

Section 03620  
NON-SHRINK GROUTING

**PART 1 – GENERAL**

1.10 SUMMARY

- A. Provide non shrink, rapid setting, high strength repair mortar for horizontal structural patch and repair of existing concrete substrate.
- B. Provide high strength, non-metallic, Portland cement based non shrink grout.
- C. Related Sections: Other specification sections which relate directly to the work of this section include the following:

Section 03311: Cast-In-Place Concrete

1.20 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation for each material and product used. Include manufacturer's Material Safety Data Sheets.

1.30 REFERENCES

1. ASTM C 109: Compressive Strength of Hydraulic Mortars
2. ASTM C 191: Setting time of Hydraulic Cement
3. ASTM C 882: Slant Shear Bond Strength
4. ASTM C 928: Rapid Hardening Cementitious Materials for Concrete Repairs
5. ASTM C 939: Flow of Grout
6. ASTM C 1107: Hydraulic Cement Grout (Non Shrink)
7. Region III Test Method IV: Freeze/Thaw Testing
8. Utah D.O.T. Bond/Slant Shear Testing

1.40 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: The manufacturer shall be a company with at least fifteen years experience in the manufacturer and marketing of pre-packaged cementitious repair materials.
- B. Installer's Qualifications: The contractor shall be qualified to perform the work specified by reason of experience.

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#### 1.50 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.
- B. Store products in a dry area. Protect from direct sunlight.
- C. Handle products in accordance with manufacturer's printed recommendations.

#### PART 2 – PRODUCTS

##### 2.10 MATERIALS

A. Non Shrink rapid setting high strength, hydraulic cement based repair mortar and Non Shrink Grouts for horizontal applications. Comply with the following:

1. Manufacturer: **Fastset™ Non Shrink Grout** (#1585-09) as manufactured by the QUIKRETE® Companies, One Securities Centre, 3490 Piedmont Road, NE, Suite 1300, Atlanta, GA 30305; telephone (404) 634-9100 [www.quikrete.com](http://www.quikrete.com); OR EQUAL by **Rapid-Set™ High Strength Non-Shrink Grout**, CTS Cement Manufacturing Corp., 11065 Knott Avenue. , Suite A, Cypress, CA 90630, [www.rapidset.com](http://www.rapidset.com); or **Euclid Chemical Co.**, Cleveland, OH; [www.euclidchemical.com](http://www.euclidchemical.com) .

2. Performance and Physical Properties at 73 degrees F and 50 percent relative humidity:

- a. Compliance: ASTM C 928 R-3 specifications ASTM C 1107 CRD 621
- b. Working Time, ASTM C 1107: 15-20 minutes.
- c. Final Set Time, ASTM C 191: 20-45 minutes.
- d. Compressive Strength, ASTM C 109 Modified:

**Fluid:** 2000 psi (13.8 MPa) @ 3 hours, 4000 psi (27.6 MPa) @ 24 hours, 5000 psi (34.5 MPa) @ 7 days and **6500 psi** (44.8 MPa) @ 28 days.

**Flowable:** 2500 psi (19.2 MPa) @ 3 hours, 4500 psi, 4500 psi (31 MPa) @ 24 hours, 5500 psi (37.9 MPa) @ 7 days and **7500 psi** (51.7 MPa) @ 28 days.

**Plastic:** 3000 psi (20.7 MPa) @ 3 hours, 5000 psi (34.5 MPa) @ 24 hours, 6000 psi (41.3 MPa) @ 7 days and **8000 psi** (55.1 MPa) @ 28 days.

- e. Slant Shear Bond Strength, ASTM C 928: 1000 psi (6.9 MPa) @ 24 hours, 1500 psi (10.3 MPa) @ 7 days and 2500 psi (17.2 MPa) @ 28 days.

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f. Height Change, ASTM C 1090: 0-0.2%. g. Flow at Fluid Consistency, ASTM C 939: 20-30 seconds.

#### **PART 3 – EXECUTION**

##### 3.10 EXAMINATION

- A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.
- B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas landscaping from contact due to mixing and handling of materials.

##### 3.20 SURFACE PREPARATION: Comply with manufacturer's printed instructions and the following:

- A. Remove all spalled and unsound concrete from area to be repaired. If rusty reinforcing steel is present; it must be abrasive blasted to remove rust.
- B. Remove enough material to completely expose reinforcing steel.
- C. Large vertical or overhead patches deeper than 2" (50 mm) should contain reinforcing steel. An additional steel should be inserted using appropriate techniques, if none is present.
- D. Clean surface to be repaired of all materials including dust, oil, dirt and grease.
- E. Dampen with clean water before patching and remove standing water.

##### 3.30 MIXING: Comply with manufacturer's printed instructions and the following:

- A. Material should be mechanically mixed for a minimum of 3 minutes using a five gallon (19L) bucket with a ½" (12mm) drill and paddle mixer. For large grouting applications a standard mortar mixer should be used.
- B. Add 1 ¼ gallon (4.7L) of clean water for each 60lb (27.2 kg) bag to achieve a plastic consistency. (Flowable: 1½ gallon (5.7L), fluid 1¾ gal. (6.6L)). Add the powder to the water and mix to achieve required placing consistency. Add water sparingly to reach the desired consistency. Do not mix more material than can be placed in 15 minutes. C. For repair deeper than 2" (50 mm), up to 30 lbs (13.6kg) of clean, high quality ½" (12mm) gravel may be added to the mix at the plastic consistency. The water required will be reduced to 1 gallon (3.8 L) per 60-pound (27.2 kg) bag. D. Do not re-temper with additional water.

##### 3.40 APPLICATION: Comply with manufacturer's printed instructions and the following:

- A. Instructions for use as a Grout

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1. The area to be grouted should be thoroughly flushed and soaked with clean water prior to grouting. Leave no standing water.
2. Place the grout quickly and continuously use light rodding or strapping is permitted to eliminate air bubbles.
3. Grout temperature should be maintained from 50°F to 90°F (10°C - 32°C) to achieve specified results. Use cold water in hot weather or hot water in cold weather to achieve desired grout temperature. Do not use if temperature is expected to go below 32°F (0°C) within a 12 hour period.

#### B. Instructions for use as a Repair Mortar

1. Remove all areas of spalled and unsound concrete from surface to be repaired.
2. Repair areas that are subject to heavy traffic should have a vertical edge of ½" (12 mm) or more, formed by use of a pneumatic jackhammer or sawing.
3. Dampen surface with clean water before patching. Remove standing water.
4. The repaired areas should be filled by placing material full depth, from one end to the other to eliminate partial depth lifts between batches.
5. Consolidate the material by hand tamping or chopping with a shovel or trowel. This is particularly important around the edges.
6. Screed and finish to create a surface that matches the surrounding finish.
7. Repair Mortar temperature should be maintained from 50°F to 90°F (10°C - 32°C) to achieve specified results. Use cold water in hot weather or hot water in cold weather to achieve desired grout temperature. Do not use if temperature is expected to go below 32°F (0°C) within a 12 hour period.

#### 3.50 CURING

A. Grouting applications must be damp cured for at least one day. No special curing procedures are required for repair applications but sealing surface with QUIKRETE® Acrylic Concrete Sealer (No. 8800), OR EQUAL, after concrete has hardened will ensure proper curing and help prevent shrinkage cracking.

#### 3.60 CLEANING

A. Remove excess material before material cures. If material has cured, remove using mechanical methods that will not damage substrate.

END OF SECTION