CEMENTS | CONCRETES | EPOXIES | GROUTS | MORTARS | MIXING SYSTEMS | CHOCKS

FasTrac CONSTRUCTION PRODUCTS

INDUSTRIAL PRODUCTS REFERENCE GUIDE

RELIABILITY FROM THE FOUNDATION UP

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Packed with expert insights, performance data, and real-world applications, this Industrial Products Reference Guide is the ultimate resource for contractors and engineers working with epoxy grouts, chocks, and cement-based materials. Whether you're tackling precision equipment installs or heavy-duty structural repairs, this guide will help you choose the right materials and get the job done right the first time.

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FasTrac Construction Products

With more than 30 years of experience developing and manufacturing high-performance construction materials, FasTrac has earned a reputation for performance, consistency, and customer-first service.

FasTrac's industrial-grade products and solutions support a wide range of markets, including liquified natural gas (LNG) refineries and chemical processing facilities, pulp and paper, power generation, and wind farms, among many others. We continue to support these industries with an evolving portfolio of products engineered for the most demanding applications.

With corporate offices in Lee's Summit, MO, and manufacturing plants and warehouse facilities in Archie, MO, Cleburne, TX, and the UAE, FasTrac is strategically positioned to serve customers in all 50 states, and across the globe.

When you work with FasTrac, you're not just buying materials, you're gaining a team of experts who understand the demands of your industry, anticipate problems before they occur, and engineer solutions that maximize uptime, extend asset life, and ensure ROI on every project.

FasTrac is your competitive advantage.

Archie, MO - Lab & Manufacturing

Our 50,000 square foot state-of-the-art facility has a testing and product development laboratory, along with an automated toll blending, bagging, packaging and inventory system. By housing product development and testing in the same facility as blending, packaging and inventory, we are uniquely positioned to maintain the tightest quality controls throughout the process.

Cleburne, TX - Lab & Manufacturing

The Cleburne facility is equipped with state-of-the-art technology, enabling us to increase the production of our diverse product line, including rapid-strength cements, high-performance epoxies, and advanced polymer concretes. The vast warehouse space allows us to ensure products are always available and ready to ship at a moment's notice.

Why Choose FasTrac Construction Products

In the industrial world, time is money — and performance is everything. Delays, failures, and rework can cost millions. That's why leading companies across the globe choose FasTrac: because we don't just supply products, we deliver proven results that protect schedules, budgets, and reputations.

From EPC firms building complex facilities, to contractors tackling high-stakes installations, to end users maintaining mission-critical operations, FasTrac is the partner you can trust to solve challenges from the ground up. Our expertise and innovation translate directly into faster installations, longer-lasting performance, and lower total cost of ownership.

Our Portfolio is Custom-Built for Your Industrial Demands

- **CE815 Epoxy Grout** for superior flow and strength
- **CE820 Epoxy Chock** for stability under extreme loads
- **CE830 Novolac** high chemical resistance epoxy grout
- **NS Cementitious Grout** for static and high-load equipment
- **246 SCC** for structural foundation repairs
- **400 Cement** for custom mix designs
- **CE110 Void-Filling Epoxy** for asset protection
- **CE208 Two-Part Epoxy** for uncompromising bond strength
- **EP1500 Truck** for rapid, on-site precision mixing

EP1500 Epoxy Pump Truck


CE110 Crack Injection


246 SCC

LEARN MORE ABOUT OUR INDUSTRIAL PRODUCT SOLUTIONS AT WWW.FASTRACPRODUCTS.COM

Your Satisfaction Our Mission

Using FasTrac products is more than just a purchase — it's an investment in the strength and reliability of your operation. That's why we engineer every product with the same dedication, precision, and care we would if we were putting it to work in our own facilities.

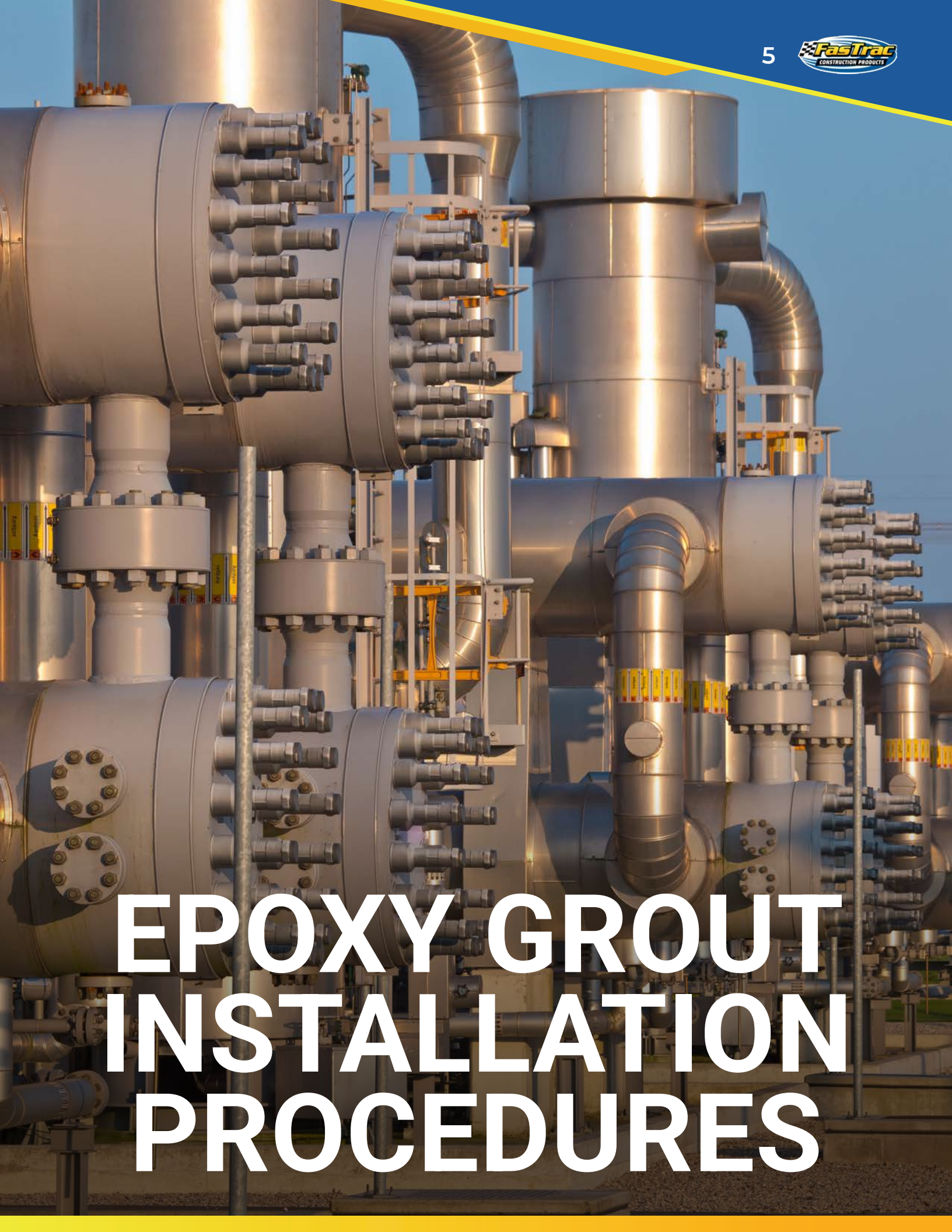
For owners, contractors, and engineers, it means the confidence that comes from proven performance, consistent quality, and dependable support from start to finish. We manufacture industrial products, but what we really build is reliability and trust.

Leverage the experience and expertise that have earned the praise of thousands of satisfied customers across the country and around the world!

"FasTrac has consistently proven to be an incredibly reliable partner for us in more ways than one. From a new construction standpoint, their products have outperformed several other leading grout manufacturers we have used in the past. Having a product that performs as advertised is critical when working under tight completion deadlines, delays can quickly become costly. FasTrac's ability to deliver dependable results on time has allowed us to direct our time, energy, and resources to other areas of our projects where every bit counts.

Where FasTrac truly sets itself apart is in customer service. The insight, experience, and expertise that they bring to the table are unmatched. Whether it's skid design, void repair, or vibration solutions, they have never hesitated to step in."

– Benjamin Jones, Maintenance Supervisor



EPOXY GROUT INSTALLATION PROCEDURES

FasTrac Construction Products
EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

1.0 SCOPE

This procedure governs the minimum technical requirements of epoxy grouts and is intended for the grouting of rotating equipment on concrete foundations for both base plate or sole plate mounted equipment.

2.0 CODE AND STANDARDS

2.1 The following codes and standards are to be used in conjunction with this specification, utilizing the latest edition, addenda, or revision as applicable.

AMERICAN SOCIETY for TESTING and MATERIALS (ASTM)

- **ASTM C579 - Compressive Strength and Modulus of Elasticity**: This standard measures the grout's ability to withstand compressive loads and its elastic deformation under stress. Specimens are tested at specified ages (e.g., 1, 3, 7 days) using a controlled loading rate (Load Rate II), providing data on early and ultimate strength, as well as the modulus of elasticity, which indicates stiffness.
- **ASTM C1181 - Compressive Creep**: This test evaluates the grout's deformation under sustained compressive load over time (e.g., 400 psi at 140°F). It assesses long-term stability and creep resistance, critical for machinery applications where alignment must be maintained.
- **ASTM C307 - Tensile Strength and Tensile Modulus of Elasticity**: This procedure determines the grout's tensile strength by applying a pulling force to break a specimen, and the modulus reflects its elasticity under tension. It measures resistance to pulling forces and flexibility.
- **ASTM C580 - Flexural Strength and Modulus of Elasticity**: This test measures the grout's ability to resist bending forces by applying a load to a beam specimen until failure. The modulus indicates elastic behavior under flexure, assessing durability under dynamic loads.
- **ASTM C882 - Bond Strength**: This method tests the grout's adhesive strength to concrete or steel surfaces by applying a tensile force to a bonded specimen. It ensures effective load transfer and adhesion in machinery baseplates.
- **ASTM C884 - Thermal Compatibility**: This procedure assesses the grout's performance under thermal cycling (e.g., freeze-thaw conditions). It confirms stability and integrity when exposed to temperature changes, preventing cracking or delamination.
- **ASTM D2471 - Gel Time and Peak Exotherm**: This test measures the time taken for the grout to gel (initial set) and the maximum temperature reached during curing. It evaluates working time and heat generation, critical for application control.
- **ASTM C531 - Linear Shrinkage on Cure and Coefficient of Thermal Expansion**: This method determines the grout's shrinkage percentage during curing and its expansion/contraction with temperature changes. It ensures dimensional stability and compatibility with thermal variations.

A. AMERICAN CONCRETE INSTITUTE

- **ACI 351.1R-12, Section 4.5**: Outlines best practices for machinery foundation grouting, emphasizing proper physical properties and best practices for material placement to ensure long-term performance.

B. PROCESS INDUSTRY PRACTICES

- **PIP STS03601** provides standardized requirements for selecting, testing, and installing epoxy grouts for machinery foundations, focusing on strength, stability, and durability. It aligns with ACI guidance while adding industry-specific criteria to ensure reliable, long-term equipment performance.

- **PIP REIE686A** is a Process Industry Practices recommended practice, supplementing PIP REIE686/API RP686, that provides refined procedures, design guidance, and checklists for machinery installation and pre-commissioning, enhancing reliability and standardization across equipment applications.

3.0 GENERAL

3.1 The contractor shall install rotating and reciprocating equipment per this specification, but it should be noted that the contractor shall also follow any instructions provided by the equipment manufacturers. Conflicts shall be resolved by the Owner's representative.

3.2 This specification together with the equipment installation instructions covers the recommended method for the epoxy grouting of all equipment requiring critical alignment and/or in a chemical environment. All equipment shall be grouted with epoxy grout. The epoxy grout shall be applied in accordance with these procedures.

3.3 If requested by the owner, a grouting performance demonstration/training session will be conducted by a FasTrac representative prior to foundation and base-plate preparation and the first epoxy grouting on site. This training session will train the placement personnel, demonstrate the proper preparation and installation methods required.

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EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

4.0 MATERIAL AND TESTING REQUIREMENTS

4.1 Test methods, guides, reports, and recommended practices referenced are to be used, as applicable, to verify material properties and identify acceptable practices applicable to epoxy grouts.

4.2 Epoxy grouts shall meet the minimum requirements of the test as herein specified according to industry standards.

4.2.1 The creep of the epoxy grout shall be less than 0.005 in/in when tested in accordance with ASTM C 1181. The test shall be at 70°F and 140°F with a load of 400 psi.

4.2.2 Linear shrinkage of epoxy grout shall be less than 0.080% and thermal expansion less than 15×10^{-6} in/in/°F when tested in accordance with ASTM C 531.

4.2.3 The compressive strength of epoxy grout shall be a minimum of 14,000 psi in 7 days when tested in accordance with ASTM C 579 Method B, Load Rate II. (See FasTrac Technical Bulletin C 579)

4.2.4 Bond strength of epoxy grout to Portland cement shall be greater than 2000 PSI in accordance with ASTM C 882.

4.2.5 Epoxy grout shall pass the thermal compatibility test when overlayed on Portland cement in accordance with ASTM C 884.

4.2.6 Tensile strength and modulus of elasticity shall be determined by ASTM D 638. The tensile strength shall not be less than 1700 PSI and the modulus of elasticity shall not be less than 1.8×10^{6} psi.

4.2.7 Gel time and peak exothermic temperatures of epoxy grouts shall be determined by ASTM D 2471. Peak exothermic temperatures shall not exceed 110° F when a specimen 6" diameter x 12" high is used. Gel time shall be at least 150 minutes.

4.2.8 Epoxy grout shall be non-expansive and shall not incorporate any gas generating additive.

4.2.9 Aggregate reduction shall only be allowed when manufacturer provides physical test data.

4.3 Selection of grout

4.3.1 FasTrac CE815 Epoxy Grout will be used for all rotating and reciprocating machinery baseplates unless otherwise required by machinery vendor. The grout shall be suitable for supporting precision machinery subject to high impact and shock loading in industrial environments.

4.4 The Epoxy Primer, when used, shall be a lead-free, high solids content, rust-inhibitive, two-component epoxy primer specifically designed for use on metal substrates and in conjunction with epoxy grout.

4.4.1 Surface Preparation: All surfaces must be dry clean and free of all previous coatings, rust and surface contamination. Minimum surface preparation is abrasive blast to Commercial Grade SP-6. Blasted surfaces must be coated within 8 hours. Prior to blast cleaning, remove all deposits of oil or grease using Solvent Clean Method SP-1.

5.0 BASE-PLATE/SOLE-PLATE DESIGN

5.1 All base-plates and sole-plates, where applicable, shall be fabricated in accordance with current ANSI standards as a minimum.

5.2 The base-plate shall be fitted with one 4" minimum grout fill hole uniformly distributed for every 9 square feet of base-plate surface and/or per subdivided section. Each grout hole shall be a one inch cylindrical raised lip to facilitate grout filling.

5.3 Vent holes ½" size shall be provided for each bulkhead compartment at all corners, high points and perimeter edges of the bulkhead. Perimeter vent holes in the base-plate shall be on 12" nominal centers maximum spacing. Any angle iron or "C" channel added for stiffeners will require vent holes on both sides.

5.4 Vertical jacking bolts, 5/8" diameter minimum, shall be provided around the base-plate mounting flange perimeter at each anchor bolt location to facilitate alignment of the base- plate in the vertical direction.

5.5 Machined mounting surfaces for the pump and driver shall have horizontal positioning bolts
½" diameter minimum. Provide eight (8) alignment positioning jack bolts for the driver.

5.6 The horizontal positioning bolts for the machined mounting surfaces shall be bolted on the side of the machined surfaces and not welded to the machined surfaces or the base-plate.

5.7 All welding on the base-plate shall be completed and stress relieved prior to machining pump and driver mounting surfaces.

5.8 No welding shall be allowed on machined surfaces. If required, positioning bolts allow for field machining.

5.9 All machined mounting surfaces shall be coplanar to .002" per foot. All base-plate welds shall be continuous in any location where the weld may be exposed to the chemical environment. All welds shall be crack free.

5.10 Machined mounting surfaces shall extend two (2) inches beyond pump and driver feet on all sides.

5.11 Provide 1/8" minimum shim adjustment under each driver foot foralignment.

5.12 The base-plate shall be designed with four (4) lifting lugs, one at each corner, designed to lift the weight of the complete base-plate pump and driver.

5.13 Anchor bolt holes shall be ¼" larger in diameter than theanchor bolts.

5.14 A detailed certified drawing of the base-plate shall be provided for approval to the Owner's Representative. This drawing shall show the location of the base-plate reinforcement, the areas coated with the grout manufacturer's approved primer, complete dimensions of the base-plate and the dimensions of features such as: vertical jacking bolts, drain lip, drain, grout hole dimensions, rounded corners and air vent holes.

5.15 All structural steel details (reinforcements, stiffeners, etc.) shall be shown on the design drawings. Any structural member that could hinder grout installation shall be shown.

5.16 All bulkhead cross bracing on the underside of the base-plate shall have a 2" x 6" opening to allow for grout flow from bulkhead to bulkhead.

5.17 Radius all corners of base-plate flanges a minimum of one (1) inch. All edges which will be in contact with the epoxy should be rounded to eliminate stress risers.

5.18 Blast and coat bottom of skid as per FasTrac's priming recommendations.

5.19 Primers considered should have a compatible chemistry and high solid content. Typical shop primers shall not be used to coat the base-plate underside or any surface that will be bonded to the epoxy grout. Zinc (hot or cold applied), alkyd or high build epoxy coatings or primers are typically not acceptable due to their low tensile bondstrength.

6.0 EQUIPMENT AND MATERIAL STORAGE

6.1 The Contractor's Mechanical Inspector and the Customer's Inspector shall check the pre- grouting items prior to epoxy grout installation and verify acceptance by signing the appropriate area on the check lists as contained in section 12.0 RECORDS of this specification. When the required check lists are completed and all signatures are obtained, the Contractor's Inspector shall release for epoxy grouting. Grouting must be completed within 24 hours. If not, the base-plate alignment will need to berechecked.

6.2 All epoxy grout materials shall be stored indoors and kept dry, free of moisture in their original shipping containers.

6.3 Storage temperature shall be maintained between 60°F and 80°F. Grouting materials shall be kept between these temperatures for a minimum of forty-eight (48) hours prior to mixing and placement.

6.4 The epoxy grout components shall be stored inside in a dry, weatherproof area. Deviation from this criterion requires approval from the Owner's Representative.

6.5 In hot weather, due to the accelerated rate of curing, the shading of the foundation from sunlight for at least 48 hours before and 24 hours after grouting is required.

6.6 In cold weather, epoxy grout components (including aggregate) must be stored at temperatures between 65°F and 85°F in dry weatherproof conditions. Aggregate component may take up to 48 hours to properly temperature condition. Plan accordingly. When the ambient temperature or the equipment and foundation temperature is below 65°F, the FasTrac representative should be consulted before mixing and placing the grout. The Owner's Representative must approve any procedure for grouting below 65°F.

6.7 In cold weather, tented or tarped structures or enclosures must be built to ensure proper temperatures can be maintained for grout placement. External heating should be properly vented to avoid danger of trapped gases and fumes.

6.8 All personnel should read epoxy grout SDS thoroughly before use. Proper PPE, including eye protection, gloves, long sleeves and dust masks should be worn at all times. A pre-grout safety meeting should be held to ensure all health and safety items are addressed.

7.0 PREPARATION OF FOUNDATION AND ANCHOR BOLTS

7.1 Plastic anchor bolt sleeves shall be used on all anchor bolts. The sleeves are not intended to encourage careless positioning of the anchor bolts. The anchor bolt sleeve's primary function is to prevent bonding of the grout to the anchor bolt and allow stretch in the anchor bolt during final torquing to achieve the design clamping force. The sleeve's secondary function is to allow for slight errors in base-plate hole layouts and small shifting of the anchor bolts during the concrete placement.

7.2 Prior to concrete placement, the anchor bolts should be:

1. Accurately set according to foundation drawings and firmly secured to prevent shifting during concrete placement.
2. Dimensionally checked against the foundation drawings for proper length, diameter, thread length, etc.
3. Checked for proper thread projection.
4. Anchor bolts and sleeves should be wrapped and sealed using a non-bonding material to prevent grout from bonding to anchor bolt and filling anchor bolt sleeve. If duct tape is used to wrap anchor bolts there should be a minimum of three wraps per anchor bolt. Where sleeves are present, sleeves should be completely dry and free of water. Anchor bolt sleeves can be filled with foam. It is imperative that epoxy grout not fill the anchor bolt sleeves.

7.3 Base plate or sole plates shall not be placed on foundations until the concrete has cured. The concrete must be at least seven (7) days old prior to surface preparation or grouting and have a minimum of 80% of design strength after 28 days.

7.4 After the concrete is fully cured, the foundation should be chipped to match IRCI - CSP 6-10 profile, to remove all laitance and defective or weak concrete. A light duty (<25 lbs), handheld pneumatic or 120 volt electric chipper with a chisel type tool shall be used for chipping the foundation. Sandblast, bush- hammer or needle gun preparation of concrete surfaces to be grouted are not acceptable. Do not use jack hammers with sharp pointed chisels. The amount of concrete removed shall be such that the final base plate or sole plate elevation results in 2" to 3" of grout between the surface of the foundation and lower base plate flange or the underside of the sole plate.

7.5 Chamfer all the foundation edges 2" to 4" at a 30° angle, to remove stress concentration. Remove all dust, dirt, chips, oil, water, and any other contaminants and cover the foundation.

7.6 After the foundation has been chipped and if epoxy grout placement does not occur within eight (8) hours or if the surface will not be primed, the foundation shall be covered to prevent it from becoming contaminated or wet.

7.7 Do not remove the tops of the plastic anchor bolt sleeves. Ensure that the sleeves are secure. Check the condition of the bolt threads and repair as necessary. Refer to paragraph 8.3 and 8.4 of this specification for protection of anchor bolt sleeve.

8.0 BASE PLATE / SOLE PLATE PREPARATION

8.1 All drivers and driven equipment shall be removed from the base plates prior to base plate inspection and grouting. Drivers and driven equipment shall be reinstalled after the base- plate has been grouted and after the grout has cured for a minimum of 24 hours. **This requirement may be waived by the OWNERS REPRESENTATIVE.**

8.2 Check to be sure the base plates or sole plates provided by equipment supplier are manufactured in accordance with the engineering specifications. The Contractor must inspect and verify that the base plate or sole plate is in accordance with the Purchaser's specifications. If any deviations from these specifications are identified, the Contractor shall notify the Owner's Representative prior to proceeding.

8.3 When the machine is received on site, the base plate's epoxy coating should be inspected for defects (i.e., chips, gouges, etc.) and repaired per the equipment manufacture and FasTrac's recommendation.

8.4 Base plate or sole plate surfaces (except for mounting pads and threaded holes but including the outside edge) which will be in contact with the epoxy grout shall have been previously coated with an epoxy primer, as recommended by FasTrac. If not coated, the surface shall be sandblasted to white metal and 3 mil anchor profile minimum and coated with one coat of approved primer.

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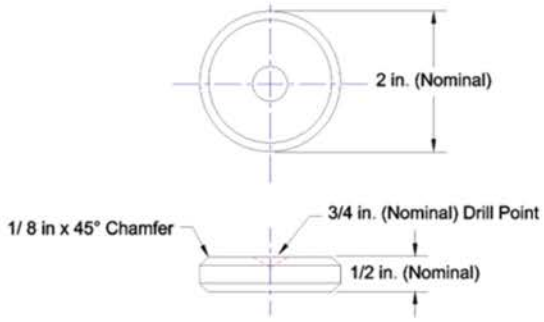
EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

8.5 All base plates shall be provided with at least one grout opening not less than 4" diameter in each bulkhead section. Vent holes, ½" size, shall be provided for each bulkhead compartment at all corners, high points and edges of bulkheads. Air vent holes will also be required along both sides of any stiffener channels added to the base plate underside. All other areas shall have air vent holes on 18" centers. For dropped center trough base plates, the holes shall be in the high section adjacent to the trough. Grout holes in the drip pan area shall have ½ inch raised lip edges.

8.6 Vertical leveling bolt, 5/8" minimum diam., shall be provided around the base plate mounting flanges perimeter at each anchor bolt location to facilitate vertical alignment of the base plate.

Leveling screws and SS leveling pads only shall be used to position the machine or structure at its proper height, and to level the machine. Per API 686 leveling pads corners shall be chamfer at 45 degrees.



8.7 All corners of base plates or sole plates shall be rounded to at least one (1) inch radius to prevent stress risers which can create stress cracking in the grout.

8.8 All cross bracing on underside of base plate shall have 2" x 6" minimum openings to allow for grout flow.

8.9 All surfaces of the base plate or sole plate (including the outside edges), which will be in direct contact with the grout, shall be free of all oil, grease and rust.

8.10 If the epoxy coated base plate is not grouted within thirty (30) days after application of the primer, the epoxy primed surfaces on the base plate shall be roughened with a wire brush to remove the bloom or shine. All dust produced by brushing or sanding shall be wiped off using a water dampened cloth. These surfaces shall be air dried prior to placement of grout.

9.0 INSTALLATION OF BASE PLATE / SOLE PLATE ON FOUNDATION

9.1 Surfaces of the concrete and base plate which will come in contact with the epoxy grout shall be clean and free of oil, rust, and dirt. This cleaning shall be done immediately prior to placement of the base-plate on the foundation. If the base plate and foundation have been primed, a solvent wash or water wash is all that is required. If no primer has been used on the foundation, any contaminated surfaces must be chipped to clean (white) concrete.

9.2 Foundation bolt threads shall be examined for stripped or damaged threads. These threads shall be re-chased or the foundation bolts replaced if necessary. The foundation bolts and their threads shall be protected during the placement of the base plate, leveling and grouting operation.

9.3 If the foundation anchor bolt sleeves tops have been removed, the sleeves shall be filled with a non-bonding, pliable material (i.e., wax, silicone rubber, etc.) and sealed. It is imperative that epoxy grout not be allowed to fill the anchor bolt sleeve.

9.4 Foundation bolts shall be wrapped with one (1) layer of a non-bonding material (Grease or equivalent non-bonding coating) over their entire exposed length to prevent direct contact between the epoxy grout and anchor bolt.

9.5 The vertical leveling bolts shall be coated with a non-bonding material such as Grease or equivalent non-bonding coating to allow the jacking bolts to be backed out of the grout after the grout has cured. Do not use paste wax to lubricate the vertical jacking bolts.

9.6 Install greased coupling guard bolts in coupling guard bolt holes on the base plate to prevent grout from filling these holes (also pipe supports holes, etc.). These bolts shall be installed to their full depth to allow thread embedment in the grout.

9.7 Position the base plate or sole plate on the prepared foundation at the correct elevation, supported on the leveling jack bolts. Circular plates cut from 2" diameter stainless steel bar stock, 1/2" thick, with 45-degree chamfer edges, should be used under each leveling jack bolt to prevent the leveling jack bolts from digging into the concrete and altering the levels. These circular metal plates will remain in the grout. For base plate installation the vertical jacking screw pads do not have to be leveled and grouted. It is suggested that the pads be leveled and grouted for large sole plate installations.

9.8 Piping is not to be attached to the equipment until the base plate has been leveled, grouted and the driver/pump aligned.

Using a Starrett 98 machinists level (or equal) mounted on the machined surfaces for the driver, the jack screws and anchor bolts are adjusted until a level of 0.0005 in. /ft. is obtained in two directions, 90 degrees apart. The machined surfaces for the driven equipment are leveled as above, with a maximum elevation variation across the length of the base plate of 0.010 inch. A precision straight edge should be used across the mounting surfaces to check for coplanarity. The mounting surfaces should be coplanar within 0.002" / ft.

An optical level could be used to speed up all leveling operation.

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EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

10.0 FORMING THE FOUNDATION

10.1 Grout forms shall be built of a minimum of 3/4" thick plywood and shall be securely braced (minimum brace size to be 2" x 4").

10.2 Forms shall provide a minimum of 2" hydrostatic head above the final elevation of the grout.

10.3 Epoxy grout forms must be coated with three coats of non-bonding material, such as a paste wax on all areas that will come in contact with the grout to keep the grout from bonding to the forms. Forms should be waxed before installation, to prevent accidental application of wax to surfaces where the grout is to bond. To permit easy clean-up, wax or cover all surfaces where grout may splash. Allow time for the wax to penetrate into the wood before applying the next coat.

10.4 Before any forms are installed, all concrete surfaces that will contact epoxy grout should be free of any foreign material such as oil, sand, water, grease, etc. (i.e. anything that could have an adverse effect on any bonding surfaces).

10.5 Forms shall be liquid tight. Any open spaces or cracks in forms, or at the joint between forms and the foundation shall be sealed using RTV sealant. The outside top edges and vertical corners of the grout shall be chamfered at 30-45°.

10.6 The 30-45° chamfer strip shall be located at the final elevation of the grout. The final elevation of the grout on base plates with I-beam or C-channel support shall be at the top of the lower support flange. The top of the grout, on base plates with solid sides and sole plates, shall be one (1) inch above the bottom of the base plate or the underside of the sole plate. The grout's final elevation should not be so high as to bond the anchor bolt nut and washer.

10.7 Foundation anchor bolt sleeves shall be filled with a non-bonding, pliable material. It is imperative that epoxy grout not be allowed to fill the anchor bolt sleeve.

10.8 Non-bonding material shall be placed around the exposed threads of anchor bolts to prevent direct contact between the epoxy grout and anchor bolts. Install lubricated bolts into any threaded hole in the base plate, to prevent grout from filling these holes. These bolts should be totally engaged to provide a space under the base plate such that when the bolts are later engaged, the bolt will not apply pressure against the grout and move the base plate.

10.9 If the prepared foundation is not immediately ready for grouting, it shall be protected from oil, dirt and water. The foundation must be clean and dry at the time of grouting.

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EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

11.0 EPOXY GROUT INSTALLATION

11.1 The Contractor shall follow the instruction procedures in Paragraph 7.1.1 through 7.1.13. The FasTrac CE815 manufacturer's requirements and instructions shall be strictly followed.

11.2 Rope off the work area and move all grouting material and tools inside the roped off area just before the job starts. When started, it should be completed without stopping and tools cleaned immediately upon completion.

11.3 Timing and proper mixing produce successful grouting. The FasTrac CE815 instructions must be followed implicitly. Before mixing the components together, bonding surfaces shall be cleaned and dry, forms completed and sealed, rags, cleaning solvents available, adequate manpower and grout (an additional 25% in excess of the calculated requirement of grout should be in the area).

11.4 A mortar mixer is the preferred method for mixing. If used, the mortar mixer speed should not exceed 25 RPM, to avoid whipping air during the mixing process. The mortar mixer should have a clutch to disengage the mixer blades to prevent over mixing the grout.

NOTE: DO NOT MIX PARTIAL UNITS.

11.5 The average epoxy working time is approximately two (2) hours depending on the ambient temperature. For specific times, consult with the FasTrac Representative.

11.6 The epoxy resin and hardener shall be mixed with a Jiffy Mixer per the FasTrac CE815 recommendations (typically three (3) minutes). All the liquid is then poured into the mixer.

11.7 Aggregate is slowly added to the mixer one bag at a time. The grout should be mixed only long enough to wet all the aggregate. Stop the mixer blades from rotating if the grout crew is not ready to place the wetted material. <u>It is a requirement that the mortar mixer have a clutch to disengage the rotating paddles when required.</u>

11.8 Epoxy grout is very viscous. If installing below 70°F ambient temperature, consult FasTrac Representative to determine if aggregate adjustment is necessary. Generally, it is best to start placing the grout at the center of one end of the base plate or sole plate and work toward the ends in such a manner as to force the air out from beneath the base plate or sole plate and out the vent holes. This method eliminates voids.

11.9 Placing of the grout is to be accomplished in a manner which avoids air entrapment. A head box is used to aid in pouring the grout into the grout holes. The head box provides a hydraulic head to force the grout to the vent holes. When the head box is moved to the next grout hole, a 3-6-inch high stand pipe shall be placed over the grout hole and filled with grout. These stand pipes provide a continuous hydraulic head to sweep air from under the base plate to the vent holes. NEVER allow the grout to fall below the base-plate level once the grout has made contact with the base plate. The use of a head box provides a surge volume for the grout as well as provides the critical hydraulic head.

11.10 Push rods, chains or vibrators are not to be used to place epoxy grout under base-plates.

11.11 The initial epoxy grout pour shall be continuous, ensuring complete placement under all sections or compartments of the baseplate. Once the initial lock –in pour between the concrete foundation and the skid has been completed, then additional epoxy grout pours may be considered based on the overall depth or capacity requirements. FasTrac technical representatives are available to review grout installation plans before placement.

11.12 Subsequent batches of grout should be prepared so as to be ready when the preceding batch has been placed. The grouting crew should never have to wait on the mixing operation.

11.13 Check the forms frequently for leaks. Leaks do not self-seal. If not stopped, they will cause voids.

11.14 After the entire baseplate is full, stand pipes should be maintained over each grout hole to continue purging of air. Wipe the purged grout from the air vent holes continuously until the grout stops flowing from the holes. When the grout has started to take an initial set (determined by a noticeable increase in temperature and no flow of grout at the vent holes) the stand pipes can be removed and excess grout cleaned from all surfaces.

11.15 Grout samples for testing be prepared per ASTM C579, Method B, Load Rate II, brass 3 cube molds must be used. It is recommended that 2 sets of 3 cube samples be prepared for each testing interval 1-, 3- & 7-day breaks. 1 set of 3 cubes per testing interval is acceptable per Owner Representative approval. Each prepared mold will be stored in a shaded, protected area, and placed next to the foundation of the equipment being grouted and allowed to cure for 24 hours. After 24 hours, the test samples are to be sent to an outside test facility to be tested for compressive strength per ASTM C579 Method B, Load Rate II.

11.16 Forms may be removed when the epoxy grout is adequately cured. This generally occurs in approximately 24 hours or when the surface becomes firm and not tacky to the touch.

11.17 Before the driver and driven are installed, the baseplate or sole plate shall be checked for voids. All voids shall be repaired before any equipment is installed.

11.18 Drivers and driven equipment can be re-installed after the base-plate has been grouted and the grout has cured for a minimum of twenty-four (24) hours.

12.0 AFTER GROUT HAS CURED

12.1 After the grout has cured, the base plate (or sole-plate) shall be checked for complete grouting by tapping the base plate with a ball peen hammer. If a void is found based on a "hollow" sound, several holes shall be drilled in the base plate deck around the periphery of the void and a single hole drilled approximately in the center of the void. The void will be filled with FasTrac CE110 injection resin; the center hole shall be used to apply the grout and the other holes as air vents.

12.2 If the void is properly vented, there should be no pressure required to fill the void. The CE110 application gun is used only as a means of placement and shall not be used to create pressure. If the base plate is being lifted, release the pressure and retest the base-plate by tapping to determine if a void actually exists. When the void has been filled, all holes should be dressed smooth.

12.3 When using vertical leveling bolts, the stainless-steel jack screw support pads used to level the base-plate will be left in place after grouting.

12.4 The base plate is to remain supported by the jack screws for 48 hours before removing them. The removal of the jack screws will allow the full equipment weight to be distributed over the grouted area. Jack screw removal time is based on surface temperature of the foundation being 75°F or above. The vertical leveling bolt holes shall be filled with RTV or epoxy after being solvent cleaned to remove any bond breaker. A dial indicator shall be placed on the base plate frame and coupling to indicate any movement when jack screws are removed.

12.5 The foundation anchor bolts can now be torqued. The frame shall be dial indicated at each anchor bolt and coupling to determine any movement during torque.

FasTrac Construction Products
EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

HOT WEATHER Epoxy Grouting Guidelines for FasTrac Epoxy Grouts

High temperatures reduce the working time / pot life of any epoxy grout, allow for less placement and finishing time and can contribute to voids, cold joints and overall poor installations due to faster setting in high temperatures.
Successful epoxy grout installations are achieved at temperatures between 65°- 95°F (18°C - 35°C) and above when diligence and proper planning are followed, especially under rotating machinery:

Product and Application Area Conditioning - Critical

1. Precondition concrete foundations, equipment baseplates and grout material using any dry cooling methods (enclosures with AC, fans). DO NOT use water to cool foundations. At a minimum, create shade for area being grouted with tarps or plastic sheeting and to prevent direct sunlight from creating extra heat on concrete and metal surfaces.
2. All grout components – (Part A Resin, Part B Hardener, and Part C Aggregate) shall be delivered to the construction site in original unopened packaging. Each component shall be stored in a dry, weather-proof area within the temperature range of 65°F – 85°F (18°C -29°C) for 48 hours prior to grouting.
3. Store all epoxy grout components in cool, shaded area out of direct sunlight.
4. All surfaces, equipment and tools in contact with epoxy grout should be shaded and kept at temperatures between 65°F - 85°F (18°C - 29°C)
5. Do Not use water to cool surfaces or equipment.
6. Depending on the regional ambient temperature fluctuations throughout the day, it is best to place epoxy grout at night or early in the morning, when temperatures are typically at their lowest.
7. Ensure adequate manpower is available to mix and place epoxy grout in hot weather. Short-staffed installations will increase time for installing epoxy grout and potentially result in cold joints under machinery.
8. Place epoxy grout immediately after mixing, do not allow epoxy grout to sit for extended periods of time in buckets or wheelbarrows.

Mixing and Installation – Important

1. Ensure adequate personnel are available and have separated grouting tasks – Resin and hardener liquid mixing, aggregate addition, transporting, placing epoxy grout.
2. should be kept out of direct sunlight and / or shaded before and during epoxy grout mixing. Headboxes are must when placing epoxy grout to assist flow.
3. Use IR temperature gun to check mix temperatures to ensure they do not exceed 95°F at any time.
4. Place epoxy grout IMMEDIATELY after mixing is complete. Should a delay occur, do not allow epoxy grout to sit in mass in mixer. Transfer into 5-gallon pails to reduce heat generation.

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

HOT WEATHER Epoxy Grouting Guidelines for FasTrac Epoxy Grouts

Post Placement – Important

1. When epoxy grout installations are fully enclosed and cooled, allow for gradual exposure to elevated outside temperatures after installation to avoid thermal shock and excessive grout response that may cause cracking. Maintain shading of application area for 24 hours after placement. Typically, gradual exposure after 24 hours back to ambient temperatures is sufficient once all grout pours have been completed.

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

COLD WEATHER Epoxy Grouting Guidelines for FasTrac Epoxy Grouts

Cold temperatures for epoxy grouts can defined as 60°F or lower. This includes not just air temperatures, but steel, concrete and other contact surfaces. Cold temperatures and cold contact surfaces thicken epoxy grout consistencies and make placements challenging. This can result in voids or cold joints if proper planning is not undertaken:

Product and Application Area Conditioning – Critical

1. Precondition concrete foundations and equipment surfaces to a minimum 65°F – 85°F (18°C - 29°C) for 48 hours prior to grouting. In cold temperatures, 80°F to 85°F is an ideal target for conditioning concrete, steel surfaces, mixing equipment and all grout components.
2. Store all grout components – (Part A Resin, Part B Hardener, and Part C Aggregate) in a fully enclosed, weatherproof and where necessary, heated storage area or shipping container. Store all three epoxy grout components at temperatures of 65°F to 85°F. When checked with an IR temperature gun, each epoxy grout component should be at a minimum 65°F - 85°F including aggregate, at time of use. **NOTE:** Epoxy Grout Aggregate may require upwards of 48 hours of heating to get it all properly conditioned.
3. Tented enclosures may be required for large pours or placements in cold conditions. Enclosures should be wind and weatherproof and shall have external heating to ensure minimum conditioning and placement temperatures are maintained.
4. Combustion heaters if used, must be safely vented and kept away from all flammable materials. A carbon monoxide monitor should be utilized to ensure safe operating conditions in fully enclosed and combustion-heated workspaces.

Mixing And Installation – Important

1. Equipment used for mixing, such as horizontal shaft paddle wheel style mortar mixer or a vertical shaft pancake mixers mortar mixers, may be heated through the drum to assist in achieving and maintaining epoxy grout placement temperatures where necessary.
2. Use of headboxes for placing epoxy grout is mandatory (unless pumping).
3. At no time should epoxy grout aggregate content be reduced beyond manufacturer's recommendation.
4. Continue with any heating (where employed) and maintain 65°F – 85°F (18°C - 29°C) for at least 24 hours once epoxy grout placement is fully completed.

Post Placement – Important

1. Maintain 65°F – 85°F (18°C - 29°C) until epoxy grout compressive strengths have been determined to have been met. See - Testing FasTrac Epoxy Grouts ASTM C579 - for further information on this subject.
2. Open small areas of enclosure to outside environment at appropriate time (24 hours after placement), gradually and slowly introducing colder air into enclosure.
3. Do not remove fully enclosure for at least 24 hours after placement.

13.0 CLEAN-UP OF EQUIPMENT AND PERSONNEL

13.1 The best cleaning procedure for personnel is soap and water. The use of solvents dilutes the organic and does not remove them as well as soap and water.

13.2 Immediately after grouting is completed all tools and mixing equipment shall be cleaned using medium pressure water or solvent. The grout manufacturer's representative should be contacted for best clean up procedure.

13.3 All unused mixed epoxy materials shall be disposed of in an approved waste material cleanout area.

14.0 RECORDS

14.1 The following constitute records which will be maintained and will become part of the Project records:

BASE PLATE or SOLE PLATE DESIGN CHECK LIST FOUNDATION PREPARATION

CHECK LIST

BASE PLATE PREPARATION CHECK LIST

INSTALLATION OF BASE PLATE or SOLE PLATE ON FOUNDATION CHECK LIST

FORMING THE FOUNDATION CHECK LIST

EPOXY GROUT INSTALLATION - MATERIAL CHECK LIST EPOXY GROUT

INSTALLATION - EQUIPMENT CHECK LIST GROUT REPLACEMENT CHECK LIST

QUALITY FIELD INSPECTION LISTS

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

BASE PLATE / SOLE PLATE DESIGN CHECK LIST

		INITIAL
1.	Anchor bolts have 3 mm (1/8 in.) annular clearance in mounting plate holes.	_____
2.	Driver and driven mounting pads are machined parallel within .002" coplanar.	_____
3.	Mounting plate leveling jackscrews have been provided with stainless steel leveling pads.	_____
4.	Base plate or sole plate primed with grout manufacturer's recommended primer.	_____
5.	All outside corners that will be embedded in the grout to have 50 mm (2 in.) minimum radiused corners rounded.	_____
6.	All cross bracing on the underside of the base plate shall have 2" x 6" minimum openings to allow the grout to flow.	_____
7.	Base plate welds shall be continuous and free of cracks for all surfaces subject to chemical exposure.	_____
8.	Base plate will comply with either API 610 or ANSI standards, whichever is applicable.	_____
9.	Machined mounting surfaces shall be two (2) inches longer and two (2) inches wider than the footprint of the driver and the driven.	_____
10.	Mounting plates have been provided with one 10 cm (4 in.) minimum grout filling hole in the center of each bulkhead section.	_____
11.	One half inch (½") air vent holes in the base-plate will be provided at the following locations as a minimum:	
	* Each corner of all bulkheads	_____
	* Perimeter of bulkheads on 18" (maximum) centers	_____
	* Along both sides of any stiffeners	_____
	* All other areas shall have air vent holes on 18" centers	_____

FasTrac Construction Products
EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

FOUNDATION PREPARATION CHECK LIST

INITIAL

BEFORE CONCRETE PLACEMENT:

1. Plastic anchor bolt sleeves are installed on all anchor bolts. _____
2. Each anchor bolt sleeve top is secure and have not been cut off. Once cut, grout sleeve area shall be filled with a non-bonding material. _____
3. If anchor bolts sleeves are not present, then the anchor bolt is protected with duct tape or suitable with a non-bonding material. _____
4. Dimensionally check anchor bolt against the foundation drawings for: _____
   *Proper length of anchor bolt _____
   *Diameter of anchor bolt _____
   *Thread length projection _____
5. Anchor bolts are not tilted or bolt bound and are perpendicular with respect to the bottom of the mounting plate. _____
6. Anchor bolt templates normally can be purchased for anchor bolt locations. _____

AFTER CONCRETE PLACEMENT:

7. The concrete foundation must be at least 7 days old prior to surface preparation, and have a minimum of 3,000 psi compressive strength. _____
8. Base plate or sole plate shall not be placed on the foundation until the concrete surfaces have been properly prepared. _____
9. All concrete surfaces that will be in contact with the epoxy grout have been chipped 3/8" to 3/4" (CSP6 – CSP9 profile) to expose broken aggregate. _____
10. Chamfer all the foundation edges at least 2" to 3" at a 45° angle. _____
11. Immediately after the concrete has been chipped, blow the surface clean of dirt and chips with clean, dry, oil free air and coat the surface with a coating of catalyzed epoxy resin. _____
12. If the foundation has not been primed, the foundation shall be covered to prevent contamination. _____

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

INSTALLATION OF BASE PLATE / SOLE PLATE ON THE FOUNDATION CHECK LIST

INITIAL

BEFORE PLACING THE BASE-PLATE ON THE FOUNDATION:

1. Surfaces of the base plate or sole plate and foundation that will contact the epoxy grout are clean and free of oil, rust, scale, dirt and water. _____
2. Foundation bolt threads checked for stripped or damaged threads. _____
3. Anchor bolt sleeves are secure. If sleeve tops have been removed, fill the sleeve with non-bonding pliable material. _____
4. Foundation bolts wrapped to prevent grout from bonding. _____
5. Vertical jacking bolts coated with Never-Seez, Duxseal or equal (**not paste wax**). _____
6. Install greased coupling guard and pipe support bolts to full embedment. _____
7. Expansion joints should be placed at approximately 1.4 m to 1.8 m (4 ft to 6 ft) intervals in the grout foundation but shall not interfere with cross members and be at least 76 mm (3 in.) from foundation or leveling bolts. _____
8. Expansion joints shall be made from 25 mm to 50 mm (1 in. to 2 in.) thick compressible foam constructed of closed-cell neoprene foam rubber, polyurethane or polystyrene, or equivalent material. _____

PLACEMENT OF BASE PLATE OR SOLE PLATE ON THE FOUNDATION:

9. Place the 2" to 2 ½" diameter x 1/2" thick plates with 45-degree chamfer corners on the foundation to support the vertical jack bolts. _____
10. Position the base plate or sole plate on the foundation supported by the vertical leveling screws. _____
11. Check the elevation of the base plate or sole plate. _____
12. As a minimum, baseplate level shall be set with a master level or a precision machinists level. Repeatability of level readings must be checked by reversing the level 180°. All baseplate readings must be taken on the equipment mounting surfaces. _____
13. General-purpose equipment and ASME pumps baseplate mounting surfaces are to be leveled to within 420 micrometers per meter (0.005 in. per ft). _____
14. API pump baseplate mounting surfaces are to be leveled longitudinally and transversely to within 250 micrometers per meter (0.003 in. per ft). _____
15. Shade the foundation and the base-plate from the sun to allow proper alignment. (48 hrs before) _____
16. Shade the foundation for 48 hours before grouting and 24 hours after grouting. _____

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

17. If ambient temperature or base plate or sole plate is 65°F or below consult with the grout manufacturer for proper cold weather preparation. _____

18. Proceed with leveling the base plate or sole plate with the driver and driven removed. _____

19. If shim packs or wedges were used for alignment, provide forming around the shims or wedges for removal after the grout has cured. _____

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EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

BASE PLATE PREPARATION CHECK LIST

		INITIAL
1.	All drivers and driven equipment are removed from the base plate.	_____
2.	Inspect the base plate or sole plate's epoxy coating for defects. If not coated consult the Owner's Representative.	_____
3.	All base plates shall have at least one (1) 4" diameter grout hole per bulk head section.	_____
4.	½" air vent holes are present per base plate specification and unobstructed.	_____
5.	Vertical jacking screws are present and lubricated at each anchor bolt location.	_____
6.	All corners of base plate or sole plate are rounded to one (1) inch radius.	_____
7.	Cross bracing on underside of base plate have 2" x 6" minimum openings and are unobstructed.	_____
8.	All surfaces of base plate or sole plate which will come in contact with the grout are free of oil, grease, rust, dirt or any foreign material which will prevent bonding.	_____
9.	If the base plate is not grouted in place within 30 days after the application of the primer, the epoxy primed surfaces shall be sanded to remove the bloom or shine.	_____
10.	Remove all the dust from the sanding with a damp solvent cloth or a water dampened cloth.	_____

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

FORMING THE FOUNDATION CHECK LIST

		INITIAL
1.	Forming material to be ¾" plywood (minimum) with 2" x 4" reinforcement.	_____
2.	Bill of material for forming:	
	*4' x 8' x ¾" (minimum) plywood	_____
	*30-45° chamfer strips	_____
	*2" x 4" lumber	_____
	*Johnson's Paste wax, Duxseal and Silicone (RTV) caulk	_____
	*Nails and/or screws	_____
	*Fasteners to attach forms to concrete.	_____
3.	Apply three coats of Johnson Paste Wax to form material before installation.	_____
4.	Check foundation before forms installed to assure cleanliness and no hydrocarbons or water.	_____
5.	Use silicone (RTV) caulk on all forms to provide water tight forms.	_____
6.	30-45° chamfer strips shall be used on all horizontal and vertical finished edges.	_____
7.	Forms shall be reinforced with 2" x 4" material at any point where notches or protrusions could affect the strength of the parent form material.	_____
8.	If the "TWO POUR PROCEDURE" is used, the forms should be fabricated to extend 2" above the final grout elevation. Chamfer strip is placed at the final grout elevation.	_____
9.	If the "ONE POUR PROCEDURE" is used for grout placement, the horizontal cap boards shall have 3/8" holes drilled for air vents on 18" centers.	_____
10.	Formed foundation must be shielded from rain and other contamination. Foundation must be dry.	_____

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

EPOXY GROUT INSTALLATION - MATERIAL CHECK LIST

		INITIAL
1.	Calculate cubic foot grout requirement plus 10% more & store close to work area.	_____
	$\frac{\text{Length (ft) X width (ft) X depth (ft)}}{2.0\ ft^3/unit}$	_____
	Number of units x 1.1 = Number of units to order.	_____
2.	Locate source of medium pressure water to clean mixer and equipment at completion of grouting.	_____
3.	If water is not available, use diesel or solvent for cleaning.	_____
4.	Duxseal (5 pounds) to seal forms in case of leak.	_____
5.	Five gallon bucket of clean water and hand soap for personnel clean up.	_____
6.	Solvent resistant gloves.	_____
7.	Dust mask for aggregate mixing crew. Reference CE815 Safety Data Sheet	_____
8.	Ear plugs.	_____
9.	Safety glasses and/or goggles.	_____
10.	Protective clothing (paper cover-alls). Reference CE815 Safety Data Sheet	_____
11.	Plastic sheeting to protect equipment and area.	_____
12.	Sand to protect concrete areas from grout spillage.	_____

FasTrac Construction Products

EPOXY GROUT FOR ROTATING EQUIPMENT ON CONCRETE FOUNDATIONS

EPOXY GROUT INSTALLATION - EQUIPMENT CHECK LIST

		INITIAL
1.	Mortar mixer 25 RPM (5 to 7 cubic foot). It is advisable to have a standby mixer if pouring 10 units or more.	_____
2.	Two (2) wheel barrows. (3 cubic foot size).	_____
3.	Timer for checking proper mix time of liquids.	_____
4.	Five (5) gallons of extra gasoline or diesel.	_____
5.	Provide three (3) 8" to 10" wooden chocks to raise the mixer to allow for dumping into the wheel barrows. (Optional if pumping grout)	_____
6.	3/8" to ½" variable speed drill motor for mixing the epoxy liquids.	_____
7.	Locate or provide electrical power source.	_____
8.	Medium size Jiffy Mixer.	_____
9.	Large contractor grade trash bags for disposable waste.	_____
10.	Three (3) finishing trowels for smoothing grout.	_____
11.	Box of rags, flash light and surface thermometer.	_____
12.	Build ramp to support wheel barrow for dumping full wheel barrow into head box on the base plate.	_____
13.	Build a head box frame to fit over grout holes. (36" traffic cone can be used)	_____
14.	Provide 3-6" high material for stand pipes for each grout hole.	_____
15.	Cans of WD-40 or diesel for cleaning the base-plate and finishing exposed shoulders.	_____

"FasTrac has consistently proven to be an incredibly reliable partner for us in more ways than one. From a new construction standpoint, their products have outperformed several other leading grout manufacturers we have used in the past. Having a product that performs as advertised is critical when working under tight completion deadlines, delays can quickly become costly. FasTrac's ability to deliver dependable results on time has allowed us to direct our time, energy, and resources to other areas of our projects where every bit counts.

Where FasTrac truly sets itself apart is in customer service. The insight, experience, and expertise they bring to the table are unmatched.

In an industry where minimizing downtime on critical equipment is essential to success, we place great importance on getting foundations right from the start. FasTrac and their team have been, and continue to be, a key part of achieving that goal."

– Ben J., Maintenance Supervisor

ASTM C579

FasTrac Technical Brief

PROJECT TESTING OF EPOXY GROUTS FOR COMPRESSIVE STRENGTH USING ASTM C579

ASTM C 579 – "Standard Test Method for Compressive Strength of Chemical Resistant Mortars and Grouts" was developed for strength testing of epoxy grouts as well as other high strength, polymer based materials. It is the ONLY correct test method for evaluating compressive strength of epoxy grouts due to very specific load rates and specimen sizes. Other compressive strength test methods (such ASTM C109, that were developed for cementitious materials) should never be used for testing epoxy grouts as this will cause inaccurate test results.

ASTM C579 involves making 2 inch x 2 inch cube mold specimens of epoxy grout and testing via designated time intervals (typically 1 and 7 days or as specified).

Cube molds must be made of brass or steel. Plastic, wooden or cardboard molds are never acceptable for making test specimens.

3 GANG BRASS CUBE MOLD WITH COVER PLATE

PLASTIC INSERT MOLDS

- **Test Sample from Plastic Insert**
- **Low Breaks Due To:**
  - Crowned Surface Causes Point Loading
  - Poorly Shaped Specimen

FasTrac Technical Brief

PROJECT TESTING OF EPOXY GROUTS FOR COMPRESSIVE STRENGTH USING ASTM C579

Two different load rates are available for use in ASTM C579:

Load Rate I – 6000 psi / minute. Typically dialed in to most compression testers.

Load Rate II – 0.125 inches / minute x specimen height (2) = 0.25 inches per minute. Measured with a dial gauge or caliper, the travel rate of the top platen is either measured for 30 seconds (and doubled) or for 1 minute and adjusted accordingly.

WHY LOAD RATES ARE SIGNIFICANT: Strength results on the same sample of grout when using Load Rate I versus Load Rate II **can vary by as much as 30%.**

FasTrac utilizes Load Rate II when QC testing all of their epoxy grouts, so in order to replicate data sheet published properties, **Load Rate II must be used.**

IMPORTANT: THIS CAN BE A CHALLENGE FOR MANY TESTING LABS, AS LOAD RATE II IS A TRAVEL RATE THAT CANNOT SIMPLY BE DIALED IN TO MOST COMPRESSION TESTERS. ENSURE THE TESTING LAB CAN REPLICATE LOAD RATE II IN THEIR TESTING AND **ASK FOR IT TO BE NOTATED ON TEST REPORTS.**

FASTRAC CAN PROVIDE TECHNICAL ASSISTANCE TO TESTING LABS REQUIRING HELP IN CREATING / REPLICATING LOAD RATE II TRAVEL RATES. IF LOAD RATE II TRAVEL RATES CANNOT BE ACCOMPLISHED, THERE ARE OTHER WAYS TO ACHIEVE THE APPROXIMATE TRAVEL RATE IN LOAD RATE II VIA DIALED IN LOAD RATES.

ASTM C 579 Testing Time Frames:

Typically 1 and 7 days + either a 28 day break or a retain per 3 gang cube mold – ASTM C579 does not mandate specific time intervals – this is up to the Owner or Specifier. Furthermore, the number of cubes taken depends on the application and specification requirements. Generally, for critical process equipment, three sets of three cubes are taken to approximate beginning, middle and end of placement, with 9 cubes total.

FasTrac Technical Brief

PROJECT TESTING OF EPOXY GROUTS FOR COMPRESSIVE STRENGTH USING ASTM C579

Five Steps to Getting Proper Test Results

All five steps in the testing process are critical to successful and accurate test results.

PREP – Molds must be of proper material of construction, coated with a suitable release agent and easily disassembled for specimen removal. Cover plates should be considered when transport needs to occur after grout sets. DO NOT TRANSPORT GROUT CUBES ANY SIGNIFICANT DISTANCES UNTIL GROUT HAS BEGUN TO HARDEN.

MIXING – Epoxy Grout samples should be taken directly from the mixer, typically after 1 or 2 mixes have been completed. Grout mixing should follow manufacturers recommendations.

MOLDING - Epoxy grout should be placed in the mold in two layers per ASTM C 579. First layer half fills the mold, is tamped with a tamping rod or tongue depressor to eliminate air pockets in corners and in sample. Second layer is immedaitely tamped into the first layer. Both layers should be consolidated into one single layer. Do not stab excessively as to introduce air into specimens.

CURING – Epoxy Grouts are self curing. No water or curatives should be added to the test specimens. Cure temperatures should be a minmum 70°F during cure unless a decsision is made to cure at site. Colder cure temperatures will REDUCE strength results. A simple reduction of 10°F during cure can result in a 15% - 25% difference in strength results reported.

FOR ANY ASSISTANCE IN EPOXY GROUT TESTING, CONTACT FASTRAC CONSTRUCTION PRODUCTS:

(816) 380-4747

sales@fastracproducts.com
www.fastracproducts.com

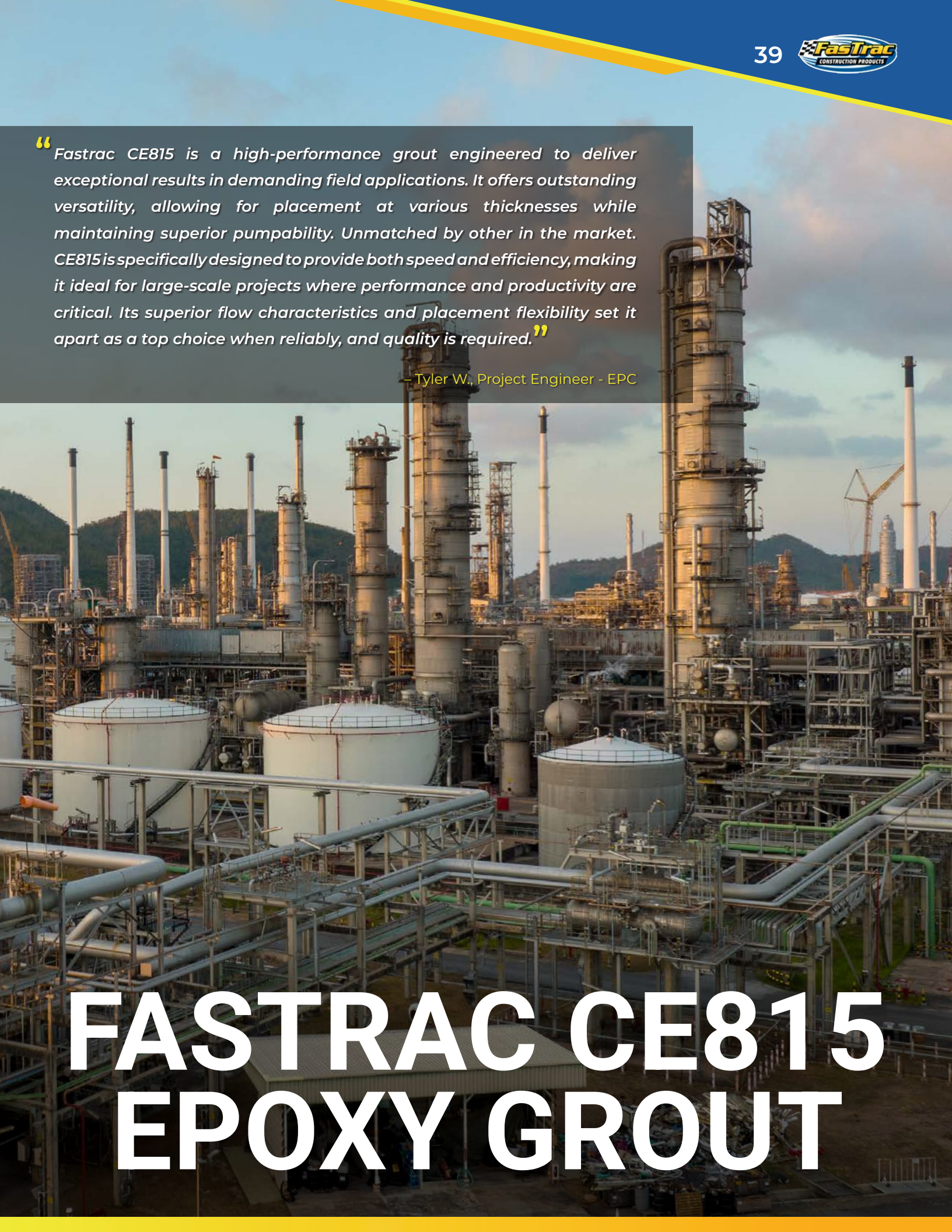
1150 SE Hamblen Rd
Lee's Summit, Missouri 64081

FasTrac Epoxy Grout Testing Repost								
ASTM C579 - Load Rate II - Method B								
Project Name:				Date:				
Contractor:				Project Manager:				
Testing Report Information - ASTM C579 Section 9								
Material Identification								
Material Batch Code Information								
Part A Resin		Part B Hardener			Part C Aggregate			
Mixing Ratio								
Part A Resin		Part B Hardener			Part C Aggregate			
ASTM C579 Test Method - Reference FasTrac Bulletin C579								
Method B					Load Rate II			
0.1 to 0.125 inches per minute crosshead speed x specimen height (2") = 0.20 to 0.25 inches/minute for a 2" epoxy grout cube. This crosshead speed equates to approximately 1,000 to 2,000 lb/sec.								
Capping Material & Method - If Used								
Conditioning Procedure								
Testing Conditions - Temperature & Humidity								
1 - Day		3 - Day		7 - Day		Post Cure		
T	H	T	H	T	H	T	H	

Specimen Weights				
1 - Day	Specimen 1	Specimen 2	Specimen 3	**Defects**
	Specimen 4	Specimen 5	Specimen 6	
3 - Day	Specimen 1	Specimen 2	Specimen 3	**Defects**
	Specimen 4	Specimen 5	Specimen 6	
7 - Day	Specimen 1	Specimen 2	Specimen 3	**Defects**
	Specimen 4	Specimen 5	Specimen 6	
Post Cure	Specimen 1	Specimen 2	Specimen 3	**Defects**
	Specimen 4	Specimen 5	Specimen 6	

Description of failure including type of failure, appearance of specimen, and whether aggregate was fractured.

Loading Rate				
Maximum Load Indicated By Testing Machine				
Compressive Strength				
1 - Day	Specimen 1	Specimen 2	Specimen 3	Specimens Numbers Used Within 15% Tolerance
	Specimen 4	Specimen 5	Specimen 6	Mean Avgerage of Specimens Used
3 - Day	Specimen 1	Specimen 2	Specimen 3	Specimens Numbers Used Within 15% Tolerance
	Specimen 4	Specimen 5	Specimen 6	Mean Avgerage of Specimens Used
7 - Day	Specimen 1 Height: Width:	Specimen 2 Height: Width:	Specimen 3	Specimens Numbers Used Within 15% Tolerance
	Specimen 4	Specimen 5	Specimen 6	Mean Avgerage of Specimens Used
Post Cure	Specimen 1	Specimen 2	Specimen 3	Specimens Numbers Used Within 15% Tolerance
	Specimen 4	Specimen 5	Specimen 6	Mean Avgerage of Specimens Used
Notes:				



"Fastrac CE815 is a high-performance grout engineered to deliver exceptional results in demanding field applications. It offers outstanding versatility, allowing for placement at various thicknesses while maintaining superior pumpability. Unmatched by other in the market. CE815 is specifically designed to provide both speed and efficiency, making it ideal for large-scale projects where performance and productivity are critical. Its superior flow characteristics and placement flexibility set it apart as a top choice when reliably, and quality is required."

– Tyler W., Project Engineer - EPC

FASTRAC CE815 EPOXY GROUT

FasTrac CE815
Physical Properties

PACKAGING AND YIELD

2.4 Cubic Foot Unit (.0679 m^3) – 5 Bag Aggregate Unit | 2.0 Cubic Foot Unit (0.0566 m^3) – 4 Bag Aggregate Unit
0.5 Cubic Foot Unit (.0141 m^3) – 1 Bag Aggregate Unit

PHYSICAL PROPERTIES

Appearance: Component A - Clear, Component B - Amber
Shelf Life: 2 years in original unopened container. Storage Conditions: Store at 40° F – 95° F (4.4° C – 35° C). Condition material to 65° F – 85° F (18.3° C – 29.4° C) before using.

TYPICAL PROPERTIES at 75° F (23.8° C)			
TEST METHOD		**RESULTS**	
		4 BAG UNIT	**5 BAG UNIT**
ASTM C579 Compressive Strength B, Load Rate II			
	1 Day	9,000 psi (62.1 MPa)	10,000 psi (68.9 MPa)
	3 Days	14,000 psi (96.5 MPa)	14,500 psi (100 MPa)
	7 Days	15,500 psi (106.9 MPa)	16,000 psi (110.3 MPa)
ASTM C579 Compressive Modulus of Elasticity		2,200,000 psi (15172 MPa)	2,100,000 psi (14483 MPa)
ASTM C1181 Compressive Creep 400 psi @140° F (2.8 MPa @ 60° C)		<0.005 in/in (.127 mm/mm)	<0.005 in/in (.127 mm/mm)
ASTM C307 Tensile Strength		2,500 psi (17.2 MPa)	2,200 psi (15.2 MPa)
ASTM C307 Tensile Modulus of Elasticity		2,100,000 psi (14483 MPa)	2,000,000 psi (13789 MPa)
ASTM C580 Flexural Strength		4,500 psi (31.02 MPa)	4,100 psi (28.26 MPa)
ASTM C580 Modulus of Elasticity		2,000,000 psi (13789 MPa)	2,000,000 psi (13789 MPa)
ASTM C882 Bond Strength		3,500 psi (24.1 MPa)	3,300 psi (22.8 MPa)
ASTM C884 Thermal Compatibility		Pass	Pass
ASTM D2471 Gel Time		60 minutes	120 minutes
ASTM D2471 Peak Exotherm		110° F (43.3° C)	90° F (32.2° C)
ASTM C531 Linear Shrinkage on cure		0.01%	0.01%
ASTM C531 Coefficient of Thermal Expansion			
	4 Bag Unit	16×10^{-6} in/in °F (28×10^{-6} cm/cm °C)	18×10^{-6} in/in °F (32×10^{-6} cm/cm °C)
	5 Bag Unit	14×10^{-6} in/in °F (26×10^{-6} cm/cm °C)	15×10^{-6} in/in °F (25×10^{-6} cm/cm °C)
Pour Depth at 75° F		Minimum ½" up to 12 inches (12 mm up to 300 mm) with proper curing and expansion joint allowance	Minimum ½" up to 24 inches (12 mm up to 600 mm) with proper curing and expansion joint allowance

	4 BAG UNIT		5 BAG UNIT	
Curing Temperature	**Working Time**	**Initial Cure Time**	**Working Time**	**Initial Cure Time**
50° F / 10° C	4 hours	42 hours	8 hours	84 hours
55° F / 12.8° C	3 hours	36 hours	7 hours	72 hours
65° F / 18.3° C	2 hours	30 hours	5 hours	60 hours
75° F / 23.8° C	1.5 hours	24 hours	3.5 hours	48 hours
85° F / 29.4° C	45 min	18 hours	2.5 hours	36 hours
95° F / 35° C	30 min	12 hours	1.5 hours	24 hours
100° F / 37.8° C	20 min	6 hours	1 hour	12 hours

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CASE STUDY – FASTRAC CE815 EPOXY GROUT

HIGH-SPEED GAS COMPRESSOR W CLEARANCE GROUTING

FasTrac CE815 Epoxy Grout is a revolutionary, threecomponent,100% solids high-performance epoxy machine grout. It is characterized by low dust, high bearing area, low exotherm, negligible shrinkage and creep, fast cure and pumpable with excellent high flow qualities for improved workability and placement. **CE815 Epoxy Grout** is ideal for high stress applications such as wind turbines, gas transmission, refining, chemical processing, pulp and paper, crane rail, marine and other machine base plate grouting. New equipment installations or re-grouting applications subject to chemical attack and extreme vibration are ideal for **CE815 Epoxy Grout**. **CE815** can also be used as an anchoring adhesive.

The contractor successfully completed a difficult grout installation using **CE815 Epoxy Grout** on a high-speed gas compressor with < 2" of clearance, surrounded by piping, conduit, and other ancillary equipment. **CE815** has exceptional flow and extended working time which makes it the perfect grout for low clearance on large footprint equipment < 2". The superior flowability of **CE815** requires less head pressure to move. This allowed the contractor to pump the grout at a lower than usual volume and keep the grout within the forms and off the conduit, piping, and ancillary equipment. The extended working time at shallow depths of the **CE815** allowed the contractor to pump the grout at a lower volume and have sufficient time to finish the exposed surfaces.

PROJECT DETAILS

Skid dimensions (each)
20 ft x 41 ft

Design grout clearance - 2 in
Actual clearance range – 1.5 - 12 in

Temperatures during grout Installations
Interior Ambient: 55 - 65°F (12.7 – 18.3°C)
Concrete temperature 58° (14.4°C)
Skid steel temperature 58° (14.4°C)
Part A Resin 72° (22.2°C)
Part B Hardener 72° (22.2°C)
Part C Aggregate 68° (20°C)

The contractor completed installation using a peristaltic grout pump. The installation crew grouted the compressor package using a total of 120 cu. ft. CE815 Epoxy Grout 2 cu. ft. units.

Using the pump provided a consistent flow of material and eliminated the use of head boxes and buckets, resulting in time savings, increased efficiency, reduced waste, and lower cleanup times. By decreasing the turnaround time between grouting operations, the contactor was able to complete the grout installation within the scheduled threeday period, resulting in minimal downtime.

THE DECISION TO USE FASTRAC CE815 EPOXY GROUT WAS BASED ON DIFFERENT FACTORS

1) **Application complexity**
The skids clearance above the top of concrete was 1.5"2". In addition, an intricate array of piping, vessels and other obstructions made grout placement difficult. The lack of proper access eliminated the option to use headboxes and the low clearance hindered the movement of pump hoses from side to side. The substantial 'footprint'– large overall dimensions of the skid required an extremely high flow product to flow the width of the skid with minimal positive head pressure.

2) **Construction schedule**
During the construction phase, grout work was required to be done as quickly as possible to contribute to a faster schedule and a quicker completion date. As a result, CE815 Epoxy Grout was chosen to achieve the shortest turnaround time between grouting operations.

3) **Weather conditions**
The project location experienced variable weather conditions in early spring. While the installation was inside a building, it lacked heating, so temperatures inside the work areas were more susceptible to outside conditions. For grouting to be successful under these conditions, special preparation, handling, and installation techniques were required.

AS A RESULT OF SELECTING CE815 FOR THIS INSTALLATION, THE CUSTOMER ENJOYED A NUMBER OF ENHANCED OPERATIONAL AND PERFORMANCE BENEFITS.

CE815 Epoxy Grout does not require reducing aggregate to improve grout flow which reduces the number of units needed and reduces costs.

The superior flowability of CE815 Epoxy Grout was the key to moving grout across the full width and length of the equipment skid.

CE815 Epoxy Grout is an excellent grout to use when pumping.

The 2 cubic foot unit size CE815 Epoxy Grout allows for more productive grout batching and high-output placement with less time and effort.

CASE STUDY – FASTRAC CE815 EPOXY GROUT

With limited clearance, equipment, conduit, and piping obstructing access a high flow product is an essential component of a successful grout installation. FasTrac CE815 has superior flow characteristic compared to other epoxy grouts. The CE815 Epoxy Grout aggregate design flows incredibly well without reducing aggregate. Therefore, the contractor was able to use a full 2 cf unit when batching material.

The CE815 Epoxy Grout's excellent side to side flow with limited head pressure allowed for placement in a tight location. The extended working time (>60 minutes) allowed the contractor plenty of time to place the grout and finish the surfaces. The combination of CE815 Epoxy Grout and a professional grouting contractor turned a difficult environment into a routine grouting project.

FasTrac CE815

Chemical Resistance Chart

Key:		
	A	Splash & Spill or Immersion Service
	B	Splash & Spill Service
	F	Not Recommended
		Contact FasTrac Construction Products for all elevated temperature service conditions

Chemical Name	Resistance
Acetic Acid 0% - 20%	B
Acetic Acid +25%	F
Acetone	F
Acrylic Acid	F
Aluminum Sulfate	A
Ammonium Chloride	A
Ammonium Hydroxide 25%	A
Ammonium Nitrate	A
Benzene	F
Black Liquor	B
Boric Acid	A
Calcium Chloride	A
Calcium Hydroxide	A
Chlorine	F
Chromic Acid 0% - 20%	B
Citric Acid 0% - 50%	A
Cyclohexane	A
Ethyl Alcohol	A
Ethylene Dichloride	F
Ethylene Glycol	A

Chemical Name	Resistance
Ferric Sulfate	A
Formaldehyde	A
Gasoline	A
Hexane	A
Hydrobromic Acid 0% - 25%	B
Hydrochloric Acid 37%	A
Hydrochloric Acid	B
Hydrofluoric Acid	F
Hydrogen Sulfide	F
Isopropyl Alcohol	A
Kerosene	A
Maleic Acid	F
Methyl Alcohol	A
Methylene Chloride	F
MEK	F
Naptha	A
Nitric Acid 0% - 8%	B
Nitric Acid + 8%	F
Perchlorethylene	A
Phenol	F

FasTrac CE815

Chemical Resistance Chart

Key:		
	A	Splash & Spill or Immersion Service
	B	Splash & Spill Service
	F	Not Recommended
		Contact FasTrac Construction Products for all elevated temperature service conditions

Chemical Name	Resistance
Phosphoric Acid 0% - 25%	B
Phosphoric Acid +25%	F
Potassium Carbonate	A
Potassium Fluoride	B
Potassium Hydroxide	A
Potassium Permanganate	A
Potassium Sulfate	A
Potassium Glycol	A
Salt Water	A
Sodium Bicarbonate	A
Sodium Bisulfate	A
Sodium Bisulfite	A
Sodium Chloride	B
Sodium Fluoride	B
Sodium Hydroxide 0% - 50%	B
Sodium Hypochlorite	F
Sodium Sulfate	A
Sodium Sulfite	A
Stearic Acid	A
Sulfuric Acid 0% - 50%	B

Chemical Name	Resistance
Sulfuric Acid >50%	F
Tetrahydrofuran	F
Toluene	F
Trichloroethylene	F
Turpentine	F
Xylene	F

A SMART PARTNERSHIP BEGINS WITH FASTRAC

FasTrac Construction Products delivers more than materials — we deliver reliability from the foundation up. With over 30 years of experience, our epoxy grouts, repair mortars, and industrial-grade solutions are engineered to perform under the most demanding conditions. From heavy manufacturing and power generation to food processing, LNG, oil servicing, pulp and paper, railways, water treatment, and wind energy, FasTrac supports critical industries with proven performance and consistency.

As a family-owned and operated company, our customer service sets us apart. We don't just ship products — we partner with contractors, engineers, and facility managers to ensure successful outcomes. That means extended working times, high-flow formulations, and tailored solutions designed to maximize uptime, extend asset life, and reduce costly downtime.

With main offices in Lee's Summit, Missouri, and manufacturing plants in Archie, Missouri and Cleburne, Texas, FasTrac has the resources, expertise, and capacity to support projects nationwide. Our single-source strategy provides efficient engineering support, accurate estimates, dependable logistics, and a portfolio that continues to evolve with the industry's needs.

INNOVATIVE INDUSTRIAL SOLUTIONS

- Epoxy Grouts
- Epoxy Chocks
- Performance Coatings
- Crack Repair
- Patch Repair
- Concretes
- Cements
- Mortars
- Finishing Aids
- Cleaning Solutions
- Epoxy Pumps
- Skidsteer Mixers
- Curing Compounds

LEARN MORE ABOUT OUR INDUSTRIAL PRODUCT SOLUTIONS AT **WWW.FASTRACPRODUCTS.COM**







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