Product Data Sheet

GSA P/N: C1100

Pre-extended, Packaged
High Temperature
CONCRETE

Updated 4.20.11

1 General Characteristics

FireRok™ is a cementitious, high-early strength concrete that can be used either as a repair product or as a structural concrete. **Within 24 - 72 hours of placement, the product can be exposed to intermittent high temperature environments up to 1800ºF.** It can be blended in small volumes using a conventional drum mixer, and is also available in bulk for transit truck applications as well.

Recommended uses: FireRok™ has been designed for areas which are exposed to high temperatures either from an intermittent or a continuous heat source. This would include runway areas exposed to jet blast, HPUs, oven, and metal casting areas.

2 Additional Physical Properties

UNIT WEIGHT (with water, sand & aggregate)
152 lb/ft^3 (2434 kg/m^3)

SETTING TIME
Set Times at 72°F/22°C at 2" (5 cm) material depth
Initial set: 30 - 35 minutes
Final set: 45 - 60 minutes

VOLUME YIELD **(#8 - 3/8" fractured stone- included)**
Concrete (binder + sand + coarse agg. + H^2O) =
0.40ft^3 (.011m^3)

3 Specifications

Results provided by licensed engineering test laboratory and represent typical results from production materials. Actual results may vary from third party testing results; however, CERATECH's materials meet and/or exceed established internal quality control standards, (available upon request) . All samples were air cured.

Property	Results	Test Method
Compressive Strengths, **psi** (MPa)		
4 hours	**3010** (20.8)	**ASTM C 39**
1 day - 24 hours	**4905** (33.8)	**ASTM C 39**
7 days	**7415** (51.1)	**ASTM C 39**
28 days	**9730** (67.1)	**ASTM C 39**
Flexural Strength, **psi** (MPa)		
1 day - 24 hours	**490** (3.4)	**ASTM C 78**
7 days	**1030** (7.1)	**ASTM C 78**
28 days	**1105** (7.6)	**ASTM C 78**
Splitting Tensile Strength, **psi** (MPa)		
28 days	**590** (4.0)	**ASTM C 496**
Bond Strength, **psi** (MPa)		
1 day - 24 hours	**2503** (17.6)	**ASTM C 882**
7 days	**3056** (21.0)	**ASTM C 882**
Rapid Freeze Thaw Resistance (Durability Factor - Retained percentage of Dynamic Modulus)		
300 cycles	**100%**	**ASTM C 666A**
Scaling Resistance, **lbs/ft^2** (kg/m^2)		
50 cycles	**0**	**ASTM C 672**
Modulus of Elasticity, **msi** (GPa)		
28 days	**4.7** (31.8)	**ASTM C 469**
Coefficient of Thermal Expansion, **in/in/˚F**		
28 days	**1.37**	**AASHTO TP 60**
Length Change, **% of total length**		
28 days soak / 28 days dry	**-0.052 / -0.057**	**ASTM C 157**
Abrasion Resistance, **mm of wear**		
28 days	**0.17**	**ASTM C 944 (2005)**

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4 Site Preparation

Surfaces should be prepared in accordance with ICRI 03730, "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion." and / or ACI 546R-96 "Concrete Repair Guide". Concrete surfaces should be prepared by appropriate mechanical methods to obtain an exposed aggregate surface with a minimum surface profile of +/- 1/16" (1.5 mm) in accordance with ICRI 03732. Pre-existing coatings or surface treatments should be completely removed. Dry, clean, stable surfaces are required. Remove all standing water. Reinforcing steel should have no loose scale. **Surfaces of host concrete must be damp.**

5 Mixing Instructions

Standard Mixing Procedures (Rotating Drum Concrete Mixer)

- Pre-wet cement mixer with water then drain all water from mixer (away from repair area)
- Start mixer - Add Water - **FIREROK**™ requires a total of 2 quarts of water per 53.5 lb.unit. Initially, add-in only 1 quart of water. (**FIREROK**™ is a water to binder sensitive cement. NEVER use less than 2 quarts of water nor MORE THAN 2 1/8 quarts of water per 53.5 lb. unit of **FIREROK**™.)
- Add pre-determined units of **FIREROK**™ Mix for 1 minute
- Add - in remaining quart of water per 53.5 lb. unit of **FIREROK**™
- Mix for 6 additional minutes or 7 minutes total
- Pour all contents into repair area
- Clean mixer or repeat process for next batch

Notes:

1. In ambient temperatures, < 50˚F / 10˚C, use warm water between 70˚F/22˚C and 90°F/32°C
2. In ambient temperatures > 85˚F/ 29˚C, use cooler water between 50˚F/ 10˚C and 70°F/22°C
3. Working times will vary when mix water temperature's are outside of these recommendations
4. **Minimum recommended batch size is 2 units (Use 4 quarts of water for 2 bag batches)**

6 Packaging & Shelf Life

PACKAGING

53.5lb (24.3 kg) Plastic Bag

SHELF LIFE
1 year

STORAGE
Bags must be kept dry

7 Limitations

- Not recommended for placement in temps below 30˚F/-1˚C and above 120˚F/49˚C.
- Will not bond to polymers.
- Pumpable with proper precautions

8 Application & Finish

- Working times are influenced by surface temperature and repair profile. **Working time can be extended by adding CERATECH's Set Retarder Admixture to mix water. (See Set Retardant product data sheet for more information)**
- Working times are influenced by surface temperature and repair profile.
- Minimum profile thickness is 1.13" (3.2 cm). There are no restrictions to the depth of the repair profile.
- For best results, CERATECH recommends monolithic placement of repair materials. Maintain a minimum thickness of 1.00 inch if repair material must be layered. Material must also be layered before final set has been reached.
- Upon initial set, a broom finish can be applied. Upon final set, the material can be saw-cut, drilled, sanded and/or polished
- Do not re-temper. The addition of water to the surface of the repair will negatively affect the materials final properties.
- General loading in 3 hours for wheeled traffic and 2 hours for foot traffic after addition of water.
- All previously existing joints must be re-established within 4 hours of final set.
- Self-curing, (Protect with blankets or equivalent in ambient temperatures below freezing (32˚F / 0˚F).
- Clean all tools and equipment with water prior to the material reaching final set.

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8 Safety

- See **Material Safety Data Sheet (MSDS)**.
- This document does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.
- Dispose of water and materials in accordance with Federal, State and Local regulations.
- The use of a dust mask, safety goggles and gloves is recommended.
- Keep out of the reach of children.

To Ensure Performance
Attention!

Read All Mixing Instructions Prior To Using!

Repair Area Must Be Clean & Mechanically Sound

Step by Step - Concrete Mixer & Placement Instructions

! A Minimum 2 bag batch is recommended **! Surfaces of host concrete must be damp**

1 Pre-wet mixer with water then drain as shown

DO NOT drain into repair site!

2 Start mixer turning

3

! Use 4 quarts of water for 2 bag batches

One 53.5 lb. unit of Firerok™ requires a total of 2 quarts of water.
Add water - initially, add in only 1 quart of water per 53.5 unit of Firerok™ to be used.

! (Firerok™ is a water to binder sensitive cement. NEVER use less than 2 quarts of water nor MORE THAN 2 1/8 quarts of water per 53.5 lb.unit of Firerok™.)

Increase water towards 2 1/8 quarts in temperatures above 85˚F / 29˚C

4

With mixer still turning, add pre-determined units of Firerok™
Mix for 1 minute

Add-in remaining quart of water per 53.5 pound unit of Firerok™

5

Mix for 6 additional minutes and place.

Pour Firerok™ into repair site.
Screed and finish
DO NOT RE-TEMPER WITH WATER.

6

Clean mixer or add water for next batch

! In ambient temperatures less than 50˚F /10˚C, **use warm water between 70˚F /** 22˚C **and 90˚F /** 32˚C**.**
In ambient temperatures greater than 85˚F / 29˚C, **use cool water between 50˚F /**10˚C and **70˚F** /22˚C.
Working times will vary when mix water temperatures are outside of these recommendations.

! A Bond release agent should be utilized on any forms should they be used

WARRANTY:
CERATECH, Inc. ("CERATECH") warrants that its products are free from defects in materials and workmanship. If any CERATECH product fails to conform to this warranty, CERATECH will replace the product at no cost to the buyer or refund the purchase price, at CERATECH's election. Any warranty claim must be made within one (1) year from the date of the shipment of the product to the buyer. In no event shall CERATECH be liable to the buyer for any consequential or incidental damages of any nature. CERATECH MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WRITTEN OR ORAL AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF ITS PRODUCTS AND EXCLUDES THE SAME. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

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