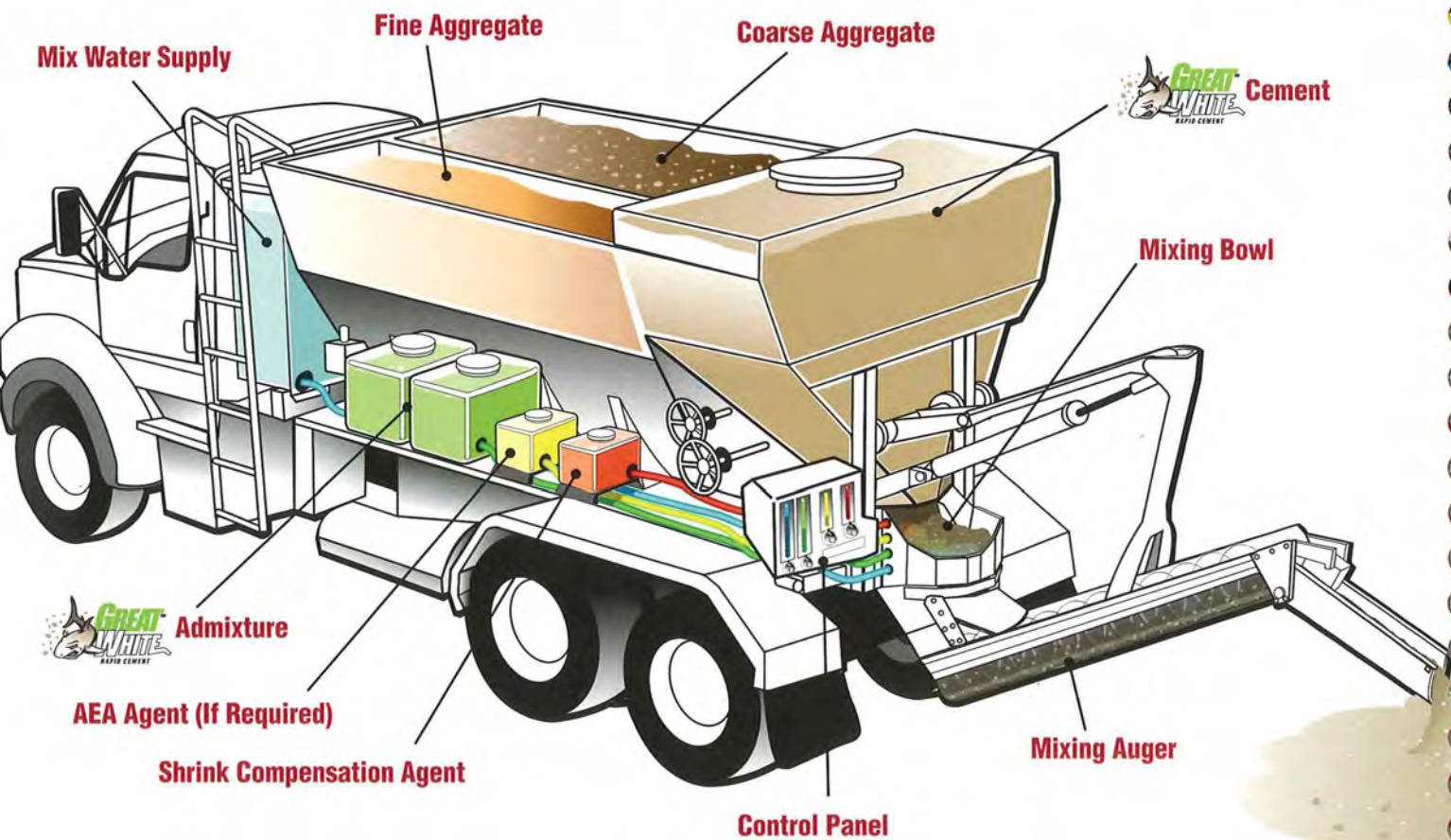


High Volume Rapid Infrastructure Repair & Construction Cement





Engineered Exclusively For Use With Volumetric Mixing Equipment!



CERATECH designs, manufactures and supplies highly engineered "green sustainable" concrete repair & construction cements that facilitate **RAPID RETURN TO SERVICE** of critical infrastructure assets and **compression of new construction time lines**.

CERATECH's products are **extremely environmentally friendly**, easy to use and provide for extended repair life cycles, thereby greatly reducing overall maintenance costs.

All of **CERATECH's** products are corrosion resistant and possess low permeability characteristics making them less susceptible to chloride, sulfate and chemical attack.

CERATECH's products are highly durable, resisting scaling and freeze thaw damage.

GreatWhite™ is an extremely versatile, rapid setting semi-leveling structural cement **specifically designed for use with volumetric mobile concrete mixers**.

It is a single component powder that is liquid activated. **GreatWhite™** has 20 minutes of working time and will (depending on mix design), reach compressive strengths more than 3,500 psi within 2 hours.

GreatWhite™ can be applied in ambient temperature ranges from 30 to 120 degrees Fahrenheit. **GreatWhite™ mixes, places and finishes like traditional Portland cement concrete!**



Case Study:

RAPID Full Depth Lane Replacement California Department of Transportation

September 2008



This deteriorated section of U.S. Highway 101 in Gilroy, CA. was selected to be replaced using concrete made with **GreatWhite™ Rapid Cement**. Traffic was diverted to the adjacent lane starting at 8:00 p.m., so that the 12 x 15 ft. section of 9 to 11 in. thick concrete pavement could be sawcut into manageable sections.



By 1:00 a.m., the pavement had been removed so the site could be prepared. Workers installed a polyethylene vapor barrier to mitigate water intrusion from the substrate as well as act as a bond breaker between the adjoining slabs.



Placement of **GreatWhite™** began at 1:20 a.m. The mixer was calibrated off site prior to the placement.

Material was placed at a 5" slump to balance workability with desired strength development.



At 1:25 a.m., a vibrating screed was used to quickly strike off and level the concrete.

Ambient temperature during the placement was 55 to 60 °F (12 to 16 °C)



By 1:25 a.m., the **GreatWhite™** cement concrete placement was complete and finishing operations were underway.

The use of a volumetric mixer added a great degree of schedule flexibility and mix design accuracy. *There was no need to worry about the concrete arriving before the site had been prepared and also no delay waiting for the concrete truck if prep work went smoother and faster than expected.*



A grooving tool was applied to the surface of the **GreatWhite™** material as it reached initial set. This step was completed at 2:00 a.m., - 40 minutes after placement of **GreatWhite™**

The repaired section of highway achieved sufficient strength to be re-opened to traffic by 4:00 a.m., - two hours after placement.
(CALTRANS officials elected to re-open highway at 6:00 a.m.)

Contact CERATECHs Engineering Team for additional Case Study information: 888-341-2600

Case Study:

Critical Airport Infrastructure Repair

Philadelphia International Airport
October 2008



In October of 2008, Philadelphia International Airport undertook a taxiway lighting upgrade project.

Stringent project specifications called for a concrete that could achieve compressive strengths greater than 3,600 psi in three hours as well as in ambient temperatures ranging from 30 - 50 degrees Fahrenheit.



CERATECH's GreatWhite™ Rapid Cement was chosen as the only material capable of satisfying the high early strength requirements of this project.



The successful use of GreatWhite™ Rapid Cement on this taxiway lighting project prompted Philadelphia International Airport officials to specify CERATECH's material for a 3,000 yard runway rehabilitation project.



GREEN Sustainable Construction Technology!

Protect our atmosphere, eliminate landfilling and preserve our natural resources!

CERATECH's revolutionary cement technology utilizes over 90% reclaimed industrial and post consumer waste products and a green sustainable admixture chemistry to produce an ultra high performance structural concrete.

CERATECH's "green" cement technology diverts waste streams away from landfills, produces little to no CO² from its manufacturing process and does not require the mining of virgin natural resources as Portland cement does.

Did You Know?

The US Environmental Protection Agency estimates that 8 - 10% of all human generated CO² is directly related to the manufacturing of Portland cement.

Roughly one ton of harmful greenhouse gas or CO² is generated for every three cubic yards of Portland cement concrete produced.



CERATECH is a member of the United States GREEN Building Council

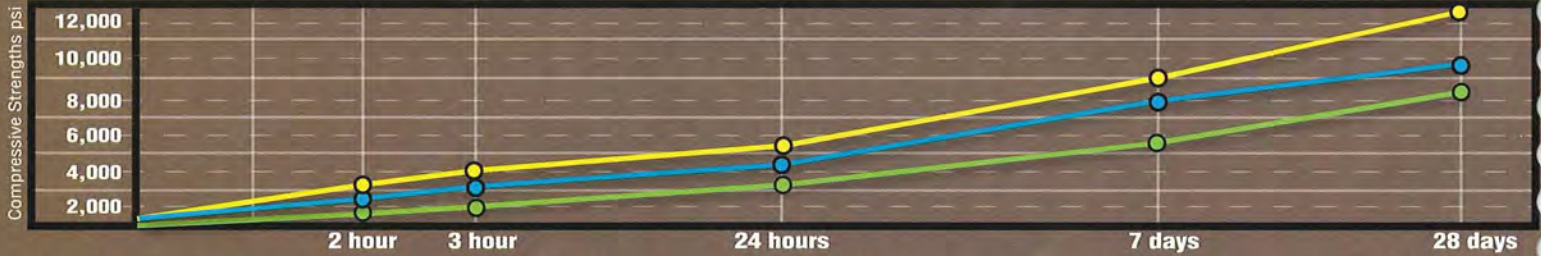




Technical Data

* Available in 75 pound plastic bags or 2,200 pound Super Sacks.

* GreatWhite™ Liquid admixture available in 270 gallon plastic totes or 55 gallon drums.



Performance Data

● 528 Lb. Cement/Cu. Yard ● 715 Lb. Cement/Cu. Yard ● 795 Lb. Cement/Cu. Yard ASTM Test Method

Property	528 Lb. Cement/Cu. Yard	715 Lb. Cement/Cu. Yard	795 Lb. Cement/Cu. Yard	ASTM Test Method
Compressive Strengths psi (From introduction of GreatWhite™ admixture)				
2 hours	1559	2800	3203	C39
3 hours	1843	3230	3640	C39
24 hours	3116	4550	5200	C39
7 days	5307	7540	9000	C39
28 days	8135	9830	12,498	C39
Flexural Strengths psi				
2 hours	>279	>350	>400	C78
3 hours	292	374	422	C78
28 days	688	980	1,160	C78
Tensile Strengths psi				
28 days	780	780	780	C496
Scaling Resistance lbs/ft²				
50 Cycles	0	0	0	C672
Modulus Of Elasticity (MoE)				
28 days	5.4	5.4	5.4	C469
Coefficient of Thermal Expansion millionth / F				
28 days	4.7	4.7	4.7	(AASHTO) TP-60
Length Change, % of Total length 28 days soak / 28 days dry				
28 days	-0.0300 / -0.0100	-0.0300 / -0.0100	-0.0300 / -0.0100	C157
Rapid Freeze Thaw Resistance (Durability Factor - Retained Percentage of Dynamic Modulus)				
300 Cycles	100%	100%	100%	C666A
Set Times @72°F/22°C				
Initial (Working Time)	20 - 30 min.	20 - 30 min.	20 - 30 min.	
Final	30 - 40 min.	30 - 40 min.	30 - 40 min.	
Load Bearing Strengths				
Wheeled Traffic	3.5 - 4 hours	2 hours	< 2 hours	

Mix designs shown are comprised of #67 coarse aggregate, 1.5 - 3% air entrainment and have slumps of 4 - 5"

Test data derived from internal CERATECH analysis and various state DOT testing labs, including CALTRANS, TXDOT

Visit CERATECH's comprehensive website www.ceratechinc.com for product data, video and other rapid repair and new construction product solutions.

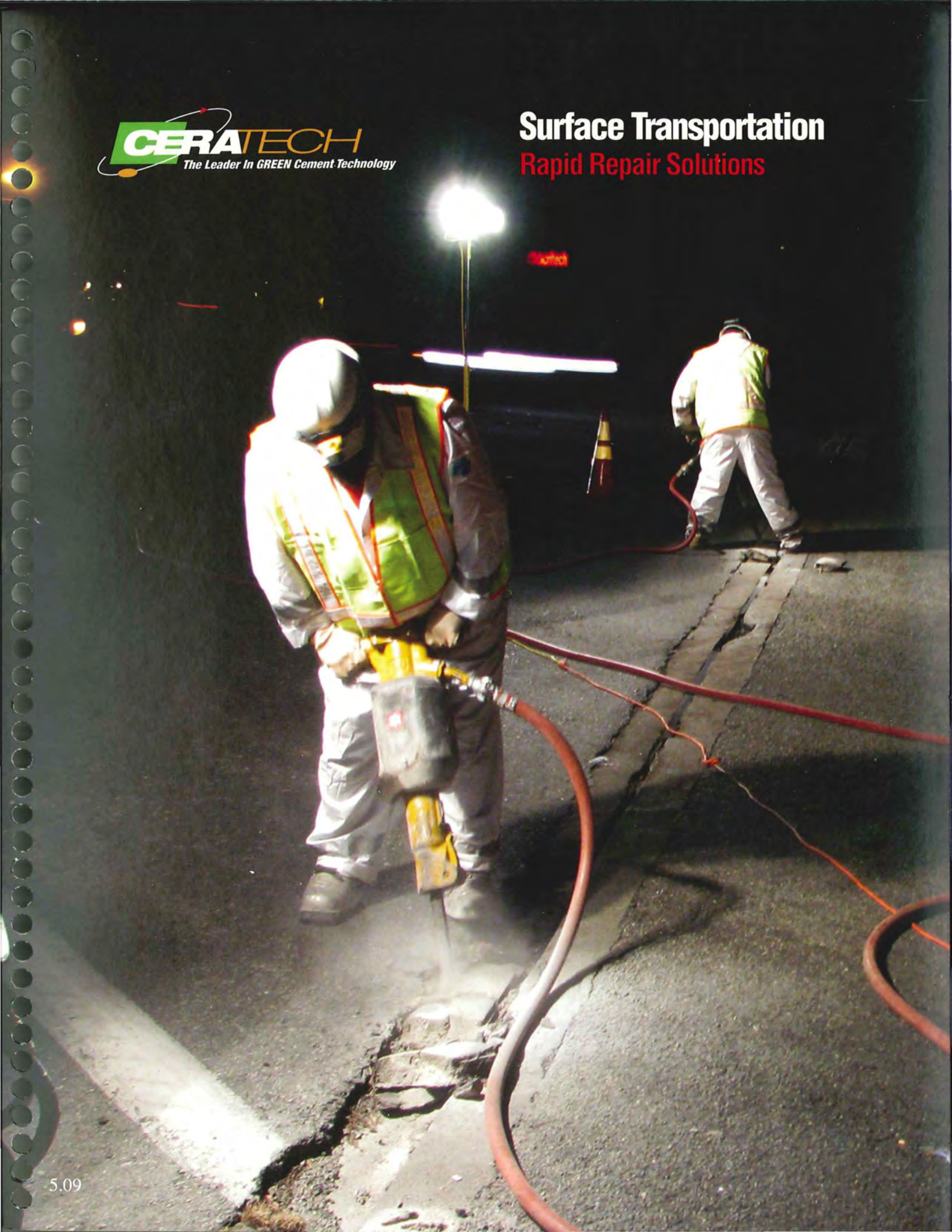
Call 1-800-581-8397 for sales east of the Mississippi / Call 1-800-708-7963 for sales west of the Mississippi



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Surface Transportation Rapid Repair Solutions



Introduction

CERATECH designs, manufactures and supplies highly engineered "green sustainable" non-Portland cement based, concrete repair products that facilitate **RAPID RETURN TO SERVICE** of critical infrastructure assets.

CERATECH's rapid repair products are *extremely green friendly*, easy to use and provide for extended repair life cycles, *thereby greatly reducing overall maintenance costs.*

All of **CERATECH's** products are corrosion resistant and possess low permeability characteristics making them less susceptible to chloride, sulfate and chemical attack. **CERATECH** products are highly durable, resisting scaling and damage in freeze thaw environments.

Minimize loss of revenue, downtime to critical assets and hazardous exposure to traffic with CERATECH's revolutionary family of rapid repair products!



Applications:

Armor / Header Joints

Bridge Decks

Runways, Taxiways

Pre Cast Repair

Full & Partial Depth Slab Replacement

Grouting / Mud Jacking

Form & Pour

Post Tension Caps

Cast In Place

Curb & Gutters

Impact Damage

Joint Spalls

"Green" Material Technology

CERATECH's "triple green" material technology was born over ten years ago in an effort to develop commercially viable concrete repair materials from an assortment of industrial waste streams. Our proprietary blend of inert minerals and various waste streams yield a non-traditional cementitious material, possessing a highly flexible base chemistry with *extremely unique* performance and application advantages. Revolutionary product characteristics provide end users with a value added "green solution" for today's most challenging rapid transportation repair applications.



GREEN CONSTRUCTION TECHNOLOGY!

CERATECH
The Leader In GREEN Cement Technology

Product Characteristics

- **High early strengths** - Allowing for quick return to service of critical assets
- **Stable dimensional characteristics** - For permanency of repairs
- **Easy to mix, place, finish & texture** - Water mix and clean-up
- **Non-hazardous** - Green sustainable material
- **Can be applied in ambient temperatures from minus 20°F to above 160°F** - With no degradation of long term performance characteristics. (Product dependant)
- **Bonds tenaciously to multiple materials** - Without the need for a primer or bond coat.
- **Self-Curing** - Does not require moist curing, tenting in cold applications or cooling in high temperatures.

Product Benefits

- **Non-shrink & shrinkage compensated options**
- **Exceptional sustained bond strengths** (slant shear and direct tension)
- **Low coefficient of thermal expansion (CTE)**
- **Mild modulus of elasticity (MOE)**
- **Very low permeability**- Highly resistant to sulfate, chloride and chemical attack
- **High resistance to freeze thaw damage**
- **Exceptional durability**- Highly resistant to scaling & abrasion
- **Temperature Tolerant**- Applicable from -20°F to 160°F (Product dependant)
- **Exceptional cohesiveness**

High Performance, Turn-Key Structural Concrete!

D.O.T.Line™ & Mainline™ Rapid Repair Concretes were specifically engineered to provide for an **environmentally friendly, economical & turn-key solution** to real world repairs of critical infrastructure.

D.O.T.Line™ & Mainline™ are semi-leveling, high performance structural repair concretes with 25 and 35 minutes of working time respectively and **will reach compressive strengths of more than 2,500 psi in just 2 hours (D.O.T.Line™) and 4 hours (Mainline™) from the addition of water, not final set - enabling rapid "Return To Service" to traffic, toll revenue and most importantly, highway worker safety.**

D.O.T.Line™ & Mainline™ can be mixed using standard equipment and can be placed in a wide ambient temperature range from 30 to 120 degrees Fahrenheit. There is no learning curve as with other repair products and can be safely handled without skin irritations or chemical burns. **Superior bond strengths make for durable, cost effective repairs to vital transportation surfaces.**



pavemend[®]

21st Century Concrete Repair

**Extreme Environments
Extreme Flexibility
Extremely Easy!**

**Perfect for Cold
Weather Repairs!**

pavemend SLQ[®]

**Semi-Self
Leveling
VERY RAPID
Repair Mortar**
Trowelable &
Extendable

- 3 - 5 minutes working time @72°F
- 1 hour return to service (> 3,400 psi)
- Applicable from 0°F /-17°C to 90°F /32°C
- Extendable up to 100% by weight with 3/8" (1cm) or 1/2" (1.3cm) clean washed fractured stone
- 46 lb. (20.8 kg) 5 Gallon / 19L Bucket
- Yield (Neat) 0.42 ft³ / .012m³
- Yield (Extended 100%) 0.80 ft³ / .022m³



**Ideal for
grouting precast
components!**

pavemend TR[®]

**Semi Leveling
RAPID
Repair Mortar -**
Trowelable
Extendable

- 25 - 30 minutes working time @ 72°F
- 3 hour return to service (>3,000 psi)
- Applicable from 40°F /4°C to 120°F /49°C
- Extendable up to 100% by weight with 3/8" (1cm) or 1/2" (1.3cm) clean washed fracture stone
- 47 lb. (21.3 kg) 5 Gallon / 19L Bucket
- Yield (Neat) 0.43 ft³ / .012m³
- Yield (Extended 100%) 0.80 ft³ / .022m³
- Can be returned to a gel state by re-mixing with drill and paddle

pavemend 15.0[®]

**Self Leveling
RAPID
Repair Mortar**

- 7 - 9 minutes working time @72°F
- 2 hour return to service (>2,500 psi)
- Applicable from 30°F /-1°C to 110°F /43°C
- 45 lb. (20.4 kg) 5 Gallon 19L Bucket
- Yield (Neat) 0.42 ft³ / .012m³
- *Ideal for pre-cast grouting*

pavemend VR[®]

**Vertical &
Overhead
RAPID
Repair Mortar**

- 15 - 30 minutes working time @ 72°F
- Applicable from 40°F /4°C to 100°F /37°C
- 17 lb. (7.7 kg) 2 Gallon / 7.6L Bucket
- Yield (Coverage)
 - @ 0.25" profile = 7.4 ft²
 - @ 0.50" profile = 3.7 ft²
 - @ 1.00" profile = 1.9 ft²
 - @ 4.00" profile = 0.48 ft²
- Can be returned to a gel state by re-mixing with drill and paddle

The US Department of Defense (DOD) makes extensive use of CERATECH's Pavmend[®] brand of high performance concrete repair products from the Korean peninsula to Afghanistan, Iraq and the US mainland addressing a myriad of challenging rapid infrastructure repairs.

All Pavemend[®] Rapid Repair products are single component powders that are water activated.

go home early with

pavemend[®]

21st Century Concrete Repair

Vertical & Overhead RAPID Repair Mortar

ULTRA High Performance Concrete Repair!

CERATECH, The Leader in Environmentally Friendly GREEN Cement Technology has re-revolutionized urgent infrastructure repair with Pavemend SL® its latest and most advanced cement technology to date!

Pavemend SL® offers *unparalleled:*

High Early Strengths
Mechanical Properties
Ease of Use
Environmental Advantages

VALUE!



Pavemend SL® is a cementitious, rapid setting, semi-leveling, pre-extended structural repair concrete. It is a single component powder that is water activated. **Pavemend SL®** has 15 to 20 minutes of working time and *will reach compressive strengths of more than 2,600 psi within 90 minutes (from the addition of water) and more than 9,300 psi at 28 days.* Designed for use in horizontal and near horizontal repair applications, **Pavemend SL®** can be applied in ambient temperature ranges from 30 to 120 degrees Fahrenheit. **Pavemend SL®** can be mixed in a bucket with drill and paddle, a grout or concrete mixer and cleans up easily with water.

RECOMMENDED USES: Pavemend SL® is an ideal rapid repair material for roads and bridges, airport runways, warehouse or manufacturing facility floors, post-tension cable repairs and form & pour projects.

Compressive Strengths

1.5 hours.....	2,668 psi
2 hours.....	3,141 psi
24 hours.....	6,392 psi
7 days.....	8,269 psi
28 days.....	9,392 psi

Test results from a licensed 3rd party laboratory. See back page for additional performance data.



Independent 3rd Party Product Performance Results

Applicable Standard C928 for Rapid Hardening Cementitious Materials for Concrete Repair

5.18.09

Compressive Strengths psi								ASTM Test Method
1 Hours	3453 ■							C109/C39
1.5 Hours					2668 ■			C109/C39
2 Hours		2700 ■			3141 ■	2820 ■		C109/C39
3 Hours	3966 ■	3870 ■	3000 ■■	2700 ■				C109/C39
4 hours				2960 ■			3010 ■	C109/C39
24 Hours	4090 ■	4230 ■	5352 ■■	3310 ■	6392 ■	6115 ■	4905 ■	C109/C39
7 days	5630 ■	5570 ■	6147 ■■	4290 ■	8269 ■	9345 ■	7415 ■	C109/C39
28 days	7483 ■	6300 ■	7114 ■■	7780 ■	9392 ■	10510 ■	9730 ■	C109/C39
Bond Strengths psi								
1 day	2646 ■	1100 ■	1270 ■■	1620 ■	2265 ■	1960 ■	2503 ■	C882
7 days	2866 ■	2000 ■	1930 ■■	2280 ■	3010 ■	2745 ■	3056 ■	C882
Flexural Strengths psi								
7 days	600 ■	680 ■	620 ■■	720 ■	1220 ■	945 ■	1030 ■	C78
28 days	930 ■	910 ■	1500 ■■	730 ■	1270 ■	1405 ■	1105 ■	C78
Tensile Strengths psi								
7 days	195 ■	240 ■	230 ■■					C496
28 days	386 ■	345 ■	450 ■■	400 ■	515 ■	590 ■	590 ■	C496
Scaling Resistance lbs/ft²								
50 Cycles	0 ■	0 ■	0 ■■	0 ■	0 ■	0 ■	0 ■	C672
Modulus Of Elasticity millionsth / psi	(A Mild Modulus of Elasticity Contributes To Long Term Compatibility With Concrete Host)							
28 days	1.7 ■	3.3 ■	2.77 ■■	3.17 ■	4.02 ■	5.2 ■	4.7 ■	C469
Coefficient of Thermal Expansion millionsth / F								
28 days	2.95 ■	2.82 ■	2.52 ■■	2.01 ■	1.43 ■	1.32 ■	1.37 ■	(AASHTO) TP-60
Length Change, % of Total length 28 days soak / 28 days dry								
28 days	0.0085 / -0.0460 ■	0.0085 / -0.0595 ■	0.0085 / -0.002 ■■	-0.001 / -0.001 ■	-0.024 / -0.042 ■	-0.052 / -0.041 ■	-0.052 / -0.057 ■	C157
Rapid Freeze Thaw Resistance (Durability Factor - Retained Percentage of Dynamic Modulus)								
300 Cycles	99.6 % ■	99.6 % ■	100 % ■■	100 % ■	100 % ■	100 % ■	100 % ■	C666A
Set Times @72°F/22°C								
Initial (Working Time)	4 - 6 min. ■	7 - 9 min. ■	10 - 15 min. ■	15 - 20 min. ■	15 - 20 min. ■	20 - 30 min. ■	30 - 35 min. ■	
Final	6 - 8 min. ■	12 - 15 min. ■	25 - 35 min. ■	25 - 30 min. ■	25 - 35 min. ■	30 - 40 min. ■	45 - 60 min. ■	
Return To Service Time from addition of water								
Foot Traffic	28 min.	35 min.	1.5 hours	1.5 hours	45 min.	1 hour	2 hours	
Wheeled Traffic	1.1 hour	2.25 hours	3 hours	3 hours	1.5 hours	2 hours	3 hours	

● Test Results provided by Froehling and Robertson ■ Test Results provided by Penniman & Browne

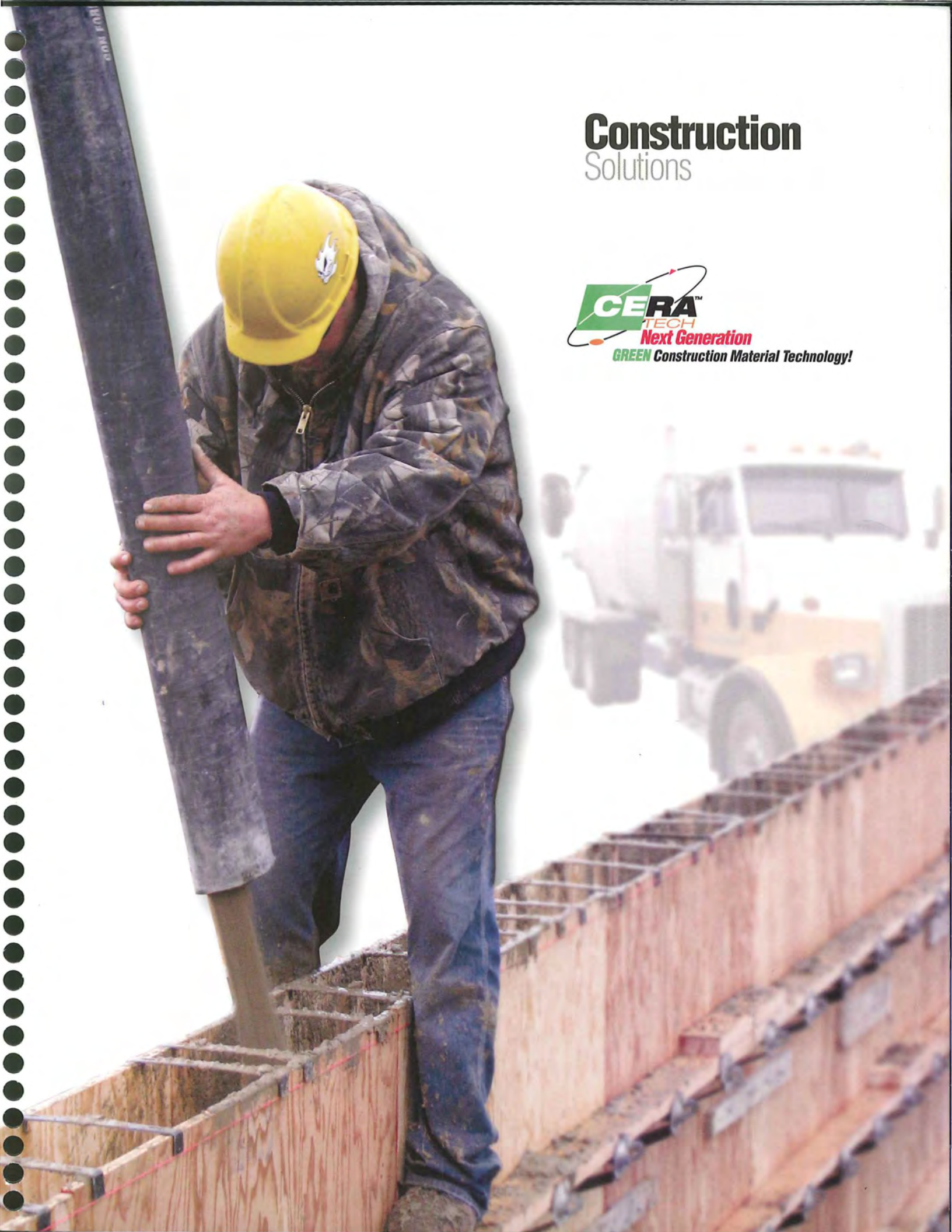
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Construction Solutions

CERA™
TECH
Next Generation
GREEN Construction Material Technology!



Ready Mix Suppliers and General Contractors!

Accelerate your business with CERATECH's revolutionary, ultra-high performance, engineered **"green"** cement technology!

Competitive advantages never before possible are now a reality!

- **Fast-Track** project time lines!
- **Increase project profitability** by minimizing labor and equipment costs!
- Obtain **"Green" building credits** and tax advantages!
- Offer a unique, high performance, Portland alternative "Ready Mix" product **that's 95% green!**
- **Eliminate wasted product costs** due to 90 minute **"water to discharge"** constraint.
- Strip formwork and begin vertical construction on footings **in as little as 4 hours!**
- **Tilt-up wall construction in 24 - 48 hours!**
- **Flexible** mix designs!
- **Six hour transit time!!!**

▼ Typical Applications

- Footings
- Foundation Walls
- Knee Walls
- Slab on Grade
- Elevated Slabs
- Columns
- Caissons
- Poured Piles
- High Rise / Superstructure
- Underpinning
- Retaining Walls

CERATM
TECH
Next Generation
GREEN Construction Material Technology!

jetrok™

SPRAYABLE HI-STRENGTH MORTAR

High Strength, Rapid Cure One Part Shotcrete

- Faux architectural structures
- Beam & column repair
- Stabilize cliff & rock outcroppings
- Mines & tunnels
- Swimming pools
- Spall Repairs
- High Strength Bond Beams

CERATECH's single component cement binder technology provides for a superior strength mortar that can be sprayed onto most porous surfaces to create a *highly durable repair*. Jetrok™ can also be used for rapid build new construction projects.

Jetrok™ has 30 minutes of potlife and *will reach compressive strengths over 3,000 psi in under 4 hours with excellent adhesion to reinforcing steel.*



GATOR DIRT™

Environmentally Friendly High Strength Soil Stabilization

GATOR DIRT™ is an ideal material for increasing the load bearing capacity of in situ soils *minimizing or eliminating the expense of removing and replacing unsuitable soils*. Depending on the nature of existing soils, GATOR DIRT™ will increase the structural integrity by over 15%

- Road & highway sub grade strengthening
- Dust and FOD control
- Parking lots
- Building pads
- Encampments
- Landing zones

Available in 70 pound bags or 2,200 pound Super Sacks



RediMAX™

Fast Track Concrete

Roller Compacted Concrete (RCC)

CERATECH's RediMAX™ cement binder technology facilitates "Roller Compacted Concrete" by producing a tighter matrix that resists water intrusion and provides for a *smoother, more durable wearing surface*. Exceptional flexural and compressive strengths allow for better bridging of sub base voids and imperfections.

Compressive strengths over 3,000 psi in 24 hours!

Visit www.ceratechinc.com for up to the minute product information, case studies and product videos.


Call 1-800-581-8397 for sales east of the Mississippi

Call 1-800-708-7963 for sales west of the Mississippi

green
Design & Build With Masonry!

GERATECH's revolutionary "green" engineered cement technology is now available for masonry construction projects.

The **FORTRESS Extreme Masonry Construction System™** offers unparalleled strengths enabling superior masonry construction techniques.



! FORTRESS™ Extreme Masonry Grout & Mortar can dramatically increase wall strengths & productivity when used in conjunction with conventional Portland Cement based CMU's.

■ **Earn GREEN Credits!!!**

■ **Uses Recycled Consumer & Industrial Waste**

■ **12,000 psi CMU's !**

■ **11,000 psi Mortar !**

■ **10X Mortar Bond Strengths!**

■ **Very Low Permeability**


■ **Design / Build Taller Structures !**

■ **Grout Strengths To 12,000 psi !**

■ **Create Monolithic Structures !**

■ **Build "Shear" Walls !**

■ **Improved Fire Resistance**



! FORTRESS™ Extreme Masonry Grout & Mortar offer bond strengths to 11,000 psi!



CERA™
TECH

**Next Generation
GREEN Construction Material Technology!**

RediMAX™ is an ultra high performance structural concrete suitable for most traditional applications. It can be configured and delivered from a batch plant via transit truck, introduced into a transit mixer at your site with super sacks or prepared at an "on-site" batch plant for dump truck delivery projects. **Unlike Portland concrete however, RediMAX™ remains in an unreacted state until water and RediMAX™ admixture are introduced.** This benefit allows for improved scheduling flexibility, eliminating the possibility of material loss due to the standard 90 minute water to discharge constraint.

Once activated, **RediMAX™** has 90 minutes to be discharged, placed and finished. Depending on mix design, **high early compressive strengths of over 3,000 psi are possible within 6 hours!**

RediMAX™ can be *field adjusted* for required slump and working time.

Formwork can be stripped in 4 hours making **vertical masonry construction possible immediately thereafter.** Commercial steel construction can begin in only 6 hours from placement as compressive strengths will exceed 3,000 psi.

***RediMAX™** can be placed in ambient temperatures to **zero degrees Fahrenheit without cold weather admixtures or supplemental heat!**

(Strength development at very low temperatures may be delayed by approximately 25%.)

Low permeability offers enhanced corrosion resistance to reinforcing steel and less susceptibility to chloride, sulfate and chemical attack. **RediMAX™** is highly durable, resisting scaling and damage in freeze thaw environments.

Tilt-up wall construction in 24 - 48 hours!

RediMAX™ admixture being added to transit truck at jobsite



RediMAX™ is the ideal choice for remote projects due to its nearly unlimited transit window and on site activation.

RediMAX™
Fast Track Concrete

Compressive Strengths psi	20°F - 100°F	0°F - 40°F	ASTM Test Method
4 hours	2200 ○		C39
24 Hours	4340 ○	3630 ■	C39
7 days	7360 ○	4400 ■	C39
28 days	9370 ○	4960 ■	C39
Flexural Strengths psi			
7 days	712 ○	400 ■	C78
28 days	768 ○	410 ■	C78
Tensile Strengths psi			
28 days	750 ○	460 ■	C496
Scaling Resistance lbs/ft ²			
50 Cycles	0 ○	0 ■	C672
Modulus Of Elasticity			
28 days	5.00 ○	3.46 ■	C469
Coefficient of Thermal Expansion millionth / F			
28 days	4.7 ○	5.1 ■	(AASHTO) TP-60
Length Change, % of Total length 28 days dry cure			
28 days	-0.0100 ○	+0.0110 ■	C157
Rapid Freeze Thaw Resistance (Durability Factor - Retained Percentage of Dynamic Modulus)			
300 Cycles	100% ○	98% ■	C666A
Set Times @72°F/22°C			
Initial (Working Time)	45 - 60 min. ○	145 min. ■	
Final	90 min. ○	160 min. ■	
Load Bearing Strengths			
Foot Traffic	2 - 3 hours	8 -12 hours	
Wheeled Traffic	6 hours	18 hours	
Block Construction	4 - 6 hours	18 hours	
Steel Construction	12 - 24 hours	24 hours	

○ Test Results developed by internal CTI testing

Performance data Based on 750Lb. of Binder Per Cubic Yard of Concrete @ 72°F

■ Test Results developed by CTL

* Refer To CERATECH Product Data Sheets For Up To Date Performance Data

“Green” Material Technology

CERATECH's “triple green” material technology was born over ten years ago in an effort to develop commercially viable construction materials from an assortment of industrial waste streams. Our proprietary blend of inert minerals and various waste materials yield a non-traditional cementitious material, possessing a highly flexible base chemistry with *extremely unique performance and application advantages*. Revolutionary product characteristics provide end users with a value added “green solution” for today's most challenging construction applications.

