



# EPOXY NOVOLAC GROUT

Highly Chemical Resistant Epoxy Grout

## PRODUCT DESCRIPTION

Five Star® Epoxy Novolac Grout is a three component, highly chemical resistant, 100% solids grout designed for industrial applications in aggressive chemical environments where exposure to concentrated acids, alkalis, corrosives or solvents can occur. Five Star Epoxy Novolac Grout has excellent flowability, is highly chemical resistant, and exhibits positive expansion when tested in accordance with ASTM C 827.

## ADVANTAGES

- High chemical resistance
- 95% Effective Bearing Area (EBA)
- Exhibits positive expansion per ASTM C 827
- Excellent impact and wear resistance
- Expansive, nonshrink
- Superior bond to concrete or steel

## USES

- Grouting for machinery/pump baseplates
- High chemical resistance requirements
- Process equipment
- Secondary containment

## PACKAGING AND YIELD

Five Star Epoxy Novolac Grout is a three component system consisting of premeasured containers of resin and hardener and four polyethylene lined bags of aggregate and is available in a unit yielding approximately 1.25 cubic feet (35.4 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)        |  |
|--|--|
| Height Change, ASTM C 827 at 90°F (32°C) | Positive Expansion   |
| Effective Bearing Area                   | 95%  |
| Compressive Strength, ASTM C 579 B*      |  |
| 1 Day                                    | 16000 psi (110 MPa)  |
| 7 Days                                   | 17000 psi (117 MPa)  |
| Post cured at 140° F (60° C)             | 18000 psi (124 MPa)  |
| Bond Strength, ASTM C 882                |  |
| 7 Days                                   | 2500 psi (17.3 MPa)  |
| Tensile Strength, ASTM C 307             |  |
|  | 2300 psi (15.9 MPa)  |
| Flexural Strength, ASTM C 580            |  |
|  | 6000 psi (41.4 MPa)  |
| Coefficient of Expansion, ASTM C 531     |  |
|  | 16 x 10 <sup>-6</sup> in/in/°F<br>(29 x 10 <sup>-6</sup> mm/mm/°C) |
| Working Time at 70°F (21°C)              |  |
|  | 20 minutes   |

| Chemical Resistance Chart* at 70°F (21°C) |                        |                             |
|---|------------------------|-----------------------------|
| Solvents                                  | Organics Acids (Conc.) | Bases / Alkalines (Conc.)   |
| Acetaldehyde                              | Acetic (1-50%)         | Ammonia (1-25%)             |
| Acetone                                   | Acid plating solutions | Ammonium Hydroxide (1-25%)  |
| Acetonitrile                              | Adipic (1-25%)         | Aniline                     |
| Acrylonitrile                             | Azotic (1-50%)         | Barium Hydroxide (1-sat.)   |
| Butyl acetate                             | Battery (1-98%)        | Black Pulp Liquor           |
| Cyclohexane                               | Chromic (1-30%)        | Butyl Amine                 |
| Ethanol                                   | Chlorohydric (1-37%)   | Cadmium Cyanide Plating     |
| Ethyl acetate                             | Dibasic (1-sat.)       | Calcium Hydroxide (1-25%)   |
| Ethyl alcohol                             | Ethanoic (1-50%)       | Chromium Trioxide (1-25%)   |
| Formaldehyde                              | Ethylic (1-50%)        | Copper Cyanide Plating      |
| Isopropyl Alcohol                         | Engravers (1-50%)      | Dimethyl Aniline            |
| Jet Fuel                                  | Hydrochloric (1-37%)   | Hydrogen Peroxide (1-30%)   |
| Kerosene                                  | Hydrofluoric (1-40%)   | Green Pulp Liquor           |
| Methyl Ethyl Ketone                       | Mattling (1-98%)       | Soap solutions              |
| Methanol                                  | Nitric (1-50%)         | Sodium Cyanide (1-15%)      |
| Methyl Alcohol                            | Oil of vitriol (1-98%) | Sodium Hypochlorite (1-9%)  |
| Rubbing Alcohol                           | Oleic                  | Sodium Hydroxide (1-50%)    |
| Wood Alcohol                              | Phosphoric (1-85%)     | Triethanolamine             |
| 1,1,1 Trichloroethane                     | Sulfuric (1-98%)       | Triethylamine               |
| Phenol                                    | Vitriol (1-98%)        | Potassium Hydroxide (1-sat) |

\* NOTE: Many factors effect chemical resistance. Application design, service and exposure temperatures, and the type and amount of impurities in the chemical or in the environment are some important considerations. These test results are reported to serve as a guide to the applicability of the Novolac systems.

\*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**

1. **SURFACE PREPARATION:** All surfaces to be in contact with Five Star® Epoxy Novolac Grout shall be free of dust, oil, grease, laitance curing compounds, 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.
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 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 the Five Star Engineering and Technical Service Center for further information.
3. **MIXING:** For optimum performance, all components should be conditioned to between 65°F and 85°F (18°C and 29°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 out. Working time is approximately 20 minutes when temperatures are at 70°F (21°C).
4. **METHODS OF PLACEMENT:** Five Star Epoxy Novolac 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 less than 1/2 inch (13 mm) or greater than 6 inches (152 mm) call the Five Star Products Engineering and Technical Service Center at (800) 243-2206.
5. **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.
6. **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 Design-A-Spec™ installation guidelines or call the Five Star Products Engineering and Technical Service Center at (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 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 the Five Star Engineering and Technical Service Center.
- Do not add solvents to increase flowability.
- For continuous operating temperatures exceeding 200°F (93°C), contact the Five Star Engineering and Technical Service Center.
- Construction practices dictate concrete foundation should achieve its design strength before grouting.

## **CAUTION**

FOR INDUSTRIAL USE ONLY. 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 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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