



FIVE STAR® HTR GROUT

High Temperature Exposure Nonshrink Grout

PRODUCT DESCRIPTION

Five Star HTR Grout is a unique cement based grout for supporting equipment and structural baseplates in high temperature environments. Five Star HTR Grout can be poured into place, gains strength rapidly and can be exposed to 1000°F (538°C) in three hours and up to 2400°F (1316°C) after a 7-day curing procedure. Five Star HTR Grout shows positive expansion when tested in accordance with ASTM C 827. Five Star HTR Grout meets the performance requirements of ASTM C 1107-02 and CRD-C 621-93 specs for nonshrink grout grades A, B, and C.

ADVANTAGES

- Thermal shock resistant
- High temperature resistance
- Does not fall below original placement volume per ASTM C 1107
- Resistant to sulfates
- High early strengths

USES

- Areas of high temperature exposure
- Thermal cycling up to 2400°F (1316°C)
- Rapid turnaround during shutdowns
- Coker, kiln and foundry applications

TECHNICAL SUPPORT

Five Star Products maintains the industry's foremost Engineering and Technical Support Group:

- Over 50 years of experience in concrete repair
- Technical Center staffed with experienced engineers available for consultation
- Design-A-Spec™ for engineering specification assistance
- Experienced representatives for field service
- Corporate research laboratory available to customize products for unique applications

PACKAGING AND YIELD

Five Star HTR Grout is packaged in heavy-duty polyethylene lined bags containing 50 lb (22.7 kg) yielding approximately 0.42 cubic feet (11.8 liters) at maximum water.

SHELF LIFE

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

TYPICAL PROPERTIES AT 73°F (23°C)

Working Time 20 minutes

Time of Set, ASTM C 266

Initial 40 minutes
Final 45 minutes

Early Height Change, ASTM C 827
Positive Expansion

Compressive Strength, ASTM C 942 (C 109 Restrained)

3 Hours 3500 psi (24.2 MPa)
1 Day 4500 psi (31.1 MPa)
7 Days 5500 psi (38.0 MPa)
28 Days 6500 psi (44.9 MPa)

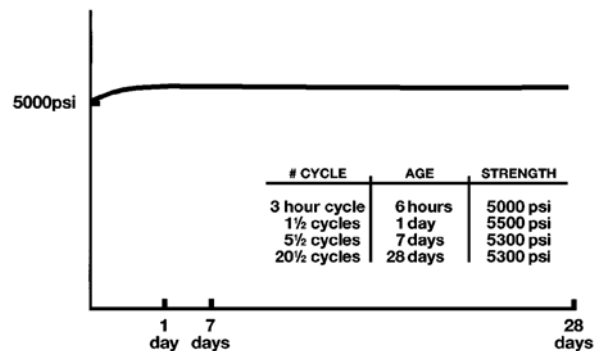
Bond Strength, ASTM C 882

7 Days 2500 psi (17.3 MPa)

Thermal Coefficient of Expansion, ASTM C 531

5.0×10^{-6} in/in/°F (9.0×10^{-6} mm/mm/°C)

Thermal Shock Resistance



Samples cured at 70°F (21°C) for 3 hours, then exposed to 1000°F (538°C) in 24 hour cycles



The data shown above reflect 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 HTR Grout shall be free of oil, grease, laitance and other contaminants. Concrete must be clean, sound and roughened to ensure a good bond. Soak the concrete with liberal quantities of potable water, leaving concrete saturated and free of standing water.
2. **MIXING:** Mix Five Star HTR Grout thoroughly for three to five minutes to a uniform consistency with a mortar mixer. For optimum performance, condition grout to between 60°F and 80°F (16°C and 27°C). Do not exceed maximum recommended amount of mixing water stated on the package or an amount that will cause segregation. Follow printed instructions on the package.
3. **METHODS OF PLACEMENT:** Five Star HTR Grout may be poured into place. For placement thicknesses of less than one inch (25 mm), or greater than three inches (75 mm), call the Five Star Products Engineering and Technical Center at 800-243-2206.
4. **POST-PLACEMENT PROCEDURES:** Five Star HTR Grout shall be wet cured for a minimum of 30 minutes. Approximately three hours after placement, material can be brought up to an operating temperature of 1000°F (538°C). For operating temperature up to 2400°F (1316°C), wet cure for 3 days followed by dry cure for 4 days. Then slowly apply heat up to 2400°F (1316°C).
NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed placement procedures, refer to Design-A-Spec™ or call the Five Star Products Engineering and Technical Center at 800-243-2206.

LIMITATIONS

- At time of placement, if temperatures of equipment and surfaces are above 90°F (32°C), refer to Design-A-Spec™ for hot weather grouting procedures.
- Substrate shall be free of frost and ice.
- Grout shall be protected from freezing until it reaches 1000 psi (6.9 MPa).
- Never exceed the maximum water content stated on the bag.
- For placements thinner than one inch (25 mm) or greater than three inches (75 mm), contact the Five Star Products Engineering and Technical Center.
- 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 evaluated 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.**

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, EXPRESSED 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."

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 Center at 800-243-2206.

Corporate Offices

Five Star Products, Inc.

750 Commerce Drive

Fairfield, CT 06825

Tel: 203-336-7900

Fax: 203-336-7930

www.fivestarprouducts.com



American Owned & Operated

©2006 Five Star Products, Inc.