XP 230 EPOXY GROUT

Ultra-High Strength Precision Grout

PRODUCT DESCRIPTION

Five Star® XP 230 Epoxy Grout is the highest compressive strength epoxy grout in the Five Star® portfolio. A three-component engineered system, Five Star® XP 230 Epoxy Grout is non-shrink, low exothermic, 100% solids, and solvent-free. Five Star® XP 230 Epoxy Grout is non-shrink as tested in accordance with ASTM C1090 with a high fatigue resistance under dynamic loading conditions. With its ultra-high compressive strength, Five Star® XP 230 Epoxy Grout provides the essential connection between a dynamic wind tower and a static foundation in many cases eliminating the need for a steel bearing plate.

ADVANTAGES

Lower Installed Costs

- Ultra-high compressive strength eliminates the high cost steel bearing plates in many large wind tower applications

Increases Performance Confidence

- High dimensional stability, non-shrink per ASTM C1090
- High fatigue resistance under dynamic loading conditions
- Coefficient of Thermal Expansion and Modulus of Elasticity more closely aligned with steel and concrete
- Low exotherm enables higher monolithic pours

Increases Scheduling and Cost Predictability

- Early strength development enables faster jobsite progress (i.e. torquing bolts, stacking additional tower segments)
- Reduces supply chain complexity and scheduling uncertainty associated with steel bearing plates

Easy to Use

- Long working time
- Place up to 14 inch depth in a single pour
- Low dust formula
- Use current epoxy grout installation techniques

USES

- Wind towers or other high load applications

PACKAGING AND YIELD

Five Star® XP 230 Epoxy Grout is a three-component system consisting of resin, hardener, and three polyethylene lined bags of aggregate yielding approximately 1.17 cubic feet (33.1 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 C1090, at 90°F (32°C)		0.0 - 0.3%	
Effective Bearing Area		> 85%	
Modulus of Elasticity, ASTM C469, 28 days		4.8 x 10^6 psi (33.1 GPa)	
Tensile Strength, ASTM C307		2,500 psi (17.2 MPa)	
Flexural Strength, ASTM C580		5,500 psi (37.9 MPa)	
Coefficient of Thermal Expansion, ASTM C531		12 x 10^{-6} in/in/°F (22 x 10^{-6} mm/mm/°C)	
Bond to Concrete, ASTM C882		Concrete Failure	
Compressive Strength, ASTM C579 B[1]	**50°F (10°C)**	**70°F (21°C)**	**90°F (32°C)**
12 Hours	1,000 psi (6.9 MPa)	15,000 psi (103.4MPa)	19,000 psi (131.0 MPa)
1 Day	10,000 psi (68.9 MPa)	19,000 psi (131.0 MPa)	21,000 psi (144.7 MPa)
7 Days	20,000 psi (137.8 MPa)	22,000 psi (151.6 MPa)	23,000 psi (158.5 MPa)
28 Days	21,000 psi (144.7 MPa)	23,000 psi (158.5 MPa)	23,500 psi (162.0 MPa)
Post-cured at 140°F (60°C)		27,000 psi (186.1 MPa)	
Working Time at 70°F (21°C) May be affected by colder & warmer temperatures[2]		45 Minutes	

[1] Materials tested per ASTM C579 B. Rate of loading 0.25 inches per minute.

[2] Refer to Five Star® Technical Bulletins: Epoxy Grouting in Cold Weather; Epoxy Grouting in Hot Weather

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

Minimum Thickness	2 in. (50 mm)
Placement Depth	2 in. - 14 in. (50 mm - 360 mm) >14 in. (360 mm), call Five Star Products

PLACEMENT GUIDELINES

For optimum performance, install at temperatures between 70°F and 90°F (21°C and 32°C). Maintain grout, substrate, and equipment temperatures above 70°F (21°C) until grout reaches required compressive strength. Flowability and strength gain are adversely affected by lower temperatures. For hot or cold weather grouting refer to Five Star® Technical Bulletins: Epoxy Grouting in Cold Weather; Epoxy Grouting in Hot Weather

1. **SURFACE PREPARATION:** Construction practices dictate concrete foundation should achieve its design strength before grouting. Epoxy grouting on green concrete (>5% moisture) is not recommended. All surfaces to be in contact with Five Star® XP 230 Epoxy Grout shall be dry and free of oil, grease, laitance, and other contaminants. To maximize bond, concrete surfaces should be prepared by acceptable means to coarse aggregate exposure. An SSPC-SP6 commercial finish on all metal surfaces will optimize bond development to steel.
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 1 to 2 inches (25 - 50 mm). Formwork and areas where bond is not desired must be treated with grease, paste wax, or similar material. Isolation/construction joints should be used on pours of larger dimensions / volumes.
3. **MIXING:** Pre-mix Component A (resin) with a slow speed drill for 1 minute. Pour all of Component B (hardener) into the pail containing Component A (resin). Mix thoroughly for 1 - 2 minutes with a paddle or with a slow speed drill. Avoid air entrapment. Pour mixed liquids (combined Components A & B) into a mortar mixer with blades not moving. Immediately add one bag of Component C (aggregate) and start the mortar mixer blades. Slowly add the remaining bags and mix only until aggregate is completely wet. Do not add solvents or water to increase flowability.
4. **METHODS OF PLACEMENT:** Five Star® XP 230 Epoxy Grout may be poured into place using a headbox. Placement should always be across the shortest distance. All grout shall be placed from one side to the other, maintaining contact with the bottom of the baseplate at all times. Grout should be poured to the bottom of the baseplate. Refer to the Five Star® Technical Bulletin 108 Head Box and Plunger for guidelines. For grout depth greater than 14 inches (360 mm) and/or grout volume more than 80 cubic feet (2.2 cubic meters) contact Five Star Products.
5. **POST PLACEMENT PROCEDURES**: Until initial set, ensure that grout maintains continuous contact with the bottom of the baseplate and formwork remains leak-free. No wet curing is allowed. Protect from direct sun exposure until initial set. 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 soap and water before the material hardens. Sand or a similar abrasive may be used with the soap and water to aid in the clean-up.

PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. *For more detailed information contact your local Five Star® Technical Sales Representative at 1-800-243-2206.*

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**.

SKU / PRODUCT CODE	DESCRIPTION	# UNITS/PALLET	UNIT SIZE (WEIGHT | VOLUME - A & B)
33600	Five Star® XP 230 Epoxy Grout	36 (4 pallets)	Resin (A): 11.8 lbs. (5.3 kg) | 1.2 gal (4.6 L) Hardener (B): 3.3 lbs. (1.5 kg) | 0.38 gal (1.4 L) Aggregate (C): 3 Bags 50 lbs. ea. (22.7 kg)

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

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