



FIVE STAR® GROUT

High Performance Precision Non-Shrink Grout
For Nuclear Safety Zone Applications

PRODUCT DESCRIPTION

Five Star® Grout is the industry's leading cement-based, nonmetallic, non-shrink grout for supporting machinery and equipment. 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® Grout exhibits positive expansion. Five Star® 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 non-shrink grout over a wide temperature range, 40°F - 90°F (4°C - 32°C). This specialized version of Five Star® Grout is compliant with NRC 10CFR50 Appendix B and ASME NQA-1 Quality Programs.

ADVANTAGES

- Air release technology per ACI 351.1 R
- 95% Effective Bearing Area (EBA) is typically achieved following proper grouting procedures
- Provides placement versatility: pour, pump or dry pack
- 45 minute working time
- Permanent support for machinery requiring precision alignment
- Does not contain gas generating additives, such as aluminum powder
- Non-shrink from the time of placement

USES

- Grouting of machinery and equipment to maintain precision alignment
- Non-shrink grouting of structural steel and precast concrete
- Grouting of anchors and dowels
- Support of tanks and vessels

PACKAGING AND YIELD

Five Star® Grout is packaged in heavy-duty, polyethylene lined bags and is available in 50 lb. (22.7 kg) units yielding approximately 0.5 cubic feet (14.1 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	2,000 psi (13.8 MPa)	
Pull-out Strength , Tension, #5 threaded bar, 7 Days	2,400 psi (16.6 MPa)	
Compressive Strength , ASTM C 942 (C109 Restrained)	Minimum Water psi (MPa)	Maximum Water psi (MPa)
1 Day	4,000 (27.6)	2,500 (17.3)
3 Days	5,500 (38.0)	3,500 (24.1)
7 Days	6,500 (44.9)	5,000 (34.5)
28 Days	8,000 (55.2)	6,500 (44.9)
Working Time at 70°F (21°C)	45 minutes	

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



PLACEMENT GUIDELINES

- SURFACE PREPARATION:** All surfaces in contact with Five Star® Grout shall be free of oil, grease laitance and other bond-inhibiting contaminants. Concrete should be mechanically roughened to coarse aggregate exposure to maximize bond. A Concrete Surface Profile (CSP) of 6-9 in accordance with ICRI Technical Guideline 310.2R is recommended. Presoak concrete surfaces for 8 to 24 hours, continuously and consistently, via wet rags, wet burlap, ponding or similar method.
- 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 Products' Engineering and Technical Center for further information.
- MIXING:** Mix Five Star® 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® Grout with 7 - 11 quarts potable water per 100 lb. bag (3-1/2 to 5-1/2 quarts per 50 lb. bag). Do not exceed maximum recommended amount of mixing water as stated on the package or add an amount that will cause segregation. Working time is approximately 45 minutes at 70°F (21°C). Follow printed instructions on the package. Always add mixing water first to mixer followed by grout.
- PLACEMENT PROCEDURES:** Five Star® Grout may be dry packed, poured or pumped into place. Minimum placement thickness for Five Star® Grout is 1 inch (25 mm). For pours over 6 inches (150 mm) in depth Five Star® Grout should be extended with a clean, damp coarse aggregate meeting the requirements of ASTM C 33. Refer to Five Star Products' Technical Bulletin "Cement Grout Aggregate Extension" for guidelines.
- POST-PLACEMENT PROCEDURES:** Five Star® 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 Five Star® Design-A-Spec™ installation guidelines or call Five Star Products' Engineering and Technical Service Center at 1-800-243-2206.

CONSIDERATIONS

- If temperatures of equipment and surfaces are not between 40°F and 90°F (4°C and 32°C) at time of placement, refer to Five Star® Design-A-Spec™ for cold and hot weather grouting procedures, or call Five Star Products' Engineering and Technical Service Center at 1-800-243-2206.
- 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 SAFETY DATA SHEET.**

For worldwide availability, additional product information and technical support, contact your local Five Star® distributor, local sales representative, or call Five Star Products' Engineering and Technical Service Center at 1-800-243-2206.

SKU/PRODUCT CODE	DESCRIPTION	#UNITS/PALLET	UNIT SIZE
25500N	Five Star® Grout for Nuclear Safety Zone	56	50 lb. (22.7 kg) Bag

Compliant with NRC 10CFR50 Appendix B and ASME NQA-1 Quality Programs

WARRANTY: "FIVE STAR PRODUCTS, INC. (FSP) PRODUCTS ARE MANUFACTURED TO BE FREE OF MANUFACTURING DEFECTS AND TO MEET FSP'S CURRENT PUBLISHED PHYSICAL PROPERTIES WHEN APPLIED IN ACCORDANCE WITH FSP'S DIRECTIONS AND TESTED IN ACCORDANCE WITH ASTM AND FSP STANDARDS. HOWEVER, SHOULD THERE BE DEFECTS OF MANUFACTURING OF ANY KIND, THE SOLE RIGHT OF THE USER WILL BE TO RETURN ALL MATERIALS ALLEGED TO BE DEFECTIVE, FREIGHT PREPAID TO FSP, FOR REPLACEMENT. THERE ARE NO OTHER WARRANTIES BY FSP OF ANY NATURE WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IN CONNECTION WITH THIS PRODUCT. FSP SHALL NOT BE LIABLE FOR DAMAGES OF ANY SORT, INCLUDING PUNITIVE, ACTUAL, REMOTE, OR CONSEQUENTIAL DAMAGES, RESULTING FROM ANY CLAIMS OF BREACH OF CONTRACT, BREACH OF ANY WARRANTY, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR FROM ANY OTHER CAUSE WHATSOEVER. FSP SHALL ALSO NOT BE RESPONSIBLE FOR USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT HELD BY OTHERS."

Specifications Subject to Change.

For most current version of datasheet, go to FiveStarProducts.com

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