



HIGH STRENGTH GROUT

High Strength Precision Nonshrink Grout

PRODUCT DESCRIPTION

Five Star® High Strength Grout is the industry's leading cement-based, nonmetallic, nonshrink grout for supporting machinery and equipment requiring precision alignment. It is formulated with Air Release technology that combines high performance with the greatest reliability. When tested in accordance with ASTM C 827, Five Star High Strength Grout exhibits positive expansion. Five Star High Strength Grout meets the performance requirements of ASTM C 1107-02 Grades A, B and C, ASTM C 1107-07, and CRD-C 621-93 specifications for nonshrink grout over a wide temperature range, 40°F - 90°F (4°C - 32°C).

ADVANTAGES

- Air release technology per ACI 351.1 R
- High 1, 7, and 28 day compressive strengths
- 95% Effective Bearing Area (EBA) is typically achieved following proper grouting procedures
- Provides placement versatility: pour, pump or dry pack
- Permanent support for machinery requiring precision alignment
- Does not contain gas generating additives, such as aluminum powder
- Nonshrink from the time of placement

USES

- Grouting of machinery and equipment under high load applications such as wind turbines to maintain precision alignment
- Nonshrink grouting of structural steel and precast concrete
- Grouting of anchors and dowels
- Support of tanks and vessels

PACKAGING AND YIELD

Five Star High Strength Grout is packaged in heavy-duty, polyethylene lined bags and is available in 44 lb (20.0 kg) units yielding approximately 0.41 cubic feet (11.6 liters) of hardened material at maximum water content.

SHELF LIFE

One year in original unopened packaging when stored in dry conditions; high relative humidity will reduce shelf life.

TYPICAL PROPERTIES AT 70°F (21°C)		
Early Height Change, ASTM C 827	0.0 to 4.0%	
Hardened Height Change, ASTM C 1090	0.0 to 0.3%	
Effective Bearing Area	95%	
Bond Strength, ASTM C 882 / 28 Days	2000 psi (13.8 MPa)	
Pull-out Strength, Shear Bond with #5 deformed bar, 7 days	2400 psi (16.6 MPa)	
Compressive Strength, ASTM C 942 (C109 Restrained)	Minimum Water	psi (MPa) Maximum Water
	1 Day	6000 psi (41.4 MPa) 5000 psi (34.5 MPa)
	7 Days	11000 psi (75.8 MPa) 8000 psi (55.2 MPa)
	28 Days	13000 psi (89.7 MPa) 10000 psi (69.0 MPa)
Working Time at 70°F (21°C)	20 minutes	

The data shown above reflects typical results based on laboratory testing under controlled conditions. Reasonable variations from the data shown above may result. Test methods are modified where applicable.

PLACEMENT GUIDELINES

- 1. SURFACE PREPARATION:** All surfaces in contact with Five Star® High Strength Grout shall be free of oil, grease, laitance and other contaminants. Concrete must be clean, sound and roughened to ensure a good bond. Soak concrete surfaces for 8 to 24 hours prior to application with liberal quantities of potable water, leaving the concrete saturated and free of standing water.
- 2. FORMWORK:** Formwork shall be constructed of rigid non-absorbent materials, securely anchored, liquid-tight and strong enough to resist forces developed during grout placement. The clearance between formwork and baseplate shall be sufficient to allow for a headbox. The clearance for remaining sides shall be one to two inches (25 - 50 mm). Areas where bond is not desired must be treated with form oil, paste wax or similar material. Isolation joints may be necessary depending on pour dimensions. Contact Five Star Engineering and Technical Center for further information.
- 3. MIXING:** Mix Five Star High Strength Grout thoroughly for approximately four to five minutes to a uniform consistency with a mortar mixer (stationary barrel with moving blades). A drill and paddle mixer is acceptable for single bag mixes. For optimum performance, maintain grout at ambient temperatures between 40°F and 90°F (4°C and 32°C). Use heated or chilled water to help adjust working time. Mix Five Star High Strength Grout with 3 to 4 quarts potable water per 44 lb. bag. Working time is approximately 20 minutes at 70°F (21°C). Follow printed instructions on the package. Always add mixing water first to mixer followed by grout.
- 4. METHODS OF PLACEMENT:** Five Star High Strength Grout may be dry packed, pumped or poured into place. Minimum placement thickness for Five Star High Strength Grout is one inch (25 mm). For pours over 6 inches (150 mm) in depth Five Star High Strength Grout should be extended with a clean damp coarse aggregate meeting the requirements of ASTM C 33. Refer to the Five Star Technical Bulletin "Cement Grout Aggregate Extension" for guidelines.
- 5. POST-PLACEMENT PROCEDURES:** Five Star High Strength Grout shall be wet cured for a minimum of three days, or coated with an approved curing compound meeting the requirements of ASTM C 309 after a minimum 24 hour wet cure. In-service operation may begin immediately after the required grout strength has been reached.

NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed placement procedures, refer to Design-A-Spec™ installation guidelines or call the Five Star Engineering and Technical Service Center at (800) 243-2206.

CONSIDERATIONS

- At time of placement, if temperatures of equipment and surfaces are not between 40°F and 90°F (4°C and 32°C), refer to Design-A-Spec™ for cold and hot weather grouting procedures or call the Five Star Engineering and Technical Service Center at (800) 243-2206.
- Never exceed the maximum water content as stated on the bag or add an amount that will cause segregation.
- Construction practices dictate concrete foundation should achieve its design strength before grouting.

CAUTION

Contains cementitious material and crystalline silica. International Agency for Research on Cancer has determined that there is sufficient evidence for the carcinogenicity of inhaled crystalline silica to humans. Take appropriate measures to avoid breathing dust. Avoid contact with eyes and contact with skin. In case of contact with eyes, immediately flush with plenty of water for at least 15 minutes. Immediately call a physician. Wash skin thoroughly after handling. Keep product out of reach of children. **PRIOR TO USE, REFER TO MATERIAL SAFETY DATA SHEET.**

For worldwide availability, additional product information and technical support, contact your local Five Star distributor, local sales representative, or you may call Five Star's Engineering and Technical Service Center at (800) 243-2206.

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