

FIVE STAR® PRODUCTS, INC.

TRUSTED GLOBAL CONSTRUCTION SOLUTIONS



DISCOVER THE FIVE STAR DIFFERENCE

- CEMENT GROUTS
- EPOXY GROUTS
- FOUNDATION SYSTEMS
- CONCRETE REPAIR/OVERLAYS
- MARINE PILE REPAIR SYSTEMS
- COATINGS
- ADHESIVES



FIVE STAR® CEMENT GROUTS

FIVE STAR® CEMENT GROUTS MEET OR EXCEED THE REQUIREMENTS OF INDUSTRY SPECIFICATIONS CRD-C 621 AND ASTM C 1107, GRADES A,B,C

According to the American Concrete Institute (ACI) Report #351.1R – Grouting between Foundations and Bases for Support of Equipment and Machinery, “the most important requirement for a grout that is intended to transfer loads to the foundation is that it has volume change characteristics that result in complete and permanent filling of the space.”

Five Star® cement grouts provide the highest Effective Bearing Area (EBA) and precision nonshrink performance (0.0% shrinkage) ensuring complete and permanent support for equipment, machinery and structures.

Utilizing a unique air release mechanism, all Five Star cement grouts exhibit precision nonshrink performance in both the plastic and hardened states. Unlike other grouts that utilize aluminum powder for expansion, Five Star cement grouts ensure the most consistent and highest level of performance across a wide range of temperatures and job site conditions. Easy to use, Five Star cement grouts can be mixed to drypack, flowable and pumpable consistencies, providing contractors with the greatest job site versatility.

An ISO 9001 certified manufacturer, Five Star produces its cement grouts under strict quality control guidelines that meet or exceed the performance requirements of industry standards ASTM C 827, ASTM C 1090 and ASTM C 1107, Grades A, B and C. This translates into consistent and high performance products from application to application and job site to job site.



Proven dependable for over 50 years in the field, Five Star cement grouts provide complete and long term support of machinery and equipment.

In the construction industry, grouting applications can require very specific performance properties or characteristics. Because of this, Five Star offers the most comprehensive line of precision nonshrink cement grouts for every application:

★ Five Star® Grout

Drypack, flowable and pumpable precision nonshrink grout with a long working time; can be extended with coarse aggregate and mixed via ready mix truck for mass pours.

★ Five Star® Fluid Grout 100

High strength, fluid consistency precision nonshrink grout for very long flow distances or tight clearances.

★ Five Star® Instant Grout

Very fast turnaround, high early strength precision nonshrink grout; typical four hour strengths of 4000 psi, also excellent for cold weather grouting.

★ Five Star® HTR Grout

Fast turnaround, high temperature resistant exposure precision nonshrink grout that can be exposed to service temperatures up to 2400°F.

★ Five Star® Special Grout 120

Flowable and pumpable precision nonshrink grout for saltwater exposure.

★ Five Star® Special Grout 150

Sulfate resistant cement-based, nonmetallic, nonshrink grout for supporting machinery requiring precision alignment.

★ Five Star® Special Grout 400

Cement-based, nonmetallic, nonshrink, fluid grout specifically formulated for grouting of cables and tendons that provides corrosion protection.

★ Five Star® Special Grout 550

The first cement-based, nonshrink grout formulated for grouting at temperatures up to 115°F with no ice or cold water. It is a high performing, versatile, reliable, hot weather, high sulfate resistant, precision grout.

All Five Star cement grouts are nonmetallic, precision nonshrink grouts that exhibit no shrinkage (0.0%).



FIVE STAR® CEMENT GROUTS

NO MANUFACTURER CAN SUPPLY YOU WITH AS MANY ALTERNATIVE SOLUTIONS AS FIVE STAR® PRODUCTS

This precision performance ensures full and complete contact with baseplates, soleplates and other load bearing devices to ensure uniform load distribution and effective load transfer.

Packaged in heavy-duty polyethylene bags for easy storage and use, Five Star® cement grouts yield one cubic foot or one-half cubic foot of grout for easy estimating. Five Star® cement grouts can be extended with coarse aggregate for deep or mass pours where required.



Supported by technical expertise in the field and via Five Star's Corporate Technical Center, Five Star cement grouts offer specifiers and users the most complete and consistent line of solutions for every project.

High Compressive Strength

Five Star cement grouts achieve a higher compressive strength than the concrete substrate on which they are placed, ensuring proper load transfer.

Five Star offers the most complete range of grouts: from products which exhibit slow strength gain and low heat of hydration for large pours, to early very high compressive strength for fast turnaround or cold weather grouting situations. No manufacturer can supply you with as many alternative solutions.

Easy to Use - Long Working Time

Five Star cement grouts (except our fast-setting, Five Star® Instant Grout) provide at least 30 minutes' working time to ensure adequate time for placement. They are also very easy to use, requiring only the addition of water.

Placement Consistencies

By varying the amount of water used during placement, Five Star cement grouts can be mixed to a dry pack, pumpable or flowable consistency to provide multiple methods for placement.

Applications

- ★ Turbines
- ★ Generators
- ★ Pumps
- ★ Paper Machines
- ★ Crushers
- ★ Clarifiers
- ★ Milling Machines
- ★ Tank Supporters
- ★ Baseplates
- ★ Structural Columns
- ★ Anchor Bolts
- ★ Precast and Prestressed Panels

Technical Support

- ★ Over 50 years experience in precision grouting.
- ★ Technical Center with field and project experienced staff 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.

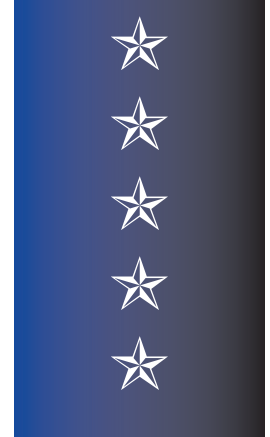
TYPICAL COMPRESSIVE STRENGTH AT 73°F (23°C) ASTM C 109*

	Five Star® Grout		Five Star® Fluid Grout 100		Five Star® Instant Grout
	Min. Water PSI (MPa)	Max. Water PSI (MPa)	Min. Water PSI (MPa)	Max. Water PSI (MPa)	PSI (MPa)
4 hours					4,000 (27.6)
1 Day	4,000 (27.6)	2,500 (17.3)	5,800 (40.0)	3,500 (24.1)	5,000 (34.5)
3 Days	5,500 (37.9)	3,500 (4.1)	7,500 (51.8)	6,000 (41.4)	5,500 (37.9)
7 Days	6,500 (44.8)	5,000 (34.5)	8,000 (55.2)	6,500 (44.8)	6,000 (41.4)
28 Days	8,000 (55.2)	6,500 (44.8)	10,000 (69.0)	8,000 (55.2)	7,000 (48.3)

* For more information, including field studies, performance data, supporting literature or your nearest distributor, contact FIVE STAR at (800) 243-2206

FIVE STAR® EPOXY GROUTS

PERFORMANCE WHEN AND WHERE IT MATTERS MOST



Proven Performance at Full or Reduced Aggregate Loading

Five Star® HP and DP Epoxy Grouts are designed and formulated for critical grouting applications, where performance properties such as shrinkage, creep and compressive strength can affect load transfer and equipment alignment. Five Star HP and DP epoxy grouts are tested for these engineering properties at both full and reduced aggregate loading. Most other epoxy grout manufacturers allow aggregate reduction in the field, but do not publish physical properties for their products at reduced aggregate load.

Placement Versatility, 95% Effective Bearing Area and Nonshrink Performance

Five Star DP Epoxy Grout is a uniquely versatile product. Due to its low exotherm chemistry, Five Star DP Epoxy Grout can be poured at depths up to 24 inches in a single, mass pour when placed with five bags of aggregate or can be used with four bags of aggregate for typical grouting depths, where enhanced flow is required or for reduced temperature installations. Five Star publishes performance properties for Five Star DP Epoxy Grout at both aggregate loadings.

Five Star HP Epoxy Grout is designed for grouting applications up to six inches in depth and where higher early strength development is required.

Five Star HP Epoxy Grout exhibits the lowest creep characteristics of any Five Star Epoxy Grout and can be placed using four or five bags of aggregate. Like Five Star DP Epoxy Grout, Five Star HP Epoxy Grout physical properties are published at both aggregate loadings.

For tighter clearance grouting or very rapid turnaround of machinery and equipment, Five Star Rapid Epoxy Grout provides rapid eight hour strengths for equipment loading and start up. A high flow material, Five Star Rapid Epoxy Grout requires no aggregate reduction for tight grouting clearances down to 1/2 inch.



FIVE STAR® EPOXY GROUTS

ULTRA-LOW CREEP AND DIMENSIONAL STABILITY ARE CRITICAL FEATURES OF FIVE STAR® EPOXY GROUTS

95% Effective Bearing Area Nonshrink Performance

Five Star® delivers the only epoxy grouts that exhibit 0.00% shrinkage from time of placement, tested according to ASTM C 827. This unique characteristic ensures full contact with baseplates and other load bearing surfaces and eliminates the need to inject a resin system to fill voids due to shrinkage in other grouts.

Permanent, Precision Support, Ultra-Low Creep

Five Star epoxy grouts are specifically designed to demonstrate superior resistance to creep as compared to other epoxy grouts at temperatures up to 180°F (82°C). Because it minimizes creep, it maintains the alignment over time and reduces the need to retorque anchor bolts.

Superior Compressive Strength

Five Star epoxy grouts demonstrate high compressive strengths. We offer a range of materials that allow fast turnaround, with very early compressive strength, reducing downtime which saves you money.

High Chemical, Impact and Vibration Resistance

Five Star epoxy grouts combine toughness and resiliency to withstand impact and dynamic loads which might crack cementitious grouts. They resist oils, gasoline, mild acids, alkalis, and most aliphatic hydrocarbons.

Easy to Use/Easy to Place

Five Star epoxy grouts have been designed for superior flowability without aggregate reduction to ensure excellent

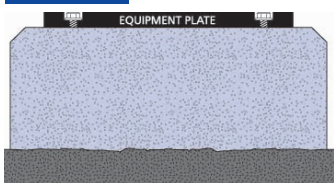
workability, ease of placement, optimum bearing area and maximum creep resistance.

Applications

- ★ High Impact Vibrating Machinery
- ★ Stamping Machines
- ★ Compressors
- ★ Crushers
- ★ Ball Mills
- ★ Chemical Resistance
- ★ Crane Rails
- ★ Slab Tables
- ★ Pumps
- ★ Anchors and More

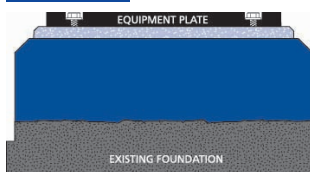
Five Star Foundation Systems

SYSTEM 1



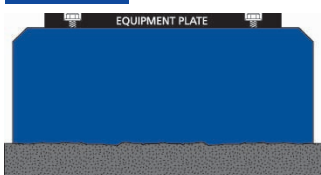
- ★ Single lift cementitious
- ★ One component nonshrink cement grout
- ★ Turnaround time: 3 days
- ★ Large volume pours

SYSTEM 4



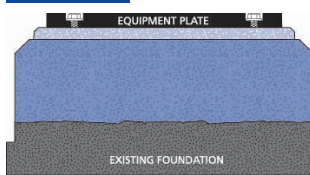
- ★ Multiple lift epoxy
- ★ Three component, expansive, 100% solids, solvent-free epoxy grouts. A low exotherm epoxy grout capped with a rapid start-up epoxy grout
- ★ Turnaround time: 12 hours
- ★ Large volume pours

SYSTEM 2



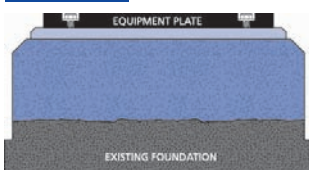
- ★ Single lift epoxy
- ★ Three component, expansive, 100% solids, solvent-free, low exotherm epoxy grout
- ★ Turnaround time: 10 hours
- ★ Large volume pours

SYSTEM 5



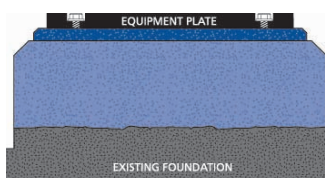
- ★ Multiple lift combination cementitious & epoxy
- ★ One component cementitious repair material plus three component, expansive epoxy grout with rapid start-up
- ★ Turnaround time: 12 - 36 hours

SYSTEM 3



- ★ Multiple lift cementitious
- ★ One component cementitious repair material and nonshrink cement grout
- ★ Turnaround time: 12 - 36 hours

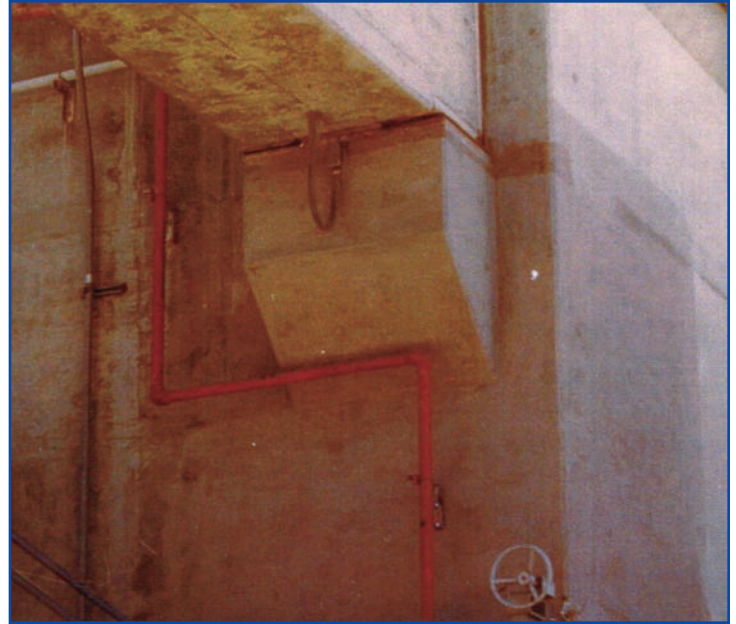
SYSTEM 6



- ★ Multiple lift combination cementitious & epoxy
- ★ One component cementitious repair material plus three component, expansive epoxy grout
- ★ Turnaround time: 16 - 40 hours

FIVE STAR® STRUCTURAL CONCRETE

THE PERMANENT SOLUTION TO CONCRETE REPAIR PROBLEMS



Concrete Repair Applications

- ★ Columns
- ★ Arches
- ★ Beams and Girders
- ★ Floors
- ★ Walls
- ★ Runways and Aprons
- ★ Spalled Concrete
- ★ Floor Leveling
- ★ Equipment Foundations
- ★ Loading Docks
- ★ Marine Structures
- ★ Filling Snap Tie Holes
- ★ Setting Anchors
- ★ Balconies
- ★ Parking Garages

FIVE STAR® STRUCTURAL CONCRETE

FOR OVER 50 YEARS, FIVE STAR® HAS PROVIDED INNOVATIVE SOLUTIONS TO THE CHALLENGES OF STRUCTURAL CONCRETE APPLICATIONS

A truly permanent concrete repair must address and eliminate the major causes of repair failure: delamination, drying, shrinkage, and poor durability. Five Star® Structural Concrete products achieve this with proven performance in these critical areas:

Permanent Bond

Five Star Structural Concrete forms an integral bond to existing concrete, restoring deteriorated or spalled concrete to its original structural integrity with a permanent one-time repair. High bond strength exceeding 2,500 psi (17.3 MPa) eliminates pop-out. No bonding agent is needed, eliminating a costly and difficult requirement.

Drying Shrinkage

Five Star Structural Concrete provides optimum dimensional stability which means the material will not pull away from the existing concrete. It has a thermal coefficient of expansion similar to most concrete.

High Early Compressive Strength

Five Star Structural Concrete's rapid strength gain allows for repairs in a few hours. You will reduce downtime and save money.

Durable

Five Star concrete repair materials have extremely low permeability which enables them to resist the penetration of chemicals, oils and salts, preventing the deterioration of concrete. These products exhibit a high resistance to scaling, freezing and thawing.

Versatile Horizontal, Vertical or Overhead Installations

We provide structural repair solutions for every deteriorated or spalled concrete problem: horizontal, vertical, or overhead. Application methods include pouring, troweling, pumping or shotcreting. You can repair surface spalls or replace slabs up to 12 inches (300mm) in thickness with no layering.

Easy to Use

Just add water, mix to desired consistency and material is ready. No bonding agent or other materials are required.



*For strength you can count on,
depend on the **FIVE STAR®** family
of Structural Concrete Solutions!*

★ FIVE STAR® STRUCTURAL CONCRETE

Five Star® Structural Concrete is a high early strength, one component, low shrinkage permanent concrete repair material. Formulated with patented technology, Five Star Structural Concrete produces a repair which is dimensionally stable, develops an integral bond to the existing concrete, and restores structural integrity within hours of placement.

★ FIVE STAR® STRUCTURAL CONCRETE ES

Five Star® Structural Concrete ES (Extended Set) is a high strength, single component, permanent concrete repair material which provides a 45 minute working time. The extended set facilitates deep/large volume pours up to six cubic yards in a single lift. Formulated with patented technology, Five Star Structural Concrete ES produces a repair which is dimensionally stable, develops an integral bond to the existing concrete, and restores structural integrity within hours of placement. Resistant to many chemicals, Five Star Structural Concrete ES is very effective in equipment foundation rebuilds and can be coated in less than 24 hours.

★ FIVE STAR® STRUCTURAL CONCRETE V/O

Five Star Structural Concrete V/O is a high strength, one component, permanent concrete repair material for vertical and overhead structural repairs. Five Star Structural Concrete V/O produces a repair which is dimensionally stable, develops an integral bond to the existing concrete, and restores structural integrity within hours of placement. Five Star Structural Concrete V/O has a very low chloride ion permeability. Moisture sensitive coatings can be applied in 8 to 24 hours.

FIVE STAR® SOLUTIONS FOR INFRASTRUCTURE

CONCRETE REPAIR AND RESTORATION SYSTEMS FOR TRANSPORTATION AND UTILITY NETWORKS



FIVE STAR® manufactures a complete line of infrastructure products for concrete repair, restoration and retrofitting on bridges, highways, runways, piers, and waste water treatment facilities. Five Star provides engineered patching mortars and fast setting cements for roadwork, highway repairs, dowel bar retrofit and airport runways. Our fast setting patches ensure rapid turnaround times on highway, road and airport runway projects.

Our specially formulated mortars provide superior bond strengths, fast set up times and consistent compressive strengths in the final cured material. Your project will be turned quickly with minimal down time.

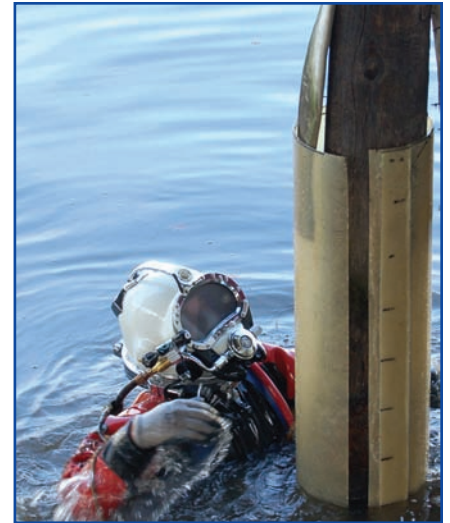
Applications

- ★ Highways
- ★ Bridges
- ★ Parking Decks
- ★ Airports
- ★ Waste Water
- ★ Ports
- ★ Piers/Docks
- ★ Dowel Bar Retrofit
- ★ Crane Rail Grouting
- ★ Light Rail Grouting
- ★ Full and Partial Depth Spall Repair



FIVE STAR® SOLUTIONS FOR MARINE PILE REPAIR

REPAIR AND REHABILITATION OF WOOD, STEEL OR CONCRETE PILES



Five Star® Pile Jacket Products are designed for the repair or protection of wood, concrete or steel dock and bridge pilings that are located in water or subject to degradation due to environmental conditions.

All pilings are subject to deterioration and erosion from water, salt spray, damage from floating objects and being rammed by ships or vehicles. The most effective method of pile rehabilitation is to surround the pile with a Five Star approved fiberglass Pile Jacket System.

Five Star Pile Jacket Grout is then pumped or poured into the annular space between the pile and the fiberglass Pile Jacket. It displaces water and fills all the voids and cracks with a high compressive strength epoxy.

The fiberglass jacket is left in place to provide added strength and additional protection from future damage to the wood, concrete or steel.

Five Star Pile Jacket Grout is a multi-purpose, three component, 100% solids, moisture insensitive epoxy grout specifically designed to cure underwater.

Five Star Pile Jacket Grout has excellent flowability and may be either pumped or poured into place. Five Star Pile Jacket Grout meets ASTM C 881 Type I, II, IV and V, Grade 2, Classes B and C.

Five Star cementitious underwater grout is an underwater pump grade saltwater and salt resistant, cement-based, non-metallic, non-shrink grout for applications requiring precision alignment. When tested in accordance with ASTM C 827, Five Star cementitious underwater grout shows positive expansion. Five Star Pile Jacket Grout meets the performance requirements of ASTM C 1107 and CRD-C 621 specifications for non-shrink grout for Grades A, B and C, over a wide temperature range and a long working time.



Features & Benefits

- ★ Encapsulation Material
- ★ Corrosion Protection for Steel
- ★ Structural Adhesive
- ★ Gravity Fill in Horizontal Concrete and Masonry

Applications

- ★ Marine Pilings
- ★ Power Line Stanchions
- ★ Utility Poles
- ★ Oil Derricks



FIVE STAR® ELASTOMERIC GROUT

FLEXIBLE POLYMER GROUT

Five Star® Elastomeric Grout is specially designed for light rail transportation grouting. The three component system consists of a two component polymer and aggregate that imparts vibration and sound dampening properties combined with exceptional electrical resistance.

Five Star Elastomeric Grout is a solvent-free system that provides rapid cure and superior chemical resistance to a variety of chemicals including oils, fuels, acids, caustics and solvents.

Five Star Elastomeric Grout is less moisture sensitive for long shelf life, it is DOT non-hazardous and is environmentally and applicator friendly. This product is formulated for placements that require good flow and strong bonding to both rail and concrete, while maintaining line and grade.



Applications

- ★ Light Rail
- ★ Railroad Track Rehabilitation
- ★ Flexible Concrete Patching
- ★ Header Repair Compound
- ★ Encapsulating for Post-Tensioning Strands

Features & Benefits

- ★ Precision alignment under dynamic load conditions
- ★ Vibration and noise dampening for rotating equipment
- ★ High electrical resistance
- ★ Chemically resistant
- ★ Low exotherm with early cure
- ★ Strong adhesion to steel and concrete

FIVE STAR® NOVOLAC CHEMICAL RESISTANT PRODUCTS

★ Five Star® Epoxy Novolac Coating

A two component 100% solids, highly chemical resistant epoxy coating. For use on concrete or steel. Use with Five Star® Waterborne Primer on concrete.

★ Five Star® Epoxy Novolac Structural Concrete

A three component 100% solids highly chemical resistant epoxy mortar for the repair or construction of curbs, trenches, floors and pads. Specifically designed for aggressive chemical environments.

★ Five Star® Epoxy Novolac Grout

A three component 100% solids highly chemical resistant epoxy grout for industrial areas where continued exposure to acid and alkalis occur.



Applications

- ★ Tank Linings
- ★ Chemical Processing Plants
- ★ Industrial Processing Plants
- ★ External Coatings
- ★ Secondary Containment Surfaces and Areas
- ★ Precast Trenches
- ★ Machinery Baseplates
- ★ Processing Equipment
- ★ Acid Resistant Brick & Tile

THE FIVE STAR® FAMILY OF QUALITY PRODUCTS

Precision Nonshrink Cement Grouts

FIVE STAR® GROUT

Premier nonmetallic grout for supporting machinery requiring precision alignment

FIVE STAR® INSTANT GROUT

Rapid strength gain grout for four hour machinery start-up and cold weather grouting

FIVE STAR® FLUID GROUT 100

Premier fluid grout for supporting machinery requiring precision alignment

FIVE STAR® HTR GROUT

High temperature exposure grout

FIVE STAR® SPECIAL GROUT 110

Long distance pumpable grout

FIVE STAR® SPECIAL GROUT 120

Salt resistant grout for marine environments

FIVE STAR® SPECIAL GROUT 150

Sulfate resistant grout

Precision Nonshrink Epoxy Grouts

FIVE STAR® HP EPOXY GROUT

High performance epoxy grout for baseplates and bearing surfaces with high chemical, impact or vibration resistance

FIVE STAR® DP EPOXY GROUT

Dual purpose, low exotherm epoxy grout

FIVE STAR® RAPID EPOXY GROUT

Fast turnaround epoxy grout which develops very rapid strength

FIVE STAR® EPOXY CHOCK

Ultra-low creep at high operating temperatures and high load conditions

FIVE STAR® PILE JACKET GROUT

Moisture insensitive epoxy grout specifically designed to cure underwater

FIVE STAR® ELASTOMERIC GROUT

Specifically designed for light rail transportation grouting

Concrete Repairs / Overlays

FIVE STAR® STRUCTURAL CONCRETE

Fast, permanent repair material with high early strength gain for overlays, horizontal repairs and formed vertical surfaces

FIVE STAR® STRUCTURAL CONCRETE ES

Permanent repair material with a longer working time and high early strength gain for overlays, horizontal repairs and foundation upgrades

FIVE STAR® STRUCTURAL CONCRETE S300

Permanent repair material with long working time for overlays, large volume repairs and foundation upgrades

FIVE STAR® STRUCTURAL CONCRETE V/O

Fast, permanent repair material for horizontal, vertical and overhead surfaces

FIVE STAR® STRUCTURAL CONCRETE GUNITE

High early strength, dry process shotcrete repair material

FIVE STAR® STRUCTURAL CONCRETE GUNITE S300

High strength, wet process shotcrete repair material

FIVE STAR® STRUCTURAL CONCRETE GUNITE WP

High strength, wet process shotcrete repair material

FIVE STAR® STRUCTURAL CONCRETE HTR

Fast, high temperature exposure repair material

FIVE STAR® STRUCTURAL CONCRETE HTR SHOTCRETE

Dry process shotcrete applied, high temperature repair material

FIVE STAR® STRUCTURAL CONCRETE UNDERWATER HP

Hand applied underwater repair material

FIVE STAR® STRUCTURAL CONCRETE UNDERWATER PG

Pumpable underwater repair material

Coatings and Waterproofing

FIVE STAR® CEMENT COAT

High performance, cement based coating for concrete and masonry protection

FIVE STAR® WATERPROOFING

High performance, cementitious waterproof coating for concrete and masonry surfaces

Adhesives

FIVE STAR® LV ADHESIVE

Epoxy adhesive

FIVE STAR® INJECTION GEL

Epoxy gel adhesive

FIVE STAR® BONDING

ADHESIVE

Multi-purpose epoxy adhesive

FIVE STAR® RS ANCHOR GEL

Rapid setting epoxy gel and anchoring system

FIVE STAR® FLUID EPOXY

All-purpose fluid epoxy

FIVE STAR® HP ANCHOR GEL

All weather, high performance anchoring gel

Foundation Systems

Six systems for equipment foundation rebuilds with a 12 to 72 hour turnaround and exceeding 25 cubic yds. (19.1cu.m)

SYSTEM 1 Single Lift - Cementitious

SYSTEM 2 Single Lift - Epoxy

SYSTEM 3 Multiple Lift - Cementitious

SYSTEM 4 Multiple Lift - Epoxy

SYSTEM 5 Multiple Lift - Cementitious & Epoxy

SYSTEM 6 Multiple Lift - Cementitious & Epoxy

For inquiries regarding industrial products call: (800) 243-2206

For inquiries regarding Pile Repair Systems call: (800) 243-2206

For more information on our line of products, go to:
www.fivestarprouducts.com



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