



FIVE STAR® GROUT

High Performance Precision Non-Shrink Grout

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. Five Star® Grout meets the performance requirements of EN 1504-3 (Class R4) and complies with UK Specification for Highway Works Volume 1, Clause 2601. 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 1107-20, and CRD-C 621-93 specifications for non-shrink grout over a wide temperature range of 4°C - 35°C.

ADVANTAGES

- Air Release technology equals: Controlled Expansion - Plastic State; Dimensional Stability - Hardened State
- 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 metallic gas generating additives, such as aluminum powder
- Non-shrink from the time of placement
- High early and ultimate compressive strengths

USES

- Grouting of machinery and equipment to maintain precision alignment
- Non-shrink grouting of structural steel and precast concrete
- Gap thickness of 12-160 mm
- Support of tanks and vessels

PACKAGING AND YIELD

Five Star® Grout is packaged in 25 kg bags yielding approximately 13.5 litres of hardened material at maximum water content.

SHELF LIFE

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

TYPICAL PROPERTIES AT 20°C AND MAXIMUM WATER

	Test Standard	Requirement per EN 1504	FSP Result
Compressive Strength	EN 12190:1999		
	1 Day	NR ¹	28 MPa
	7 Days	NR ¹	53 MPa
	28 Days	≥ 45 MPa (Class R4)	62 MPa
Chloride Ion Content	EN 1015-17:2000	≤ 0.05% (Class R4)	0.01%
Bond Strength	EN 1542:1999	≥ 2 MPa	2.3 MPa
Modulus of Elasticity	EN 13412	≥ 20 GPa	23 GPa
Thermal Compatibility	EN 13687-1:2002	≥ 2 MPa (Class R4)	Pass
Carbonation Resistance	EN 13295: 2005	$d_k \leq$ concrete control (Class R4)	$d_k \leq$ concrete control
Fire Classification	EN 1504-3 Section 5.5	Declared	Euroclass A1
Flow Between Glass Plates @ 5°C Flow Between Glass Plates @ 20°C @ 10 mm clearance	HCD Drawing No. K2	Per MCHW 2601, Part 4 (iii): Material should flow under the glass plate and rise ≥ 10 mm above the underside of the top plate at all positions, without signs of segregation, bleeding effervescence or air inclusion	PASS PASS
Working Time at 20°C May be affected by colder & warmer temperatures ²	EN 13395-1 Modified	Declared per FPC ³	45 minutes

¹ NR = Not required

² Refer to Five Star® Technical Bulletins: 101 *Cementitious Grouting in Cold Weather* ; 102 *Cementitious Grouting in Hot Weather*

³ FPC = Factory Production Control

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.

APPLICATION INFORMATION

Mixing Ratio	3.5 - 5.0 L potable water per 25 kg bag	Minimum Plate Clearance	12 mm
Maximum In-Service Temperature	204°C	Placement Depth	12 mm - 160 mm >160 mm, call Five Star

PLACEMENT GUIDELINES

For optimum performance, install at temperatures between 4°C and 35°C. For hot or cold weather grouting contact Five Star Products.

- 1. SURFACE PREPARATION:** Construction practices dictate concrete foundation should achieve its design strength before grouting. All surfaces in contact with Five Star® Grout shall be clean and free of oil, grease laitance and other bond-inhibiting contaminants. To maximize bond, concrete surfaces should be prepared by acceptable means to coarse aggregate exposure. Presoak with potable water concrete surfaces for a minimum of 8 hours, continuously and consistently, via wet rags, wet hessian, ponding, or similar method to obtain a saturated surface dry (SSD) condition.
- 2. FORMWORK:** Formwork should be constructed 24-hours prior to the pour. 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 to be placed between the edge of the baseplate and the form. The clearance for remaining sides shall be 25 - 50 mm. Formwork and areas where bond is not desired must be treated with form oil, paste wax or similar material. Isolation/construction joints may be necessary depending on pour dimensions.
- 3. MIXING: Forced Action Mortar Mixer**
Start with approximately 4.0 litres potable water per 25 kg bag in the mixer. Add Five Star® Grout and mix for approximately 2 – 3 minutes after the addition of the final bag to a uniform consistency. Add additional potable water as necessary to achieve desired flow mixing for an additional 1 – 2 minutes after final addition of potable water. Do not exceed the maximum recommended amount of potable mixing water as directed or add an amount that will cause segregation.
Single Bag Mixing Drill and Paddle
Start with about 4.0 litres in the mix vessel. Add approximately 75-80% of Five Star® Grout to the potable mix water and mix to uniform consistency only until grout easily wets out and add remaining grout and continue to mix to uniform consistency. Add additional potable water as needed to achieve desired flow mixing for an additional 1 – 2 minutes after final addition of potable water. Do not exceed the maximum recommended amount of potable mixing water as directed or add an amount that will cause segregation.
For pours over 160 mm in depth contact Five Star Products for aggregate extension recommendations. For bulk mixing applications, contact Five Star Products.
- 4. PLACEMENT:** Five Star® Grout may be dry packed, poured, or pumped into place. Placement should always be across the shortest distance. A headbox is recommended for pouring applications. Refer to Five Star® Technical Bulletin 108 *Grout Headbox & Plunger*.
- 5. POST-PLACEMENT PROCEDURES:** Five Star® Grout shall be wet cured with potable water for a minimum of 24 hours. After initial 24-hour wet cure, grout shall be coated with an approved curing compound. If curing compound is not used, grout shall be wet cured for an additional 48 hours totaling 3 days. During the curing process, protect the grout from direct sun and wind exposure. Do not allow product to freeze until it reaches 7 MPa compressive strength. In-service operation may begin immediately after the required grout strength has been reached.

PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed information contact Five Star Products at +44 (0) 7469 746101.

HEALTH AND SAFETY

Contains cementitious material. May produce an allergic reaction. 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, READ THE SAFETY DATA SHEET.**

SKU/PRODUCT CODE	DESCRIPTION	#UNITS/PALLET	UNIT SIZE
25510	Five Star® Grout	40	25 kg bag
<p>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."</p>			

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Specifications Subject to Change.
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