



TECHNICAL BULLETIN 112

Ultra-High Performance Grout Placement Considerations

Five Star® SP Epoxy Grout is the latest advancement in ultra-high performance epoxy grouts and represents further enhancements to the Five Star product line. No other commercially available grout offers similar high performance characteristics for both today's and tomorrow's applications.

With ultra-high strength its cornerstone, Five Star® SP Epoxy Grout was designed with key engineering properties at the forefront:

- Positive Expansion when tested in accordance with ASTM C 827
- Very High Effective Bearing Area (EBA)
- Very Low Creep when tested in accordance with ASTM C 1181
- Very High Flexural Strength
- Placement Versatility via Pumpable and Pourable Systems
- Exceptional Temperature Resistance — up to 250°F (121°C)

Five Star® SP Epoxy Grout was developed specifically towards high-load equipment packages or grouting within smaller footprints, such as the recently completed Gas Turbine Compressor set at El Paso Natural Gas (see illustrations).

Other applications include crane rails with next generation high load gantry cranes, wind turbine bases with substantial uplift forces and rotating equipment with ever tighter alignment tolerances.

To achieve ultra-high strengths in epoxy grouts, the reaction during cure has to be driven to the limits of current epoxy resin technology. In doing so, the byproduct of this reaction, exotherm, increases as well.



Gas Turbine Compressor
El Paso Natural Gas



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The result is a product with a higher exotherm than other Five Star® Epoxy Grouts:

Five Star® Epoxy Grout	Peak Exotherm Temp.
Five Star® DP Epoxy Grout	96°F - 103°F (35.5°C - 35.5°C)
Five Star® HP Epoxy Grout	108°F - 128°F (42.2°C - 53.3°C)
Five Star® SP Epoxy Grout	155°F (68.3°C)
Five Star® Rapid Epoxy Grout	212°F (100°C)

Due to its higher exotherm, Five Star® SP Epoxy Grout is recommended for pour depths not to exceed 4 inches (10.2 cm) and placement volume limits of approximately 12 cubic feet (340 L). The placement depth still allows Five Star® SP Epoxy Grout to be utilized for many typical grouting application depths, but requires a mandatory use of expansion joints to limit placement volume between joints. A Design-A-Spec™ for Five Star® SP Epoxy Grout is available that incorporates these specific placement and application details.

It is important to remember Five Star® SP Epoxy Grout is not a replacement for Five Star® DP Epoxy Grout or Five Star® HP Epoxy Grout, but was designed to surpass other higher strength systems such as Euclid E3X and Chockfast Red SG. The Euclid E3X system, for example, exhibits shrinkage when tested in accordance with ASTM C 827, has poor EBA, and an exotherm of 177 °F (80.5 °C).

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FIVE STAR PRODUCTS, INC.
60 Parrott Drive
Shelton, CT 06484 USA
Phone: +1 203-336-7900
Support: 1-800-243-2206 (IN THE U.S.)

For information 1-800-243-2206 ▪ FiveStarProducts.com



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