



# **BUILDING STRENGTH™**

**EPOXY GROUT  
PRODUCTS**

**CONCRETE  
CONSTRUCTION  
SOLUTIONS**

**BROCHURE**



**DAYTON®  
SUPERIOR**



## The Use of Epoxy Grouting

Heavy machinery with reciprocating, impacting, or rotating masses require a support system that can resist dynamic forces and the resulting vibrations. When excessive, such vibrations may be detrimental to the machinery, its support system, and any operating personnel subjected to them.

Epoxy grouts are a 3-component system, comprising a resin, hardener and specially graded aggregate. When mixed at a specified ratio the resin, hardener and aggregate react to form a cured, chemically resistant grout. Epoxy grouts have superior compressive, tensile, and flexural strengths as well as greater chemical resistance and impact resistance than a cementitious grout.

Epoxy grouts are more costly than cementitious grouts. However, there are definite advantages of epoxy versus cementitious grouts.

- High early strength
- Tenacious adhesion to concrete & steel
- Long working time
- High impact resistance
- Very low Exotherm
- Excellent chemical resistance



*Blend epoxy components*

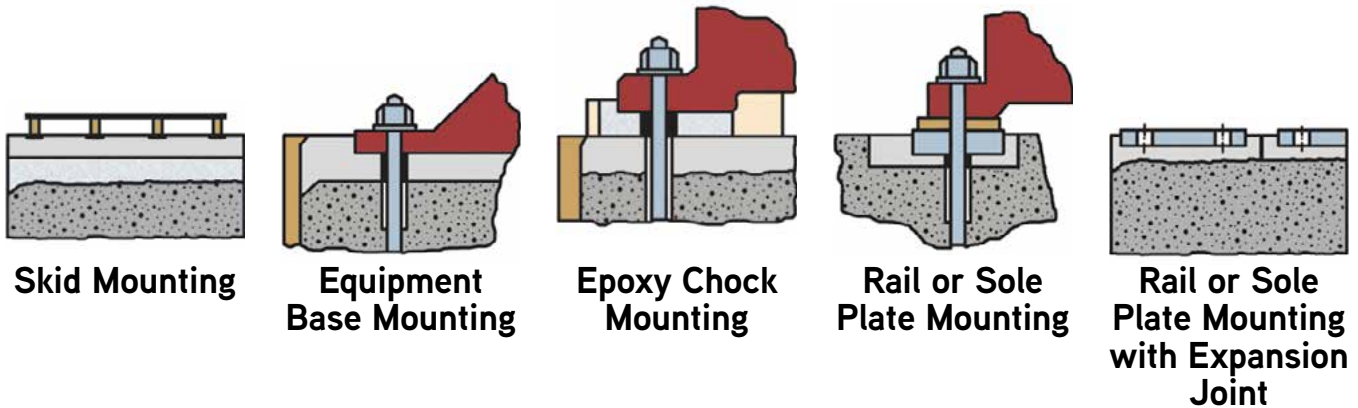


*Pour into mixer*



*Add grout. Mix thoroughly*





**ROTATING MACHINERY:** Large pumps and gas compressors are examples of rotating machinery that would benefit by using epoxy grout on their foundations. Typical industrial installations include power plants, chemical plants, refineries and pipeline stations. These installations require rigid alignment tolerances and vibration dampening to achieve a long service life.

**HEAVY LOAD SUPPORT:** Any installation where high compressive strength is required, and where a long service life is desired, will benefit from the use of epoxy grout. Examples include but not limited to wind tower bases, gantry crane rails, bridge bearing pads, industrial engines and gearboxes.

**FOUNDATION CAPS AND CROWNS:** Foundation caps consist of a layer of epoxy grout placed on top of a reinforced concrete foundation base. It is intended to provide a full base support of machinery and is typically placed in forms which match the full length and width of the underlying concrete. This installation provides the required load support and energy absorption for the machinery. It also provides an impermeable, chemical resistant surface underneath the machine in case of oil, fuel, or other chemical leaks which could degrade a concrete foundation.

**CHOCKS:** Chocks are small placements of epoxy located at anchor bolt locations under equipment and machinery feet. This grout design provides adequate machinery support and vibration dampening with a minimum of epoxy grout required. By using chocks, the majority of a machine base is left open with a maximum clearance height, thereby optimizing equipment base cooling. However, this application does not provide the same protection to the underlying concrete as a full epoxy foundation cap or crown does.

**SKIDS/RAILS, SOLE PLATES, PEDESTALS:** These installations are used for machine bases that have skids, rails or sole plates, where the epoxy grout is placed to support the skid/rail or sole plate areas only. These are long and narrow placements.

**OTHER:** Epoxy grouts may be used for many different applications, and therefore, the details of placement are greatly varied. For example, a wind generator foundation is a circular placement which forms a ring around the entire perimeter of the base. Another unique application is a bridge bearing pad, which is similar to a chock mount.





**TEMPERATURE EFFECTS:** Epoxy grout viscosity increases with decreased temperature. Also, gel time and cure time significantly increase with reduced temperature, and decrease at high temperatures. These factors must be carefully considered for large foundation pours. Any reduction in aggregate must be avoided to increase flow at lower temperatures. Rather, the epoxy grout material should be preconditioned to warm temperatures prior to mixing and placement. Regarding gel time and cure time, allowances must be made in cold temperatures to extend the time to torque anchor bolts until adequate grout strength is achieved. In very hot conditions 95°F (32°C) and above, the material must have an adequately long gel time to allow placement prior to gelling.

**METAL SURFACES:** Metal surfaces should be dry and free of oil, grease, paint and rust for optimum bonding. A white bright metal surface can be obtained by sandblasting or grinding. In high humidity areas, equipment should be grouted immediately after sandblasting or grinding.

**EXPANSION JOINTS:** Expansion joints for epoxy grout should be installed in advance, if possible, when a crane is used to lower the equipment in place. If jacks and rollers are used, then the joints should be added prior to lowering the equipment with the jacks. When expansion joints are required, the following procedures are suggested - expansion joints are normally placed in the non-load bearing shoulders. It is very important that the expansion joint material bonds to the grout so that it does not provide a path to the concrete for oil, water and other contaminants. *Note: Expansion joints should be placed every 4-6 Feet*

**Industry recommendations for installing epoxy grout:**

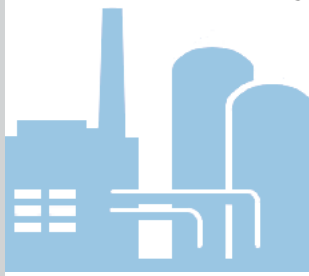
ACI 351.5-15 Specification for Installation of Epoxy Grout between Foundations and Equipment Bases

### Oil and Gas Pipeline



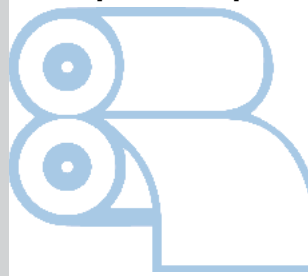
- Engines
- Turbines
- Compressors
- Flood Pumps
- Valve Supports
- Refrigeration Units

### Petroleum Refining



- Engines
- Compressors
- Chemical Pumps
- Annular Rings
- Clarifiers
- Concrete Pads
- Co-Gen
- Tanks
- Structural Steel
- Support Plates
- Processing Machinery
- Fan Supports

### Pulp and Paper



- Barking Drums
- Acid & Caustic
- Pumps
- Paper Machines
- Calenders
- C-Gen Plants
- Fan Housings
- Compressors
- Engines
- Clarifiers
- ID Fan Supports
- U-Drains

### Power Generation



- Engines
- Turbines
- Compressors
- Flood Pumps
- Valve Supports
- Pumps
- Structural Steel
- Support Plates
- Machinery
- Fan Supports

**Epoxy Grout J55 / Unitex<sup>®</sup> Pro-Poxy<sup>™</sup> 2000 NS** (Normal Set) is a matched system of blended aggregates and pre-measured 100% solids, very low exotherm epoxy resin. When mixed, the result is a non-shrink grout that can be placed from 3/4" up to a maximum of 8" (20.3 cm) deep in a single pour resulting in a 95% bearing area when properly installed.

Epoxy Grout J55 / Pro-Poxy 2000 NS can be used for anchor bolts and sleeves, supporting pumps, wind towers, mill tables, crushers, crane rails, large industrial engines, compressors, rotary equipment and other heavy machinery requiring a stable and energy absorbing base support to dynamic loads to maintain precision alignment.

- High early strength
- Excellent flow
- Longer working time
- High impact resistance
- Very low exotherm
- Excellent chemical resistance
- Tenacious adhesion to concrete and steel



**Unitex<sup>®</sup> Pro-Poxy<sup>™</sup> 2000 DP** (Deep Pour) is a matched system of blended aggregates and pre-measured 100% solids epoxy, designed to provide a non-shrink, high-performance, epoxy machine grout for the support of heavy equipment. Applications 3/4" (1.9 cm) to 18" (45.7 cm) can be accomplished with Pro-Poxy 2000 DP. Placements greater than 18 inches (45.7 cm) can also be accomplished when properly extended. Exhibits excellent flow and high bearing support when properly mixed and installed.

Pro-Poxy 2000 DP can be used for anchor bolts and sleeves, supporting pumps, wind towers, mill tables, crushers, crane rails, large industrial engines, compressors, rotary equipment and other heavy machinery requiring a stable and energy absorbing base support to dynamic loads to maintain precision alignment.

- High early strength
- Excellent flow
- 1.5 Hours working time @ 75°F (24°C)
- Very low exotherm allows for deep placements
- High impact resistance
- Superior creep resistance
- Excellent chemical resistance
- Tenacious adhesion to concrete and steel

**Poxy<sup>™</sup>-Chock / Unitex<sup>®</sup> Pro-Poxy<sup>™</sup> Chock** is a 100% solids, VOC compliant two component high strength, pourable epoxy machine chock. It is designed to replace steel chocks for maintaining permanent alignment of machinery and equipment. Pox-Chock / Pro-Poxy Chock exhibits excellent resistance to heavy loading, vibration and chemicals while providing an exceptional degree of high strength and physical properties. It has excellent flowability where tight tolerances are present.

Pox-Chock / Pro-Poxy Chock is specifically formulated, designed and engineered for use as a chocking compound under heavy vibrating equipment such as internal combustion gas engine compressors, engines, turbines, pumps, reduction gears, generators, skid mounted equipment, crane rails, or as replacement for steel chocks.

- Non-shrink
- Chemically resistant
- Excellent flowability
- Low thermal conductivity
- Aggregate free 100% epoxy
- Provides 100% bearing area to base plates





## Average Working and Curing Times

Ambient Temperature	Working Time	Curing Time
<b>Epoxy Grout J55 / Pro-Poxy 2000 NS</b>		
55°F / 18°C	5 hrs	36 hrs
65°F / 21°C	3 hrs	30 hrs
75°F / 24°C	1.5 hrs	24 hrs
85°F / 29°C	45 min	18 hrs
95°F / 35°C	20 min	12 hrs
100°F / 38°C	15 min	8 hrs
<b>Pro-Poxy 2000 DP</b>		
55°F / 18°C	7 hrs	72 hrs
65°F / 21°C	5 hrs	60 hrs
75°F / 24°C	3.5 hrs	48 hrs
85°F / 29°C	2.5 hrs	36 hrs
95°F / 35°C	1.5 hrs	24 hrs
100°F / 38°C	1 hr	16 hrs
<b>Poxy Chock / Pro-Poxy Chock</b>		
55°F / 18°C	3 hrs	72 hrs
65°F / 21°C	1.5 hrs	36 hrs
75°F / 24°C	45 min	18 hrs
85°F / 29°C	25 min	12 hrs
95°F / 35°C	15 min	9 hrs



ASTM Standards	Epoxy Grout J55 / Pro-Poxy 2000 NS	Pro-Poxy 2000 DP	Poxy-Chock / Pro-Poxy Chock
ASTM C579 Compressive Modulus @ 7 days:	2,130,000 psi (14685.8 MPa)	12,000 psi (82.7 MPa)	2,450,000 psi (16,892 MPa)
ASTM C579 Compressive Strength @ 7 days:	12,500 psi (86.2 MPa)	2,000,000 psi (13789.5 MPa)	18,000 psi (131 MPa)
ASTM C942 Compressive Strength			19,000 psi (131 MPa)
ASTM C1181 Compressive Creep @ 1 day:	(400 psi, 140°F) <0.005 in/in	(400 psi, 140°F) <0.005 in/in	
ASTM C307 Tensile Strength	7 days: 2,000 psi (13.8 MPa)	2,000 psi (13.8 MPa)	5,000 psi (34.4 MPa)
ASTM C307 Tensile Modulus of Elasticity		1,900,000 psi (13100 MPa)	2,800,000 psi (19,305 MPa)
ASTM C580 Flexural Strength @ 7 days:	3,400 psi (23.4 MPa)	3,000 psi (20.7 MPa)	6,300 psi (43.4 MPa)
ASTM C580 Flexural Modulus @ 7 days:	2.43 x 10 <sup>-6</sup> psi		
ASTM C882 Bond Strength	7 days 3,700 psi (25.5 MPa) 28 days: 3800 psi (26.2 MPa)	3,000 psi (20.7 MPa)	3,000 psi (20.6 MPa)
ASTM C884 Thermal Compatibility:	Pass	Pass	
ASTM D2471 Gel Time:	180 minutes, 14 oz (415 ml)	300 minutes	
ASTM D2471 Peak Exothermic:	98°F (36.7°C), 14 oz. (415 ml)	95°F (35°C)	
ASTM C531 Linear Shrinkage on Cure:	0.015%	0.005%	0.02%
ASTM C531 Coefficient of Thermal Expansion:	15 x 10 <sup>-6</sup> in/in/°F	20 x 10 <sup>-6</sup> in/in/°F	17 X 10 <sup>-6</sup> in/in/°F
ASTM D2240 Shore D Hardness @ 14 days:	86	93	90
ASTM C905 Density @ 7 days:	147 lb/ft <sup>3</sup> (2,360 kg/m <sup>3</sup> )	144 lb/ft <sup>3</sup> (2,300 kg/m <sup>3</sup> )	110 lb/ft <sup>3</sup> (1,800 kg/m <sup>3</sup> )
ASTM D638 Tensile Strength @ 7 days:	2800 psi (19.3MPa)		
ASTM D638 Tensile Modulus @ 7 days:	4.4 x 10 <sup>-5</sup> psi		
ASTM D695 Compressive Strength @ 7 days:	11,000 psi (75.8 MPa)		
ASTM D695 Compressive Modulus @ 7 days:	3.97 x 10 <sup>-5</sup> psi		
ASTM D 635 Fire Resistance			Self Extinguishing

All of the listed epoxy grouts have a VOC content of 0 g/L. They are compliant with all Canadian and U.S. VOC regulations including Federal EPA, OTC, LADCO, SCAQMD & CARB.







**DAYTON<sup>®</sup>**  
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