



# HP EPOXY GROUT

High Performance Precision Grout

Standard/High Flow

**For Nuclear Safety Zone Applications**

## PRODUCT DESCRIPTION

Five Star® HP Epoxy Grout is a high-performance expansive, non-shrink, epoxy system for supporting equipment requiring precision alignment. Five Star® HP Epoxy Grout is a three component, 100% solids, solvent-free system formulated to exhibit high early strength combined with the highest creep resistance at elevated temperatures. Five Star® HP Epoxy Grout exhibits positive expansion when tested in accordance with ASTM C 827. This specialized version of Five Star® HP Epoxy Grout is compliant with NRC 10CFR50 Appendix B and ASME NQA-1 Quality Programs.

## ADVANTAGES

- Permanent support for machinery requiring precision alignment
- High early strength
- Start-up in 16 hours or less
- Solvent-free clean up
- Adjustable flow for various conditions
- Expansive, non-shrink per ASTM C 827
- Superior creep resistance
- Chemically resistant
- 95% Effective Bearing Area (EBA) is typically achieved following proper grouting procedures
- Excellent adhesion to steel

## USES

- High performance machinery grouting
- Crane rail grouting
- Precision alignment under dynamic load conditions
- Vibration dampening filler for rotating equipment
- Support of chemical tanks, vessels and rotating equipment
- Aggressive chemical environments
- Installation of anchors and dowels
- Wind turbine baseplates

## PACKAGING AND YIELD

Five Star® HP Epoxy Grout is a three-component system consisting of partially filled containers of resin, hardener and polyethylene lined bags of aggregate. Five Star® HP Epoxy Grout - Standard Flow includes five bags of aggregate for a unit yield of approximately 2.0 cubic feet (56.6 liters) of hardened material. When maximum flow is required, Five Star® HP Epoxy Grout - High Flow is available with four bags of aggregate for a unit yield of approximately 1.75 cubic feet (49.6 liters) of hardened material.

## SHELF LIFE

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

| TYPICAL PROPERTIES AT 70°F (21°C)                                    |                                                                 |                                                 |                                                                 |                                                 |
|----------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------|
|                                                                      | HP Epoxy Grout (Standard)                                       |                                                 | HP Epoxy Grout (High Flow)                                      |                                                 |
| <b>Clearances</b>                                                    | 4 to 6 inches (100 - 150 mm)                                    |                                                 | 1 to 4 inches (25 - 100 mm)                                     |                                                 |
| <b>Height Change, ASTM C 827, at 90°F (32°C)</b>                     | Positive Expansion                                              |                                                 | Positive Expansion                                              |                                                 |
| <b>Effective Bearing Area</b>                                        | 95%                                                             |                                                 | 95%                                                             |                                                 |
| <b>Creep, ASTM C 1181, 1 year<br/>400 psi (2.8 MPa) 140°F (60°C)</b> | 1.2 x 10 <sup>-3</sup> in/in (mm/mm)                            |                                                 | 2.0 x 10 <sup>-3</sup> in/in (mm/mm)                            |                                                 |
| <b>Tensile Strength, ASTM C 307</b>                                  | 2,400 psi (16.6 MPa)                                            |                                                 | 2,000 psi (13.8 MPa)                                            |                                                 |
| <b>Flexural Strength, ASTM C 580</b>                                 | 4,800 psi (33.1 MPa)                                            |                                                 | 4,400 psi (30.4 MPa)                                            |                                                 |
| <b>Coefficient of Expansion, ASTM C 531</b>                          | 17 x 10 <sup>-6</sup> in/in/°F (30 x 10 <sup>-6</sup> mm/mm/°C) |                                                 | 18 x 10 <sup>-6</sup> in/in/°F (32 x 10 <sup>-6</sup> mm/mm/°C) |                                                 |
| <b>Bond to Concrete, ASTM C 882</b>                                  | Concrete Failure                                                |                                                 | Concrete Failure                                                |                                                 |
| <b>Working Time at 70°F (21°C)</b>                                   | 60 minutes                                                      |                                                 | 45 minutes                                                      |                                                 |
| <b>Compressive Strength, ASTM C 579 B*</b>                           | <b>Standard Compressive Strength psi (MPa)</b>                  | <b>Standard Compressive Modulus psi (MPa)</b>   | <b>High Flow Compressive Strength psi (MPa)</b>                 | <b>High Flow Compressive Modulus psi (MPa)</b>  |
| 16 Hours                                                             | 11,000 (75.9)                                                   | 1.6 x 10 <sup>6</sup> (11.0 x 10 <sup>3</sup> ) | 10,000 (69.0)                                                   | 1.5 x 10 <sup>6</sup> (10.4 x 10 <sup>3</sup> ) |
| 1 Day                                                                | 15,000 (103.5)                                                  | 2.0 x 10 <sup>6</sup> (13.8 x 10 <sup>3</sup> ) | 14,000 (96.6)                                                   | 1.9 x 10 <sup>6</sup> (13.1 x 10 <sup>3</sup> ) |
| 7 Days                                                               | 16,500 (113.9)                                                  | 2.2 x 10 <sup>6</sup> (15.2 x 10 <sup>3</sup> ) | 16,000 (110.4)                                                  | 2.1 x 10 <sup>6</sup> (14.5 x 10 <sup>3</sup> ) |
| Post cured at 140°F (60°C)                                           | 17,500 (120.8)                                                  | 2.5 x 10 <sup>6</sup> (17.2 x 10 <sup>3</sup> ) | 17,000 (117.3)                                                  | 2.3 x 10 <sup>6</sup> (15.9 x 10 <sup>3</sup> ) |

\*Materials tested per ASTM C 579 B. Rate of loading 0.25 inches per minute. 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

- SURFACE PREPARATION:** All surfaces to be in contact with Five Star® HP Epoxy Grout shall be free of oil, grease, laitance and other contaminants. Concrete must be clean, sound, dry and roughened to ensure a good bond. An SSPC-SP6 commercial finish on all metal surfaces will optimize bond development to steel.
- 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 1 to 2 inches (25 - 50 mm). Areas where bond is not desired must be treated with paste wax or polyethylene. Isolation joints may be necessary depending on pour dimensions. Contact Five Star Products' Engineering and Technical Service Center for further information.
- MIXING:** For optimum performance, all components should be conditioned to between 70°F and 80°F (21°C and 27°C) prior to use. Pour all Component B (hardener) into pail containing Component A (resin). Mix thoroughly by hand with a paddle or with a slow speed drill and paddle mixer to avoid air entrapment. Pour mixed liquids into mortar mixer (stationary barrel with moving blades). While mixing, slowly add Component C (aggregate) and mix only until aggregate is completely wet. Add Component C (aggregate) immediately after mixing Component A (resin) and Component B (hardener). Working time is approximately 60 minutes (45 minutes High Flow) when temperatures are at 70°F (21°C).
- METHODS OF PLACEMENT:** Five Star® HP Epoxy Grout may be poured into place. All grout shall be placed from one side to the other, maintaining contact with the bottom of the baseplate at all times. When possible, use of a headbox is highly recommended (refer to the Five Star® Technical Bulletin "Head Box and Plunger" for guidelines). For clearances greater than six inches (150 mm) or volumes more than 20 cubic feet (566 liters), use Five Star® DP Epoxy Grout or call Five Star Products' Engineering and Technical Service Center at 1-800-243-2206.
- POST-PLACEMENT PROCEDURES:** Final finishing should ensure material is flush with bottom edge of baseplate. Finishing of exposed surfaces is aided by using a solvent wiped trowel just before material becomes unworkable. In-service operation may begin immediately after minimum required grout strength and modulus have been achieved.
- CLEAN UP:** All tools and equipment may be cleaned with a water and strong detergent solution before material hardens. Sand may be used as an abrasive. A suitable solvent is required for clean up of material after hardening.

**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

- Flowability and strength gain are adversely affected by lower temperatures.
- For placement temperatures below 55°F (13°C) or above 90°F (32°C), refer to Five Star® Design-A-Spec™.
- To obtain bond, concrete shall be visibly free of surface moisture.
- When clearances are outside the recommended range or when exceeding maximum placement volumes, contact Five Star Products' Engineering and Technical Service Center.
- Do not add solvents to increase flowability.
- For continuous operating temperatures exceeding 180°F (82°C), contact Five Star Products' Engineering and Technical Service Center.
- Construction practices dictate concrete foundation should achieve its design strength before grouting.

## CAUTION

Irritant, toxic, strong sensitizer. Contains epoxy resin and amine. This product may cause skin irritation. Do not inhale vapors. Provide adequate ventilation. Protect against contact with skin and eyes. Wear rubber gloves, long sleeve shirt, goggles with side shields. In case of contact with eyes, flush repeatedly with water and contact a physician. Areas of skin contact should be promptly washed with soap and water. Do not take internally. 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                                                                                                        |
|--------------------|-------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------|
| 33100N             | Five Star® HP Epoxy Standard Grout for Nuclear Safety Zone  | 36 (4 pallets) | Resin (A): 23.8 lbs. ( 10.8 kg)<br>Hardener (B): 4.2 lbs. ( 1.9 kg)<br>Aggregate (C): Five 50 lb. (22.7 kg) Bags |
| 31600N             | Five Star® HP Epoxy High Flow Grout for Nuclear Safety Zone | 36 (4 pallets) | Resin (A): 23.8 lbs. ( 10.8 kg)<br>Hardener (B): 4.2 lbs. ( 1.9 kg)<br>Aggregate (C): Four 50 lb. (22.7 kg) Bags |

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](http://FiveStarProducts.com)

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