GSA P/N: C900 5 Gallon

Product Data Sheet

Semi Leveling / Trowelable / Extendable

VERY RAPID REPAIR MORTAR

Updated 6.8.10

1 General Characteristics

Subzero™ is a cementitious, rapid setting, ***semi-leveling*** structural repair mortar with a gel state consistency sufficient for trowelling up sloped grades and for aggregate extension. It is a single component powder that is water activated.

Subzero™ has 10 to 15 minutes of working time and ***will reach compressive strengths of more than 3,000 within 4 hours of final set at -10˚F. Subzero***™ ***can be applied in ambient temperature ranges from -20 to +40 degrees Fahrenheit***.

RECOMMENDED USES: SubZERO™ is an ideal material for repair of cold storage warehouses, freezers or other extreme cold temperature internal or external applications.

2 Additional Physical Properties

UNIT WEIGHT (NEAT)

115 lb/ft³ (1842 kg/m³)

SETTING TIME

Set Times at 20°F/-7°C at 1" (2.54 cm) material depth
Initial set: 5 - 7 minutes
Final set: 9 - 12 minutes

VOLUME YIELD

NEAT:
0.42 ft³ (0.012 m³) per 46 lb. (20.9 kg) unit
0.12 ft³ (0.003 m³) per 11 lb (4.99 kg) unit

Extended 50% w 3/8" pea gravel or 1/2" stone:
0.60 ft³ (0.017 m³) per 46 lb. (20.9 kg) unit
0.15 ft³ (0.004 m³) per 11 lb (4.99 kg) unit

Extended 75% w 3/8" pea gravel or 1/2" stone:
0.72 ft³ (0.02 m³) per 46 lb. (20.9 kg) unit
0.18 ft³ (0.005 m³) per 11 lb (4.99 kg) unit

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	NEAT 2" Cubes	Extended 3/8" pea gravel 4" Dia. x 8" Cylinders	Test Method
Compressive Strengths, **psi** (MPa)			
1 hour	**3280** (22.6	**2656** (18.3)	ASTM C 109 / ASTM C 39
3 hours	**3790** (26.1)	**3841** (26.5)	ASTM C 109 / ASTM C 39
1 day - 24 hours	**5020** (34.6)	**4524** (31.2)	ASTM C 109 / ASTM C 39
7 days	**6010** (41.4)	**TBD**	ASTM C 109 / ASTM C 39
28 days	**6090** (41.9)	**TBD**	ASTM C 109 / ASTM C 39
Flexural Strength, **psi** (MPa)			
7 days	**698** (4.8)	**TBD**	**ASTM C 78**
28 days	**921** (6.3)	**TBD**	**ASTM C 78**
Splitting Tensile Strength, **psi** (MPa)			
7 days	**284** (1.9)	**TBD**	**ASTM C 496**
28 days	**318** (2.2)	**TBD**	**ASTM C 496**
Bond Strength, **psi** (MPa)			
1 day - 24 hours	**1874** (12.9)	**TBD**	**ASTM C 882**
7 days	**2722** (18.7)	**TBD**	**ASTM C 882**
Scaling Resistance, **lbs/ft²** (kg/m²)			
25 cycles	**0** (0)	**NTBT**	**ASTM C 672**
Modulus of Elasticity, **msi** (GPa)			
28 days	**3.4** (23.0)	**TBD**	**ASTM C 469**
Coefficient of Thermal Expansion, **in/in/˚F**			
28 days	**2.95**	**NTBT**	**AASHTO TP 60**
Length Change, **% of total length**			
28 days soak / 28 days dry	**-0.023 / -0.0430**	**NTBT**	**ASTM C 157**

1 3rd party test results
2 Internal test results

*** NTBT - Not to be tested**

*** To be determined**

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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 NEAT Procedures (Bucket Mixing with Drill & Paddle)

- Loosen material by tumbling bucket & dry mixing ***before*** adding water.
- To ensure product performance, **DO NOT divide or separate individual units into smaller portions. MIX ENTIRE CONTENTS AT ONE TIME.**
- A drill (6 amp minimum) with a mixer blade turning at least 500 to 800 rpm is required. Drills with speeds greater than 800 RPMs may entrain air in the mix.
- **DO NOT HAND MIX**
- To begin the mixing process, add the proper amount of water:

For Each:	**Add:**
46 lb (20.9 kg) 5 gallon (18.9 L) bucket	1 U.S. gallon (3.8 L) of water
11lb (4.99 kg) 2 gallon (7.6 L) bucket	1 U.S. quart (.95 L) of water

- Ideal water temperature is between 65°F/18°C and 75°F/24°C.
- ***After adding the water, it is very important to rapidly incorporate all of the dry SubZERO™ powders into water to achieve a uniform wet mixture within the first 30 seconds of mixing.*** Continue mixing per instructions below.

For Aggregate Extension: (Bucket Mixing with Drill & Paddle)

- Use only 3/8" (1 cm) clean washed pea gravel or 1/2"(1.3cm) #7 stone up to 75% or 35 lbs. maximum by weight.
- ***Add aggregate to material and water slurry after mixing for 30 seconds***. Continue mixing per instructions below.

Mixing Notes:

1. SubZERO™ undergoes an exothermic chemical reaction during blending. Heat, the by-product of the reaction, is the best indication that the reaction is complete and that the product is ready to be poured. **SubZERO™ has a Critical Mix Temperature of 85˚F/29˚C which MUST BE REACHED before placing to obtain optimum performance.** *(In cold weather, it may be impossible to reach the Critical Mix Temperature, therefore a 40˚F/22˚C rise in material temperature is mandatory to ensure that the necessary chemical reactions have taken place to deliver the desired performance characteristics);* Mixing time to reach the **Critical Mix Temperature** will vary with ambient air and mix water temperatures, however, **never mix SubZERO™ for less than 2 minutes.** It is recommended that a thermal gun or temperature probe be used to ensure that the **Critical Mix Temperature** has been achieved.

6

PACKAGING

46 lb (20.9 kg) 5 gallon (18.9 L) bucket
11lb (4.99 kg) 2 gallon (7.6 L) bucket

SHELF LIFE

Buckets - 3 years (when stored in original unopened bucket)

Packaging & Shelf Life

STORAGE

Buckets are environmentally sealed and require no special storage requirements

7 Limitations

- Not recommended for surface temperatures above **40˚F**/4˚C or below **-20˚F**/ -29˚C .
- Will not bond to polymers.
- Pumping not recommended.
- Must be mixed with drill and paddle, **cannot be mixed in grout mixer. and/or rotating drum concrete mixers due to rapid set times.**
- Repair profiles less than 0.5" thick.

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 infor mation)**
- Minimum NEAT profile thickness is **0.50"** (1.3cm). 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.
- 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 5 hours for wheeled traffic** in temperatures above 20˚F /-7˚C .In ambient and/or surface temperatures below 20°F/- 7°C, extend the loading time (Return to Service) by 30 minutes for each 10° below 20°F/-7°C.
- **All previously existing joints must be re-established within 3-5 hours of final set depending on depth of repair profile.**
- Self-curing in ambient temperatures of **0˚F /-18˚C and above.**
- Protect repairs with blankets or equivalent for 4-6 hours in ambient temperatures **below 0˚F**/-18˚C.
- Clean all tools and equipment with water prior to the material reaching final set.

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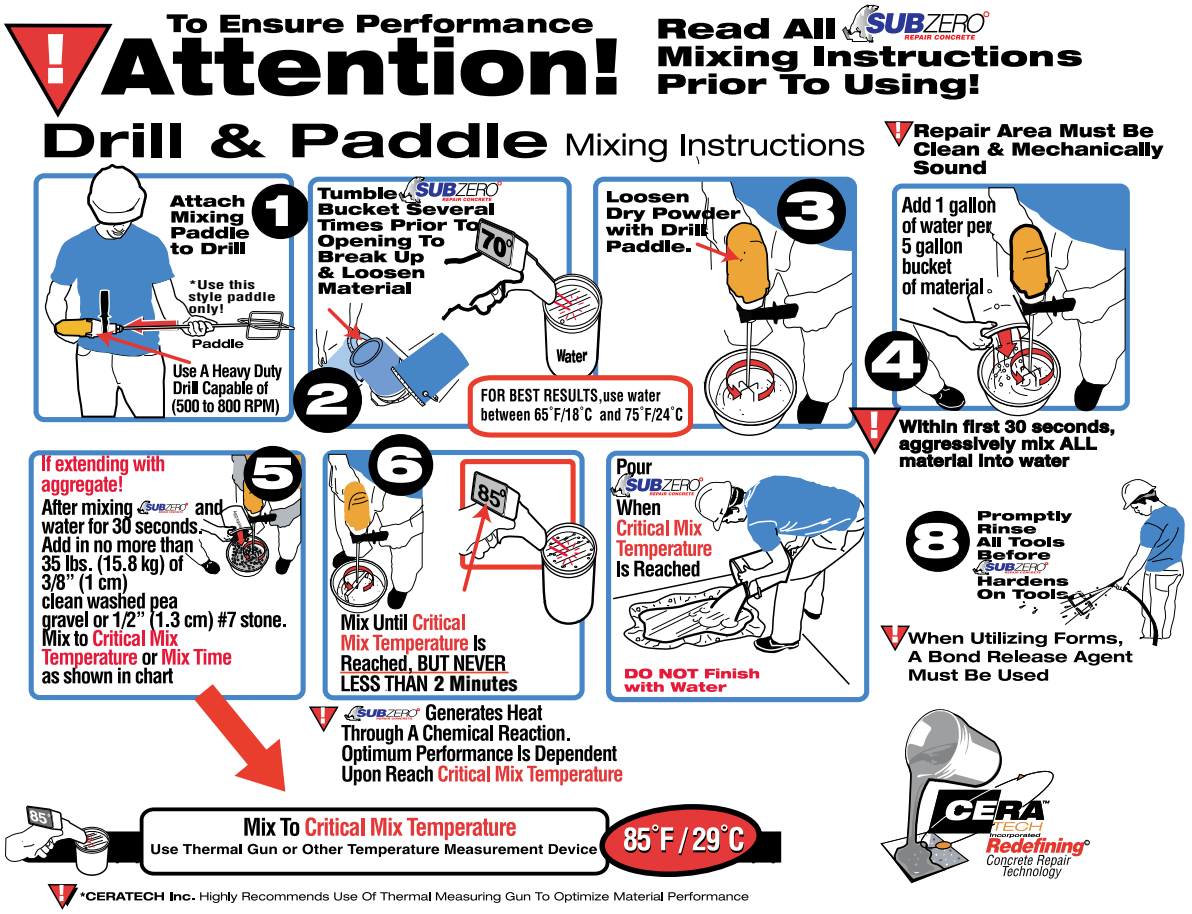
8 Safety

- 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.



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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