Chockfast® Foundation Systems

Proven Solutions to Difficult Problems

ITW Philadelphia Resins

Foundation Systems with Built-in Reliability

- Permanent Alignment
- Chemical Resistant
- Vibration Damping
- Worldwide Service

ESCOWELD®

Industrial Grouts and Polymers

by ITW Philadelphia Resins

For Precise and Permanent Alignment of all Machinery

- Excellent Vibration Damping
- High Compressive & Bond Strengths
- Superior Resistance to Shrinkage, Fretting and Shear Loads
- Serviceability within 24 Hours

ITW

POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems

For all of your critical equipment foundation needs…

About ITW and its family of companies

Illinois Tool Works (ITW) is a Fortune 200 company headquartered in Glenview, IL. We design and produce a wide array of highly engineered fasteners, components, equipment, consumable systems and specialty products for customers around the world. A leading diversified manufacturing company with more than 90 years of history, ITW's nearly 825 decentralized business units in 52 countries employ approximately 60,000 men and women who are focused on crafting value-added products and innovative customer solutions. A core operating principle of ITW is the 80/20 philosophy that allows our people to focus on key products and customers while simplifying operations and improving customer satisfaction. The underlying goals driving all ITW businesses are to create value and improve operating efficiencies for every one of our customers.

I**TW Polymer Technologies** is a grouping of

ITW business units that focus on providing solutions to customers who use polymer materials. Six decades of research and experience in various fields provide us with the resources to remain on the leading edge of technology. We continually strive to create innovative, proven solutions to difficult problems. Included in this group are such well known companies as:

ITW Philadelphia Resins, Montgomeryville, PA, is a leading supplier of polymer grouts, coatings, adhesives and repair compounds to industrial, marine and commercial markets. Brand names include Chockfast, Escoweld, Impax, and Phillyclad.

ITW Polymer Technologies
130 Commerce Drive, Montgomeryville, PA
Telephone: 215.855.8450 • Fax: 215.855.4688
www.philadelphiaresins.com

ITW American Safety Technologies is the worldwide leader in the manufacture of anti-slip floor and deck systems for marine and industrial applications. We also produce a complete line of electrical encapsulants under the Insulcast name.

ITW American Safety Technologies
565 Eagle Rock Avenue, Roseland, NJ
Telephone: 800-631-7841 · Fax: 215.855.4688
www.astantislip.com

ITW also uses a manufacturing facility in Shannon, Ireland, to support our European and Asian markets.

ITW Shannon
Shannon Free Airport, County Clare, Ireland
Telephone: 353.61.471299 · Fax: 353.61.471285
www.itwpolytech.com

ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems

Products are produced in our ISO 9001:2000 facilities in Montgomeryville, U.S.A. and Shannon, Ireland; our products and expertise are available in over 35 countries around the world through our network of product distributors.

As a business unit of Illinois Tool Works (ITW), our operations are supported by the ITW Technology Center in Glenview, IL, U.S.A. This technical center assists in providing engineering ideas and solutions for worldwide markets. Combined with our own specialized staff at our Montgomeryville headquarters, we offer unique solutions to your application problems.

DISTRIBUTOR LOCATIONS

ARGENTINA
AUSTRALIA
AUSTRIA
BELGIUM ■ BRAZIL
CANADA
CHILE ■ CHINA
DENMARK
EGYPT
ENGLAND ■ FINLAND
FRANCE
GERMANY
HOLLAND
INDONESIA
ITALY ■ JAPAN
KUWAIT
MALAYSIA
MEXICO
NORWAY
OMAN ■ PERU
PHILIPPINES
POLAND
QATAR
SAUDI ARABIA
SINGAPORE
SOUTH AFRICA
SOUTH KOREA
SPAIN
SWEDEN
SWITZERLAND
SYRIA
TAIWAN
THAILAND
U.A.E.
UNITED STATES
VENEZUELA
VIETNAM
WEST INDIES

The Advantage

For Precise and Permanent Alignment of all Machinery

- Excellent Vibration Damping
- High Compressive & Bond Strengths
- Superior Resistance to Shrinkage, Fretting and Shear Loads
- Serviceability within 24 Hours
- Local Representation

Why choose Epoxy Grout…

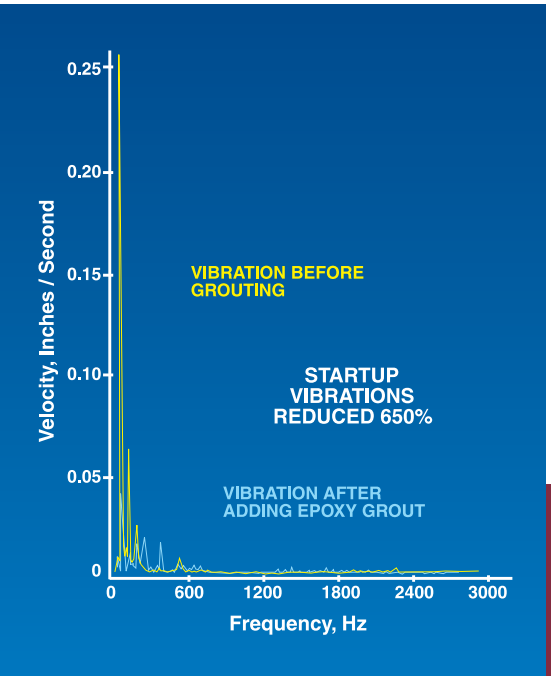
If you are interested in…

- Increasing Equipment and Foundation Service Life
- Lowering Equipment Operating Costs
- Increasing MTBF

…the choice for your next installation is ITW Philadelphia Resins.

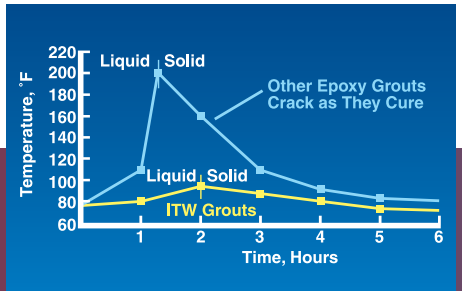
ITW Philadelphia Resins Epoxy Grout Systems provide all of the advantages necessary for superior performance including fast, convenient installations; precise, reliable alignment; resistance to thermal growth under hot-running machinery; rapid curing with negligible shrinkage; and maximum versatility for dependable solutions with the most difficult installation problems.

There is an ideal epoxy product for each grouting or chocking application. ITW Philadelphia Resins has earned an unmatched reputation for reliability with major gas pipelines; chemical, petrochemical and refining complexes; power facilities; mining operations; manufacturing; engineering and design organizations; and industrial constructors worldwide.



Excellent Vibration Dampening Efficiencies from ITW Grouts

ITW Grouts have low, gentle exothermic reactions which are less likely to crack.



Chockfast® Foundation Systems
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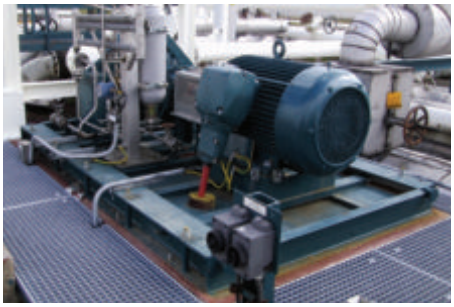
ITW Philadelphia Resins

ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems



Epoxy Grout - versus - Cement

1.	Compressive Strength 15300 – 19000 psi.	3000 – 6000 psi.
2.	Tensile Strength 1890 – 4970 psi.	400 – 600 psi.
3.	Will not shrink in liquid or solid state.	Can shrink in liquid and / or solid state.
4.	Impervious to most liquids, chemicals, lubricants and freeze / thaw cycles.	Can be affected by all.
5.	Rapid cure 24 – 36 hrs. at 70 degrees F.	Slow curing, 7-21 days.
6.	Extremely high bond strength to steel and concrete.	Low bond strength.
7.	No components to measure.	Must adjust water for flowability & strength.
8.	Epoxies can be poured from 1/4” - 18” thick in one layer.	Must be pumped in tight clearances.

Advantages of Epoxy Grout

1. **Usage in corrosive and external applications.**
2. **Limited down time during outages and emergencies.**
3. **High bond strength dampens vibration thus extending the life of machinery components.**
4. **Excellent flowability insures maximum bearing contact.**
5. **Support by local distributor in all aspects of grouting.**

ESCOWELD®
Industrial Grouts and Polymers
by ITW Philadelphia Resins

Which Product is Right for You?

When reliability cannot be compromised.

ITW Philadelphia Resins gives you superior choices with Chockfast® Foundation Systems and Escoweld® Industrial Grouts & Polymers

Chockfast Red	A 3-component, 100% solids, deep-pour, multi-purpose epoxy grout for fast, permanent alignment of reciprocating equipment. Also used as a polymer concrete for fast reconstruction of worn or damaged foundations. Chockfast® Red provides excellent vibration damping for static and dynamic loads, while its gentle exothermic cure allows for single pours from 2" to 18" (51 mm to 457 mm).
Chockfast Red SG	A 3-component, 100% solids, enhanced flow, epoxy grout, Chockfast Red SG is used to grout large machinery applications where a lighter consistency material is required and clearances from 1" to 3" (25 mm to 76 mm) are typical.
Escoweld 7505/7530	A 3-component, 100% solids, deep pour, epoxy grout; ESCOWELD® 7505/7530 offers many benefits designed to simplify equipment installation while providing excellent chemical resistance and vibration damping for pumps and other critically aligned rotating equipment. Pours from 2" to 18" (51 mm to 457 mm) are typical. ESCOWELD® is available in North America only.
CWC 604 Machine Bond	A 3-component, 100% solids, deep pour, epoxy grout; CWC 604 Machine Bond® offers many of the same benefits characteristic of our other fine epoxy grouts, but where a lighter consistency material is required. Pours from 1" to 18" (51 mm to 457 mm) are typical. CWC 604 Machine Bond® is available in North America only.
Chockfast Blue	3-component, 100% solids, high chemical and temperature-resistant, high flow epoxy grout for new or retrofit installations in caustic environments. Chockfast® Blue can also be used as a substitute for steel soleplates or rails; normally used in a thickness range of 1" to 1-1/2" (25 mm to 38 mm).
Chockfast Orange	2-component, low viscosity, structural epoxy "chock", or "poured shim" with variable hardener ratios options. Replaces tediously fitted steel chocks or shims. Assures intimate contact with machined or un-machined equipment bedplates. Virtually 100% effective bearing underneath supported equipment. Normally poured in thickness' of 1-1/4" to 2-1/2" (32 mm to 64 mm).
Chockfast Black	2-component, highly flowable, thin pour "chock" or "poured shim"; designed to maintain proper alignment and support of machinery and equipment. Able to withstand severe industrial environments with a high degree of both physical and thermal shock resistance. Normally poured in thicknesses of 1/2" to 1" (13 mm to 25 mm).
Chockfast Gray	Highly flowable, two-component, thin pour "chock" designed to maintain proper alignment and support of machinery and equipment; able to withstand severe industrial environments with a high degree of both physical and thermal shock resistance.
ITW Quickset	2-component, high-strength, fast-setting, multi-purpose epoxy with a convenient mixing ratio of 1:1. Can be used as a liquid shim, an anchoring adhesive or as structural gap filler. Sets within 15 minutes, with full cure in 6 hours. Hardens to 78 Shore D in 30 minutes and 84 Shore D in 4 hours. Normally poured in thickness' up to 3/4" (19 mm).
ITWPRC 100 Non-Shrink Cementitious Grout	A precision, non-shrink, cement grout that meets or exceeds all requirements of the Corps of Engineers CRD C-621 and ASTM C-1107.

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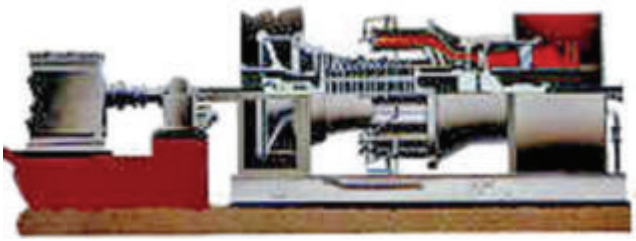
ITW Philadelphia Resins

ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems



The Chockfast® and Escoweld® Epoxy grouting systems have been specifically engineered to provide the optimal performance and reliability for use under critically aligned equipment.

The right grouting system, as part of a well engineered equipment system, can provide years of cost effective, reliable performance. Selecting the right grouting system is as simple as having an understanding about what the ITW Philadelphia Resins Chockfast® and Escoweld® Epoxy Grout Systems provide.

Chockfast® has a long successful history in the natural gas transmission industry. The "Chockfast® System" supports more horsepower than all other systems combined. Escoweld® enjoys an excellent reputation in the world of pumps with its improved chemical resistance to many industrial chemicals and its vibration dampening capability.

From thin pour epoxy chocks to large foundation repairs, ITW Philadelphia Resins has the properly engineered system for your critical equipment needs.

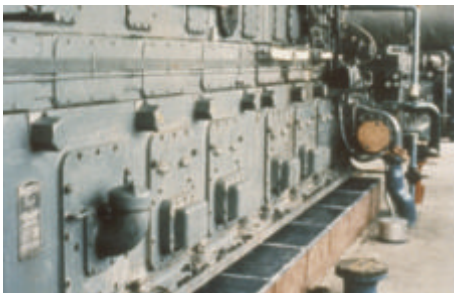
GO ON-LINE FOR INFORMATION ON OUR COMPLETE LINE OF HIGH PERFORMANCE EPOXY GROUTING SYSTEMS

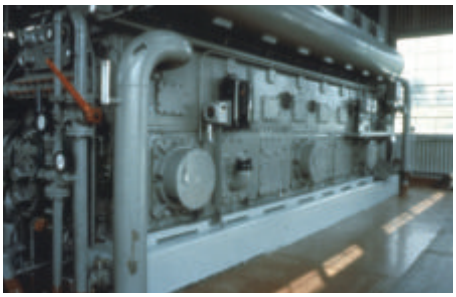
www.chockfastgrout.com
www.escoweld.com

ESCOWELD®
Industrial Grouts and Polymers
by ITW Philadelphia Resins

Proven Solutions

COMPRESSORS

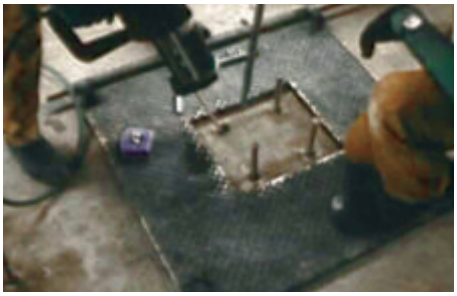




When you need a foundation that won't shake to pieces…

Reciprocating compressors present the single most common application for epoxy grouts. Because of the vibration, chemical attack, field installation issues and reliability concerns, most manufacturers prefer a solid, reliable foundation under their equipment. Decades of experience has shown that when performance of the foundation system is critical to the overall function of the equipment, polymer systems provide the best solution to the long term performance of the overall package.

CRANE RAILS



Heavy loads require a heavy-duty foundation…

Setting crane rails is greatly simplified by using epoxy grout as opposed to steel or concrete.

With higher compressive strengths and resistance freeze thaw cycles polymer products are far superior to the cement grout that is normally used for setting these rails. Most of the time the grouts will replace both the cement grout and the leveling plate found under the rail. Not only does the epoxy support the rail evenly it seals the underside of the rail from corrosives and dirt.

ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems

PIPE SUPPORTS

Because remote pipe support locations are no place to have a failure…

Epoxy pipe supports or shim blocks are the answer to your pipe inspection problems. They eliminate pipe support corrosion, fretting and vibration associated with the higher costing steel supports.

They require no maintenance and are available in 2 different styles; wedge shaped or rounded. Both models are fully adjustable and will fit just about any size pipe.

Made from the same 3 component epoxies used in the rebuilding of pipe piers, they are easily removed for pipe inspection and comply with DOT Federal regulations.

SATELLITE DISH FOUNDATIONS

When you are aiming at a target a million light years away, you'd better shoot straight…

Permanent, accurate alignment of multi-million dollar satellite dishes is just one example of where polymer grouts outperform the alternatives. Mid-service regrouting of critical equipment because of foundation degradation is just not an alternative in most of these applications. The stability, vibration attenuation and ease of installation of our foundation systems make epoxy grouts an easy decision when long-term performance is the deciding factor.

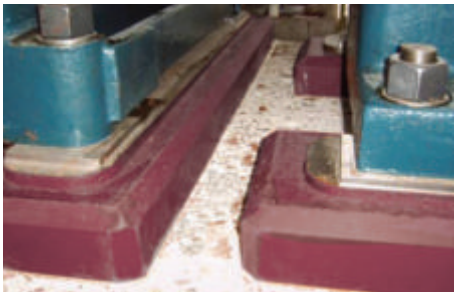
Proven Solutions

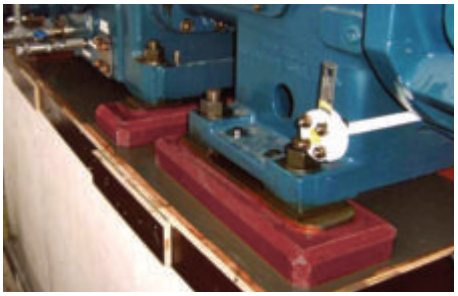
PULP & PAPER

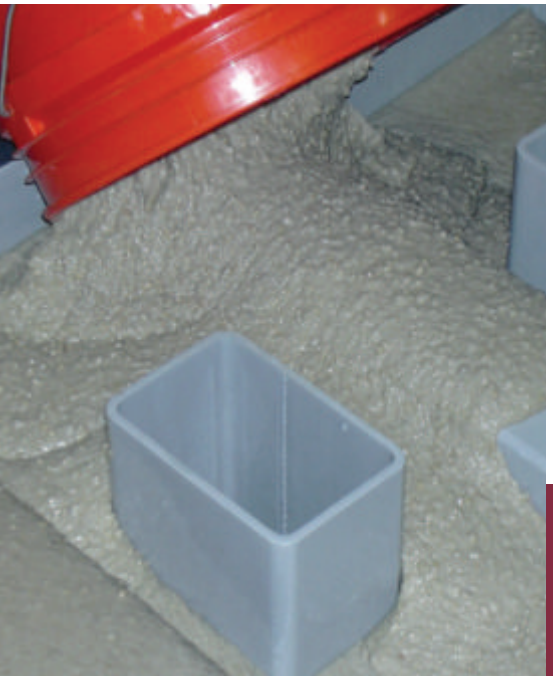
When the environment is corrosive, why use a foundation that crumbles…

The pulp and paper manufacturing environment has always presented one of the most difficult settings for the designer of equipment foundations. The constant chemical attack, the high levels of vibration and the minimal "down time" requirement of this industry have always been issues that polymer bases can easily solve. Quick cure times and high chemical resistance are inherent properties of our systems, making them ideal solutions to the never ending equipment problems caused by foundation failure in these situations.

POWER/TURBINES







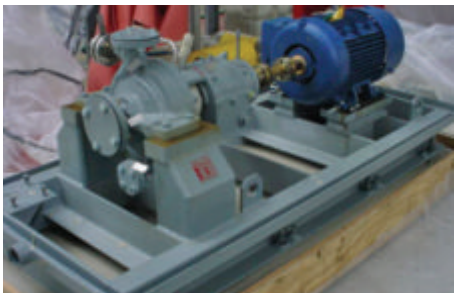
When turbines cost millions of dollars, why skimp on the foundation…

Power generation has an inherent need for reliability. Equipment costs are high and shutdown/downtime costs are even higher. The added reliability of polymer bases can only increase the already high level of dependability that is designed into these systems. Accurate alignment, a decrease in overall vibration and the longer equipment life provided by a polymer base only add to the already high level of sophistication of these power plants.

ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems

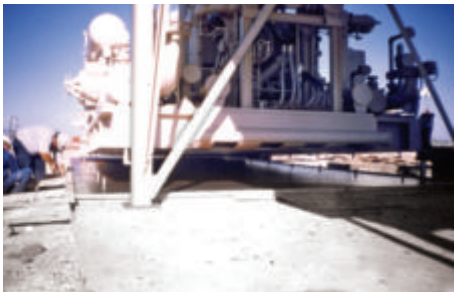
OPEN DECK GROUTING/PUMPS



Open deck grouting provides a new solution to an old problem…

By utilizing a wider, stiffer flange and support mechanism in conjunction with epoxy grout, it is now possible to level the base without removing the pump and motor. The rigidity of the base prevents any twisting or warping during shipping and handling. Setting, leveling to grade, rough alignment, and forming for first pour is possible in one day and can be done in the shop instead of a difficult field environment. In these installations the top of the polymer becomes the actual top of the baseplate.

SKIDS



Because you don't want your equipment to "skid" to a halt…

More and more equipment today is being mounted on rails or skids.

Because the design varies from unit to unit and there is no set guideline for installation, epoxy grouts should always be used to minimize the vibration levels, decrease the downtime and maximize the life cycle of the equipment mounted on those skids.

With minimum clearance and ever bigger skids Philadelphia Resins has the right high flow epoxy grout for any installation, permanent install, leased unit or temporary problem solver.

Specifications

PRODUCT	FEATURES	UNIT SIZE	MINIMUM & MAXIMUM POUR DIMENSIONS
Three-Component Epoxy Grouts			
Escoweld 7505E/7530	High Strength, Deep Pour, Very Fluid, Epoxy Grout for mounting precisely aligned equipment. Ideal for installing baseplate mounted pumps.	2.4 ft^3 (68 L)	1.25" (3 cm) to 18" (46 cm) in thickness and 7' (2.2 m) square
Chockfast Red	High strength, 100% solids epoxy grouting compound which is used to grout large machinery and to support soleplates. Ideal for final positioning of critically aligned equipment within close tolerances.	1.6 ft^3 (45.3 L)	1.25" (3 cm) to 18" (46 cm) in thickness and 7' (2.2 m) square
Chockfast Red SG	Thin Pour, Rapid Cure, High Strength Epoxy Grout	1.6 ft^3 (45.3 L)	1" (25 mm) to 4" (100 mm) in thickness and 5' (1.5 m) square
Chockfast Blue	Epoxy Grout for Severe Applications. Aggregate comes premixed with resin.	800 in^3 (13.1 L)	1" (25 mm) to 1-1/2" (38 mm) in thickness and 3'-6" (1.1 m) square
CWC 604 Machine Bond	100% solids, deep pour, epoxy grout; offers many of the same benefits characteristic of our other epoxy grouts, but where a lighter consistency material is required.	2 ft^3 (56.63 L)	1" to 18" (25 mm to 457 mm) in thickness and 7' (2.2 m) square
Two-Component Epoxy Chocking Compounds			
Chockfast Orange	Marine & Industrial Chocking Compound for Precisely Aligned Equipment with chocks of the same or variable thickness. Smooth flowing, epoxy that can be injected into very narrow areas.	Small: 120 in^3 (1.9 L) Large: 260 in^3 (4.3 L)	1/2" (12 mm) to 4" (100 mm) thick using a variable amount of hardener and 30" (800 mm) Long x 8" (200 mm) Wide
Chockfast Black	High Temperature, Industrial Chocking Compound for Precisely Aligned Equipment with chocks of the same thickness. Viscous, gritty epoxy.	265 in^3 (4.3 L)	1-1/4" (32 mm) to 2-1/2" (62 mm) thick and 30" (800 mm) Long x 8" (200 mm) Wide
Chockfast Gray	General Purpose Chocking Compound for installing Non-Precisely Aligned Industrial or Marine Equipment or for installing anchor bolts.	Small: 187 in^3 (3.06 L) Large: 816 in^3 (13.37 L)	1/2" (12 mm) to 2" (50 mm) thick and 24" (610 mm) Long x 24" (610 mm) Wide

PRODUCT	FEATURES	APPROX. UNIT SIZE	MINIMUM & MAXIMUM POUR DIMENSIONS
Cementitious Grout			
ITW PRC 100	Non-shrink, precision cement-based grout that can be used in a wide range of consistencies from damp pack to high fluidity	Plastic 0.43 $ft.^3$ Flowable 0.44 $ft.^3$ Fluid 0.45 $ft.^3$	Up to 2" (50 mm) deep. 2" to 5" deep with 25% 3/8" pea gravel by weight. Over 5" deep, use 50% 3/8" pea gravel by weight.
ITW Quickset	2-component, high-strength, fast-setting, multi-purpose epoxy with a convenient mixing ratio of 1:1. Can be used as a liquid shim, an anchoring adhesive or as structural gap filler. Sets within 15 minutes, with full cure in 6 hours.	300 ml x 300 ml Cartridge: 37 in^3 (600 ml) 2 gal 435 in^3 (7.1 L) 10 gal: 2,282 in^3 (37.4 L) 110 gal: 21,131 in^3 (346.3 L)	Up to 3/4" (Up to 19 mm) in thickness and 18" (457 mm) square

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ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems

COMPRESSIVE STRENGTH	COMPRESSIVE MODULUS OF ELASTICITY	FLEXURAL STRENGTH	COEFFICIENT OF LINEAR THERMAL EXPANSION
14,000 psi (984 kg/cm²)	1,800,000 psi (126,550 kg/cm²)	4,700 psi (329 kg/cm²)	14.6 x 10^{-6} in/in/˚F
15,250 psi (1,072 kg/cm²)	2,000,000 psi (140,600 kg/cm²)	4,025 psi (283 kg/cm²)	11.2 x 10^{-6} in/in/˚F
18,120 psi (1,274 kg/cm²)	1,970,000 psi (138,535 kg/cm²)	4,800 psi (340 kg/cm²)	19.4x 10^{-6} in/in/˚F
19,000 psi (1,336 kg/cm²)	1,640,000 psi (115,300 kg/cm²)	4,920 psi (345 kg/cm²)	27.7 x 10^{-6} in/in/˚F
16,100 psi (1132 kg/cm²)	3,800,000 psi (267,166 kg/cm²)	7,880 psi (554 kg/cm²)	16.0 x 10-6 in/in/°F

		SHRINKAGE	MAXIMUM SERVICE TEMP
19,000 psi (1,336 kg/cm²)	533,000 psi (37,482 kg/cm²)	0.0002 in/in (0.0002 mm/mm) or 0.02%	194˚F (90˚C)
17,300 psi (1216 kg/cm²)	800,000 psi (56,246 kg/cm²)	0.00018 in/in (0.00018 mm/mm)	200˚F (94˚C)
16,000 psi (1,125 kg/cm²)	520,000 psi (36,568 kg/cm²)	0.0003 in/in (0.0003 mm/mm)	125˚F (52˚C)

COMPRESSIVE STRENGTH (PSI)				COMP. MODULUS OF ELASTICITY	FLEXURAL STRENGTH		COEFFICIENT OF LINEAR THERMAL EXPANSION
	Plastic	Flowable	Fluid				
3 days	5,900	5,400	4,800	3 days 2.64 x 106 psi	3 days	1,055 psi	4.76 x 10-6 in/in˚F
7 days	8,900	7,700	6,200	7 days 2.79 x 106 psi	7 days	1,230 psi	
28 days	11,500	8,400	7,700	28 days 3.00 x 106 psi	28 days	1,430 psi	
14,500 psi (101.5 MPa)				347,000 psi (2392.5 MPa)	15,400 psi (106.18 MPa)		

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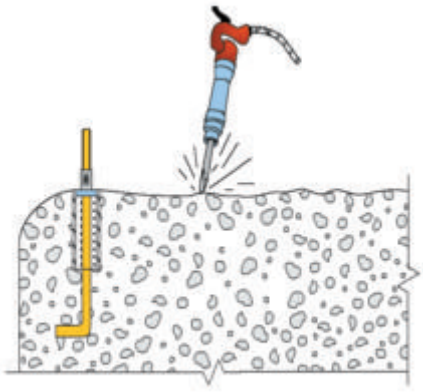
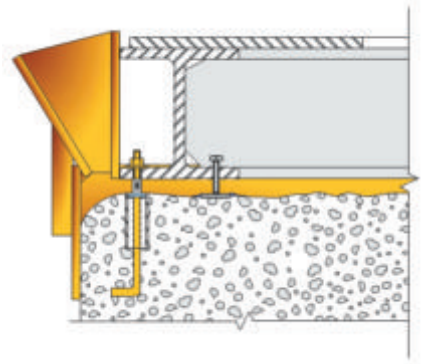
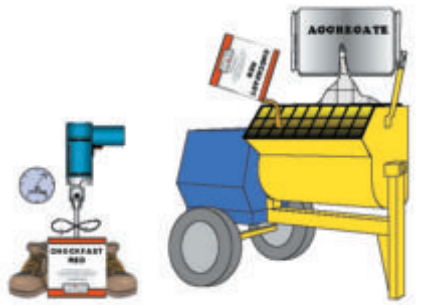
Typical Installation Steps for Epoxy Grout



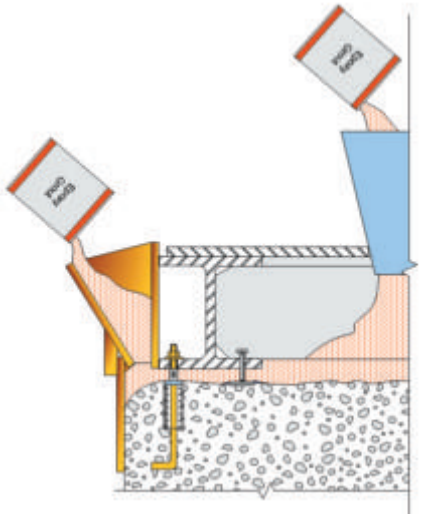
- After the concrete is fully cured, chip the foundation down 3/4 - 1" using a light duty, hand held pneumatic chipper with a chisel type tool, removing all laitance and defective or weak concrete.
- Chamfer all the foundation edges at a 45˚ angle, in order to remove stress concentration.
- Remove all dust, dirt, chips, oil, water, and any other contaminants.
- The final baseplate or soleplate elevation should allow 2" to 3" of grout between the surface of the foundation and the lower baseplate flange or the underside of the soleplate.
- Fill the foundation anchor bolt sleeves with a non-bonding, pliable material, such as spray insulation foam to prevent the epoxy grout from filling the anchor bolt sleeve. Apply tape to the shanks and threads of all anchor bolts.



- Build grout forms out of 3/4" thick plywood securely braced with 2x4's. Forms must be liquid-tight. Seal off any open spaces or cracks in forms, or at the joint between forms and the foundation using RTV sealant. Install 45˚chamfer strips along the top inside edges of the form at the final elevation of the grout as well as in all vertical corners.
- Install expansion joints as required depending on the length of pour and specific grout chosen.
- Coat the inside of the forms with three coats of paste wax on all areas that will come in contact with the grout to keep the grout from bonding to the forms.
- Install and align the baseplate without any pumps or motors installed using jacking bolts. Jacking bolts should fall on round metal landing pads epoxied to the surface of the concrete. Apply a heavy coat of non-melt grease to the jacking screws so they can be removed later.



- Mix the epoxy resin and hardener with a Jiffy Mixer for about three [3] minutes. Pour the mixed solution into a wheelbarrow, mortar box, or mechanical mortar mixer.
- Slowly add aggregate to the mix one bag at a time. Mix the resin and aggregate only long enough to wet out all the aggregate.



- Grouting should be continuous until all sections or compartments of the baseplate are completely filled. A head box can provide a hydraulic head to force the grout to the vent holes.
- The use of a head box provides a surge volume for the grout, as well as provides the critical hydraulic head.
- Tools and equipment can be cleaned with medium pressure water immediately upon completion.
- Forms may be removed when the epoxy grout is adequately cured. This generally occurs in approximately 24 hours at 72˚ F when the surface becomes firm and not tacky to the touch.
- The baseplate is to remain supported by the jack screws for 48 hours before removing them. The jack screw holes shall be filled with RTV or epoxy after being solvent cleaned to remove any bond breaker. 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.
- Re-install the pumps and motors after the baseplate has been grouted and after the grout has cured for a minimum of twenty-four (24) hours.

ITW POLYMER TECHNOLOGIES

Industrial Grouts, Polymers and Foundation Systems

ITW Polymer Technologies represents the cutting edge of products that deal with epoxy or polymer systems. In addition to the field installed grouting products discussed in this brochure, a number of other product offerings are available to address your needs.

ITW Resin Technologies

www.itwresintech.com

The IMPAX line of coatings that this segment offers provides solutions to you most difficult industrial coatings needs. The product line presents a complete solution to your flooring or secondary containment concerns.

Self-Leveling Flooring Products
These systems offer high-solids, chemically impervious, abrasion resistant and aesthetically pleasing answers to your most difficult flooring problems.

Industrial Resurfacers
These systems provide the ultimate in flooring performance. When chemical attack, intense traffic or other highly abusive environment cause concern, these products are the solution.

Thin Film Coatings
Products in this line include epoxy and urethane systems that provide for low-cost, easily applied coatings that will improve the appearance of your facility.

Anti-Slip Systems
When safety is the primary concern, our complete line of skid-resistant products are second to none. Developed primarily to exacting military standards, they provide the ultimate solution to slip and fall concerns in industrial environments.

Decorative Systems
Impax flake or quartz systems provide the ultimate compromise between industrial toughness and commercial appeal.

Secondary Containment Systems
Regulations that require complete containment of chemicals continue to challenge engineers in industrial facilities. These products can provide solutions to some of these difficult challenges.

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ITW Polymer Technologies

Product Technical Bulletins

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Which Product is Right for Your Application?

Engineered Grouts & Chocking Compounds

Product	Description
Chockfast Red	A 3-component, 100% solids, deep-pour, multi-purpose epoxy grout for fast, permanent alignment of reciprocating equipment. Also used as a polymer concrete for fast reconstruction of worn or damaged foundations. Chockfast® Red provides excellent vibration damping for static and dynamic loads, while its gentle exothermic cure allows for single pours from 2" to 18" (51 mm to 457 mm).
Chockfast Red SG	A 3-component, 100% solids, enhanced flow, epoxy grout, Chockfast Red SG is used to grout large machinery applications where a lighter consistency material is required and clearances from 1" to 2 " (25 mm to 51 mm) are typical.
ESCOWELD 7505/7530	A 3-component, 100% solids, deep pour, epoxy grout; ESCOWELD® 7505/7530 offers many benefits designed to simplify equipment installation while providing excellent chemical resistance and vibration damping for pumps and other critically aligned rotating equipment. Pours from 2" to 18" (51 mm to 457 mm) are typical.
CWC 604 Machine Bond	A 3-component, 100% solids, deep pour, epoxy grout; CWC 604 Machine Bond ® offers many of the same benefits characteristic of our other fine epoxy grouts, but where a lighter consistency material is required. Pours from 1" to 18" (51 mm to 457 mm) are typical. CWC 604 Machine Bond ® is available in North America only.
Chockfast Blue	3-component, 100% solids, high chemical and temperature-resistant, high flow epoxy grout for new or retrofit installations in caustic environments. Chockfast® Blue can also be used as a substitute for steel soleplates or rails; normally used in a thickness range of 1" to 1 ½" (25 mm to 38 mm).
Chockfast Orange	2-component, low viscosity, structural epoxy "chock", or "poured shim" with variable hardener ratios options. Replaces tediously fitted steel chocks or shims. Assures intimate contact with machined or un-machined equipment bedplates. Virtually 100% effective bearing underneath supported equipment. Normally poured in thickness' of 1-1/4" to 2-1/2" (32 mm to 64 mm)
Chockfast Black	2-component; filled structural epoxy "chock" or "poured shim"; used to support and maintain permanent frame alignment under hot-running machinery. Elevates equipment, allowing a vent space between equipment and foundation to lower foundation temperatures and minimize upward thermal growth. Virtually 100% effective bearing underneath supported equipment. Normally poured in thicknesses of 1-1/4" to 2-1/2" (32 mm to 64 mm).
Chockfast Gray	2-component, highly flowable, thin pour "chock" or "poured shim"; designed to maintain proper alignment and support of machinery and equipment. Able to withstand severe industrial environments with a high degree of both physical and thermal shock resistance. Normally poured in thicknesses of ½" to 1" (13 mm to 25 mm).
ITW Quickset	2-component, high-strength, fast-setting, multi-purpose epoxy with a convenient mixing ratio of 1:1. Can be used as a liquid shim, an anchoring adhesive or as structural gap filler. Sets within 15 minutes, with full cure in 6 hours. Hardens to 78 Shore D in 30 minutes and 84 Shore D in 4 hours. Normally poured in thickness' up to ¾". (19mm)
ITW PRC 100 Non-Shrink Grout	A precision, non-shrink, cement grout that meets or exceeds all requirements of the Corps of Engineers CRD C-621 and ASTM C-1107.

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EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST Red

A Deep-Pour Epoxy Grout

Technical Bulletin # 617R

Product Description

CHOCKFAST Red is a three-component, high strength, 100% solids, epoxy grouting compound used to grout large machinery and to support soleplates in all types of foundations. CHOCKFAST Red has an extremely high compressive strength. This along with negligible shrinkage makes it ideal for installing critically aligned machinery within very close tolerances.

Use & Benefits

CHOCKFAST Red has the following advantages when compared to conventional cement grouts:

- Impervious to oil
- Cures at least three times as quickly
- No mixing ratios to measure
- Grouts machinery in final aligned position
- High physical strength
- High impact strength
- Resistance to many more chemicals
- Strong bond to metal and concrete
- Unaffected by weathering and freeze / thaw cycling
- Stated physical properties assured
- Superior resistance to fatigue

Design Considerations

CHOCKFAST Red is quick curing, relative to cement grouts, but the cure is thermally gentle. This allows thick pours to be made without causing the stress cracks often associated with a hot-curing epoxy grout. CHOCKFAST Red may be used in thickness greater than 2 inches (50mm), however, individual pours should generally not exceed 18 inches (46cm) in thickness and 7 feet (2.2m) in length. When grouting critically aligned machinery coupled to another machine, it is advisable to limit the final leveling pour in accordance with the instructions in Bulletin No. 615 (latest revision).

CHOCKFAST Red contains no diluents that could interfere with the curing mechanism or that could cause material loss during or after cure. Therefore, machinery may be positioned at its final elevation before pouring because the shrinkage is negligible. Critical alignments are maintained during machinery operation due to its high dimensional stability and resistance to creep and vibration.

Application Instructions

CHOCKFAST Red may be mixed with contractor's hoe and wheelbarrow or in a small portable mortar mixer. Pre-condition resin, hardener and aggregate to 65°-80°F (18°-27°C) for 48 hrs. before mixing. Thoroughly mix hardener with resin first before mixing in aggregate. Where a very flowable mix is required the aggregate content may be reduced accordingly. However, in load-bearing areas a maximum reduction to 3-1/2 bags is recommended. Please contact the CHOCKFAST Distributor or ITW Polymer Technologies if less than 3-1/2 bags are being considered. See Bulletin No. 642 for mixing and installation procedures.

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www.chockfastgrout.com

Physical Properties

COMPRESSIVE STRENGTH	15,250 psi (1,072 kg/cm^2)	ASTM C-579 MOD
COMPRESSIVE MODULUS OF ELASTICITY	2,000,000 psi (140,600 kg/cm^2)	ASTM C-579 MOD
LINEAR SHRINKAGE	Not Measurable	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	11.2 x 10^{-6}/ ^{o}F @ 32^{o}F to 140^{o}F (20.1 x 10^{-6}/ ^{o}C @ 0^{o}C to 60^{o}C)	ASTM D-696
FLEXURAL STRENGTH	4,025 psi (283 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	2,000,000 psi (140,600 kg/cm^2)	ASTM C-580
TENSILE STRENGTH	1,890 psi (133 kg/cm^2)	ASTM D-638
IZOD IMPACT STRENGTH	4.6 in.lb/in. (0.02 N.m/mm)	ASTM D-256
SERVICE TEMPERATURE	Up to 140^{o}F (60^{o}C)	
FIRE RESISTANCE	Self-Extinguishing	ASTM D-635
SPECIFIC GRAVITY	2.06	

Product Information

UNIT COVERAGE	1.6 ft^3 or 2,765 in^3 (45.3 Liters)
APPLICATION TEMPERATURE	55^{o}F (13^{o}C) to 95^{o}F (35^{o}C)
UNIT PACKAGING	Resin (NH): 1.6 gal (6.1 L) in a 3 gal pail Hardener (NH): 0.9 gal (3.5 L) in a plastic tray inserted into the top of the resin can Aggregate: (4) 46 lb. (21 kg) bags
UNIT WEIGHT	Resin: 15.4 lbs (7 kg) Hardener: 7.6 lbs (3.4 kg) Aggregate: 184 lbs (84 kg)
SHIPPING WEIGHT	207 lbs (94 kg)
CURE TIME (approximate)	54 hours @ 60^{o}F (16^{o}C); 36 hours @ 72^{o}F (21^{o}C) 24 hours @ 27^{o}C (80^{o}F); 18 hours @ 32^{o}C (90^{o}F)
POT LIFE	Approximately 3 hours @ 21^{o}C (70^{o}F)
SHELF LIFE	2 years in dry storage
CLEAN UP	Water or IMPAX IXT-59 or similar epoxy solvent

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST® Red SG

Thin Pour, Rapid Cure, High Strength, Epoxy Grout

Technical Bulletin # 618 I

Product Description

CHOCKFAST RED SG is a three component, high strength, 100% solids epoxy grouting compound which is used to grout large machinery and to support soleplates in all types of foundation designs with clearances as little as 1" (25mm). CHOCKFAST RED SG has extremely high physical properties and negligible shrinkage, making it ideal for final positioning of critically aligned equipment within close tolerances. Skid mounted compressors, extruders, turbines, pumps, motors and crane rails are just a few types of equipment supported on CHOCKFAST RED SG. When using CHOCKFAST RED SG for crane rail applications expansion joints may be placed every 10' (3m).

Use & Benefits

CHOCKFAST RED SG has the following advantages when compared to conventional cementitious grouts:

- Impervious to oil and chemical attack
- Pre-packaged unit
- Higher physical strengths
- Unaffected by weathering and freeze/thaw cycling
- Cures at least three times as quickly
- Grout machinery in final aligned position
- Strong bond to metal and concrete
- Superior resistance to fatigue

CHOCKFAST RED SG contains no non-reactive diluents which could interfere with the curing mechanism or which could cause material loss during or after cure. Machinery may be positioned at its final elevation before pouring because the shrinkage is negligible. Critical alignments are maintained during machinery operation due to CHOCKFAST RED SG's high dimensional stability and resistance to creep and vibration.

Design Considerations

For design considerations and application details, please request Bulletin No. 643 or contact ITW Polymer Technologies' Engineering Services Department.

Application Instructions

CHOCKFAST RED SG may be mixed with a contractor's hoe and wheelbarrow or in a portable mortar mixer. Thoroughly mix hardener with resin first before mixing in aggregate. Where a very flowable mix is required, the aggregate content may be reduced accordingly. Contact the CHOCKFAST Representative or ITW Polymer Technologies when reducing aggregate.

CHOCKFAST RED SG is quick curing relative to cement grouts, but the cure is thermally gentle. This allows thick pours to be made without causing the stress cracks often associated with a hot curing epoxy grout. CHOCKFAST RED SG may be used in any thickness greater than 1" (25mm); however, individual pours should generally not exceed 4" (100mm) in thickness and 5' (1.5m) in length.

CHOCKFAST RED SG cure rates and flowability will be enhanced somewhat if material temperatures are warmer than the existing ambient conditions listed above. It is always a good idea to keep CHOCKFAST RED SG materials in a well-protected area until the job site is fully prepared for mixing and placement.

NOTE: Standard CHOCKFAST RED is available and allows deep single pours to 18" (450mm) for concrete reconstruction. Please see Bulletins No. 642 and 617.

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688
www.chockfastgrout.com

Physical Properties

COMPRESSIVE STRENGTH	18,120 psi (1174 kg/cm^2)	ASTM C-579 (MOD)
COMPRESSIVE MODULUS OF ELASTICITY	1.97 x 10^6 psi (138535 kg/cm^2)	ASTM C-579 (MOD)
LINEAR SHRINKAGE	Not Measurable	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	10.8 x 10^{-6}/ ^{o}F @ 32^{o}F to 140^{o}F (19.4 x 10^{-6}/ ^{o}C @ 0^{o}C to 60^{o}C)	ASTM D-696
FLEXURAL STRENGTH	4,800 psi (340 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	2.62 x 10^6 psi (184,200 kg/cm^2)	ASTM C-580
TENSILE STRENGTH	2,130 psi (150 kg/cm^2)	ASTM D-638
IZOD IMPACT STRENGTH	7.2 in.lbs./in. (0.32 Newton m/cm)	ASTM D-258
FIRE RESISTANCE	Self-extinguishing	ASTM D-635
SERVICE TEMPERATURE	Up to 140^{o}F (60^{o}C)	
SPECIFIC GRAVITY	2.24	

Product Information

COVERAGE	1.6 ft^3 (45.3 Liters)
APPLICATION TEMPERATURE	55^{o}F (13^{o}C) to 95^{o}F (35^{o}C)
UNIT PACKAGING	Resin (NH): 2.59 gal (9.05 L) in a 3 gal pail Hardener (H): 0.43 gal (1.63 L) in a 1gal can Aggregate: (4) bags - 46 lb. (21 kg) / bag
UNIT WEIGHT	Resin: 23.3 lbs. (10.6 kg) Hardener: 3.6 lbs. (1.6 kg) Aggregate: 184 lbs (84 kg)
SHIPPING WEIGHT	213 lbs. (96.6 kg)
CURE TIME (approximate)	24 to 48 hours @ 70^{o}F (21^{o}C)
POT LIFE	1 hour @ 70^{o}F (21^{o}C)
CLEAN UP	IMPAX IXT-59 or similar epoxy solvent
SHELF LIFE	Two years in dry storage

Reference

For design considerations and application details please request Bulletin No. 642 or contact ITW Polymer Technologies' Engineering Services Department.

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

ESCOWELD® 7505E/7530

High Strength, Very Fluid, 3-Part Epoxy Grout

Technical Bulletin # 1612D

Product Description

ESCOWELD 7505E/7530 is a highly flowable, epoxy grout system engineered for use with dynamically - operated industrial machinery and equipment where performance and operating reliability are crucial. ESCOWELD grout functions as a critical interface between the equipment and its foundation ensuring proper transference of static and dynamic loads generated by operating equipment to the foundation. This allows the foundation to efficiently absorb and dissipate the loads true to its purpose.

ESCOWELD Epoxy Grout provides proper support for the operating equipment. When coupled with a properly designed anchoring system, ESCOWELD grout maintains critical shaft alignment fundamental for optimum performance of rotating and reciprocating equipment.

ESCOWELD 7505E/7530 also offers improved resistance to many industrial chemicals that would typically destroy conventional cement grouts. A foundation too, is subject to chemical attack. If the foundation mass is reduced by chemical attack, so is its effectiveness as a support and damping mechanism. Using guidelines available from ITW Philadelphia Resins, ESCOWELD grout can also be used to protect concrete foundations from chemical attack that would otherwise deteriorate as a result.

Use & Benefits

The key to the performance of ESCOWELD 7505E/7530 is the combination of ESCOWELD 7505E, a versatile liquid epoxy resin/hardener system, with ESCOWELD 7530, a engineered silica aggregate specifically designed for greater flowability, strength and self-leveling characteristics. Other unique features and benefits that have been offered for over 20 years with ESCOWELD 7505 include:

- Excellent bondability to itself without surface preparation to simplify multiple pour projects.
- Wide range of depth of pour, from 1-1/2” to 18”. This simplifies and speeds up many jobs that would otherwise have required multiple pours and additional surface preparation.
- Cures in 24 hours which is especially valuable during tight turn-around schedules or emergency repairs.
- Exceptional dimensional stability as well as excellent resistance to chemical and physical degradation.
- Negligible shrink on cure.

Design Considerations

For optimum results, follow the recommendations closely for site preparation, grout mixing, grout placement, and grout finishing, etc. found in “ESCOWELD 7505E/7530 Installation Procedures, Bulletin No. 1600.

Application Instructions

The performance of any epoxy machinery grout system depends not only on the engineering and physical characteristics of the cured grout, but also on the quality of the mixing and installation. Proper mixing of all components is particularly important in obtaining the maximum strength and adhesive characteristics of epoxy grouts.

- ESCOWELD 7505E is packaged in a single can. Lower portion contains Epoxy Resin and upper portion contains the converter. Pour entire contents of converter into the Epoxy Resin container and mix properly.
- Mix ESCOWELD 7530 aggregate into combined liquid components in a wheelbarrow or mechanical mixer (mortar/plaster mixer) until all dry particles are wetted out.

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688

Physical Properties

COMPRESSIVE STRENGTH	14,000 psi (984 kg/cm^2) (Actual field strength may vary, from 10,000 to 14,000 psi depending on curing and testing conditions)	ASTM C-579 MODIFIED
COMPRESSIVE MODULUS OF ELASTICITY	1.8 x 10^6 psi (1.26 x 10^5 kg/cm^2)	ASTM C-579
LINEAR SHRINKAGE	0.036% (.00036 in/in)	ASTM D-2568
COEFFICIENT OF LINEAR THERMAL EXPANSION	26.2 1 x 10^{-6}/ ^{o}C @ 0^{o}C to 60^{o}C (14.6 x 10^{-6} / ^{o}F @ 32^{o}F to 140^{o}F)	ASTM C-531
FLEXURAL STRENGTH	4,700 psi (329 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	1.8 x IO^6 psi (1.26 x 105 kg/cm^2)	ASTM C-579
TENSILE STRENGTH	2,100 psi (147 kg/cm^2)	ASTM D-307
ADHESIVE BOND TO STEEL	2,100 psi (147 kg/cm^2)	ASTM C-307
IZOD IMPACT STRENGTH		ASTM D-258
FIRE RESISTANCE	Self Extinguishing	ASTM D-637
SERVICE TEMPERATURE	Up to 140^{o}F (60^{o}C)	
SPECIFIC GRAVITY		
DENSITY	125 lbs/cu ft (1948 kg/cu meter)	

Product Information

COVERAGE	2.4 cu.ft. (68 liters)
APPLICATION TEMPERATURE	55^{o}F To 90^{o}F (13^{o}C to 32^{o}C)
CURE TIME (approximate)	12 hours @ 90^{o}F (32^{o}C) 24 hours @ 80^{o}F (27^{o}C) 36 hours @ 70^{o}F (21^{o}C) 38 hours @ 60^{o}F (16^{o}C)
POT LIFE	2 Hours @ 77°F (25°C)
CLEAN UP	Water or IMPAX IXT-59 Solvent
UNIT PACKAGING	Resin (NH): 2.6 gal (9.8 L) in a 5 gal bucket Hardener (NH): 1.2 gal (4.6 L) in a plastic tray inserted into the top of the resin can Aggregate: (5) 53 lb. (24 kg) bags
UNIT WEIGHT	Resin: 25.7 lbs (11.7 kg) Hardener: 10.2 lbs (4.2 kg) Aggregate: 265 lbs (120 kg)
SHIPPING WEIGHT	305 lbs (138 kg)
SHELF LIFE	2 years

Date 09/2005

EQUIPMENT FOUNDATION SYSTEMS

CWC Industrial

CWC 604 Machine Bond®

Three-Component Epoxy Grout

Technical Bulletin # 1104

Product Description

CWC 604 Machine Bond is a three-component, 100% solids, epoxy resin grout specifically formulated for grouting heavy machinery, engines and production equipment. It is designed to resist vibration, chemical attack, high torque loads and the various stresses associated with such installations.

Features:

- Excellent physical properties
- Flowable, self leveling
- Low exothermic cure
- Deeper monolithic pours (18"+)
- Extended placement time
- Easy water clean-up

Basic Uses

- Heavy machinery
- Compressors and engines
- Production equipment
- Auxiliary equipment

Installation Method

Pour in place, self-leveling.

Package & Yield

A unit of CWC 604 Machine Bond consists of three components: Two liquids (Part A - resin, Part B - hardener) and an aggregate (Part C). Parts A and B are packaged in a two-component five gallon pail, and Part C is packaged in four 60 pound bags.

Yield	2 cubic feet (0.057 cubic meters)
Shipping weight	284 pounds (129 kilograms)
Freight Classification	Acid Proof Cement

Surface Preparation

All surfaces to be bonded must be dry, sound and free from any contamination of foreign matter. Concrete surfaces should be prepared by mechanical abrasion such as chipping, bush hammering, sand blasting or similar methods. A rough surface will aid adhesion. Sandblasting is recommended in preparing metal surfaces.

Forming

CWC 604 Machine Bond is a "flowing" grout and must be retained within forms until cured. Forms must be of adequate strength, properly braced and sealed watertight against leakage. Forms must be coated with a suitable release agent, such as paste wax, to permit their removal after the grout has cured. Forms should allow for hydraulic head, as needed, to facilitate the filling of the grout bed area.

Proper Tools, Supplies and Accessories

All material and equipment for mixing, placing and clean-up should be on hand before any mixing is started. The use of a simple checklist is recommended for use by personnel involved in a CWC 604 Machine Bond installation. This list should include: rubber gloves, safety glasses, particle masks, protective clothing, electric or air drill and paddle attachment, concrete or mortar mixer and cleaning solvent. For a detailed material checklist, consult our brochure "CWC 604 Machine Bond Epoxy Resin Grout - Specifications for Installation".

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Mixing & Placing

Strict adherence to instructions printed on the container is essential. Resin and curing agent must be thoroughly mixed prior to adding the aggregate. Consult our brochure "CWC 604 Machine Bond Epoxy Resin Grout; Specifications for Installation" for detailed instructions.

All surface preparation and forming must be done before mixing procedures are started

Temperature Factors Affecting Grouting

The temperature of all components of CWC 604 Machine Bond, Parts A, B, and C, should be 75° to 90°F (23.8° to 32.2°C) before mixing to produce a readily self-leveling grout with good flowability. Mixing grout materials when their temperatures are below or at the low end of the indicated ranges adversely affects proper mixing and inhibits the flowability of the grout. Mixing grout materials when their temperatures are above or at the high end of the indicted ranges hastens the cure of the grout thus reducing the "working time". The grout materials should be stored at a temperature within the ranges indicated. Work area and substrate temperatures should also be within the recommended temperature range.

Technical Information

COMPRESSIVE STRENGTH:	16,100 psi
COMPRESSIVE MODULUS OF ELASTICITY:	3.8×10^6 psi
TENSILE STRENGTH:	3,065 psi
TENSILE MODULUS OF ELASTICITY (ASTM D638):	3.4×10^6 psi
FLEXURAL STRENGTH:	7,880 psi
FLEXURAL MODULUS OF ELASTICITY:	2.0×10^6 psi
BOND STRENGTH (ASTM C882):	2,520 psi
SHEAR STRENGTH (ASTM D732):	3,910 psi
COEFFICIENT OF LINEAR THERMAL EXPANSION (ASTM D732):	16.0×10^{-6} in/in/°F 28.8×10^{-6} mm/mm/°C
HARDNESS, SHORE D (ASTM C2240):	93
SPECIFIC GRAVITY:	1.89
POT LIFE:	3.5 hours @ 75°F
STORAGE CONDITIONS:	Store dry at 55° to 95°F, condition to 75° to 90°F prior to applying.
VISCOSITY:	Slurry consistency
SHELF LIFE:	1 year
PRECAUTION:	Caution: Eye and skin irritant (evidenced by itching, redness). Potential skin sensitizer. Avoid contact with eyes. Avoid prolonged or repeated skin contact. Do not take internally. Wash thoroughly after handling. First Aid: Eyes - flush with water for 15 minutes. Get immediate medical attention. Skin – remove contaminated clothing and excess contaminant, wash skin with soap and water. Inhalation -remove to fresh air. Ingestion – get immediate medical attention. See Material Safety Data Sheet for complete information
NOTE:	Samples cured and tested at 75°F, 14 days.

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST Blue

Epoxy Grout for Severe Applications

Technical Bulletin # 616K

Product Description

CHOCKFAST Blue is a two-component, aggregate-filled, pourable epoxy grouting compound for severe applications. This highly developed material is often used to replace steel soleplates or rails and is used as an epoxy foundation capping material that is resistant to high operating temperatures. Its unique properties permit usage directly under highly stressed machinery mounting surfaces.

Use & Benefits

Typical applications include the grouting of diesel engines, compressors, generators, gears, pumps and most other heavy equipment. CHOCKFAST Blue is unexcelled under heavy reciprocating and rotary machinery due to its excellent resistance to creep, fatigue and shock forces. It is also an excellent support surface for the CHOCKFAST Black epoxy chock.

Design Considerations

CHOCKFAST Blue is normally used in a thickness range of 1" to 1-1/2" (25-38mm). Thicker sections can be constructed with CHOCKFAST BLUE if proper layering techniques are used. Please contact ITW Polymer Technologies for additional application instructions.

Long pours should be divided into sections not exceeding 3'-6" (1.1m) in length. Longer, thicker or thinner pours are possible, but ITW Polymer Technologies should be consulted before deciding upon them. The pourable viscosity of the CHOCKFAST BLUE provides for essentially 100% surface contact. Because CHOCKFAST BLUE has negligible shrinkage, final alignment may be set before grouting.

Application Instructions

For CHOCKFAST BLUE temperatures that will be between 120°-140°F (49°-60°C) during engine operation the static loading shall not normally exceed 500 psi (35 kg/cm^2) which is perfectly practical for most machinery. Below 120°F (49°C), loads up to 2,000 psi (140 kg/cm^2) are permissible, but 1,200 psi 85 (kg/cm^2) should not be exceeded without reference to ITW Polymer Technologies, who are always available for consultation on any application.

Precondition resin and hardener to 70°-80°F (21°-27°C) for 24 hours before mixing. The hardener should be added to the resin and power mixed until a homogeneous color and texture are apparent. Because the resin is aggregate–filled, heavy duty mixing equipment is required. Mixing for 3-5 minutes with a Kol mixer or a large Jiffy mixer blade in a 3/4" drilling machine is usually sufficient.

Physical Properties

COMPRESSIVE STRENGTH	9,000 psi (1336 kg/cm^2)	ASTM C-579 MOD
COMPRESSIVE MODULUS OF ELASTICITY	1,640,000 psi (115300 kg/cm^2)	ASTM C-579 MOD
LINEAR SHRINKAGE	0.0001 in./in. (0.0001 mm/mm)	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	15.4 X 10^{-6}/F° @ 32°F to 140°F (27.7 x 10^{-6}/C° @ 0°C to 60°C)	ASTM D-698
FLEXURAL STRENGTH	4,920 psi (345 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	1.7 X 10^6 psi (120300 kg/cm^2)	ASTM C-580
TENSILE STRENGTH	3,156 psi (225 kg/cm^2)	ASTM D-640
IZOD IMPACT STRENGTH	3.4 in.lbs./in. (0.15 Newton m/cm)	ASTM D-258
FIRE RESISTANCE	Self-extinguishing	ASTM D-637
SPECIFIC GRAVITY	2.0	

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688
www.chockfastgrout.com

Product Information

COVERAGE	800 in. (^{3}13.1 Liters)
APPLICATION TEMPERATURE	55°F (13°C) to 95°F (35°C)
UNIT PACKAGING	Resin (NH): 5 gal (18.9 L) in a 5 gal pail Hardener (NH): 0.34 gal (1.3 L) in ½ gal can Aggregate is premixed in the resin
UNIT WEIGHT	Resin: 55.5 lbs (25 kg) Hardener: 2.9 lbs (1.3 kg)
SHIPPING WEIGHT	62 lbs (28 kg)
CURE TIME (approximate)	36 hrs. @ 60°F (16°C) 24 hrs. @ 72°F (21°C) 16 hrs. @ 80°F (27°C) 11 hrs. @ 90°F (32°C)
POT LIFE	35-50 minutes @ 70°F (21°C)
CLEAN UP	IMPAX IXT-59 or other epoxy solvent
SHELF LIFE	Excess of 2 years in dry storage

Reference

For design considerations and application details please request Bulletin # 640 and #642 or contact ITW Polymer Technologies' Engineering Services Department.

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST® Orange

The Premier Industrial Chocking Compound

Technical Bulletin # 1032

Product Description

CHOCKFAST ORANGE is a specially formulated 100% solids, two component inert filled casting compound developed for use as a chocking or grouting material. CHOCKFAST is designed to withstand severe marine and industrial environments involving a high degree of both physical and thermal shock. The compound is non-shrinking and has very high impact and compressive strength.

Years of successful in-service experience have shown the use of CHOCKFAST ORANGE to be a far superior yet less expensive method of establishing and permanently retaining precise equipment alignment under extreme conditions.

Use & Benefits

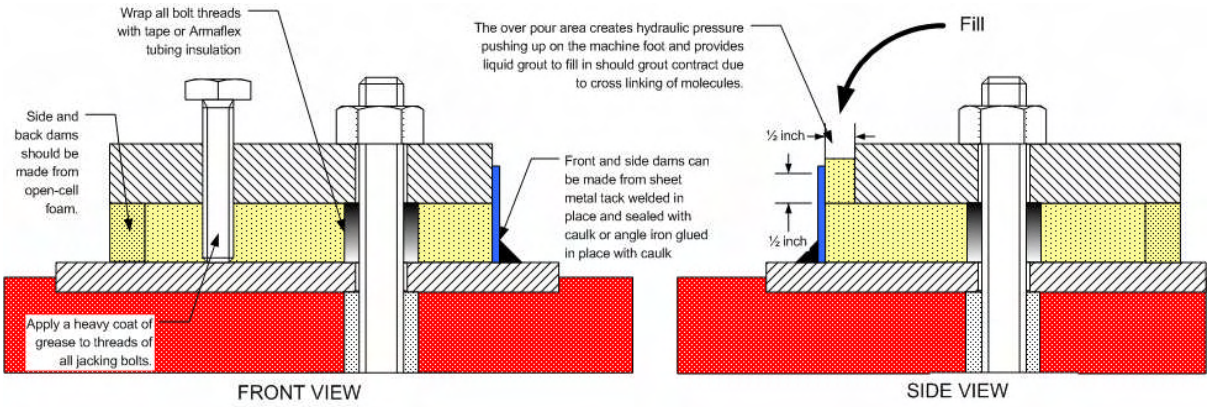
CHOCKFAST ORANGE was developed as a chocking or grouting compound for use under industrial engines and other types of machinery in depths of ½" to 4" (12mm to 100mm). The compound is used under diesel and gas engines, reduction gears, generators, compressors, pumps, bearing blocks, crane rails and numerous other applications.

CHOCKFAST ORANGE requires no special tools or special skills as does chocking with steel. When cast, CHOCKFAST ORANGE flows readily into the chock area filling voids and conforming to all irregularities. This eliminates the machining of base plates or foundations for a perfectly fitted chock.

Design Considerations

For design considerations and application details please request 642 for Industrial applications or contact ITW Polymer Technologies' Engineering Services Department.

Application Instructions



Using open-cell foam damming material, build a dam around 3 sides of the area to be chocked. Wrap the anchor bolt with tape so the Chockfast will not stick to it, Install a metal dam along the front of the chock approximately ½" to ¾" (12mm to 18mm) from the mounting flange. Seal the flange with strip caulking, or Silicone to prevent leaks. Install foam in the overpour area to the top of the mounting flange to prevent the Chockfast from leaking.

Mix the Chockfast as directed on the can. See technical Bulletin #665 to determine the proper amount of hardener to use. Slowly pour the Chockfast into one end of the overpour area and allow it to flow across and under the mounting flange.

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688
www.chockfastgrout.com

Physical Properties

COMPRESSIVE STRENGTH	19,000 psi (1,336 kg/cm^2)	ASTM D-695MOD
COMPRESSIVE MODULUS OF ELASTICITY	533,000 psi (37,482 kg/cm^2)	ASTM D-695
LINEAR SHRINKAGE	0.0002 in/in (0.0002 mm/mm) or 0.02%	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	17.1 x 10^{-6}/F° @ 32°F to 140°F (30.8 x 10^{-6}/C° @ 0°C to 60°C)	ASTM D-696
FLEXURAL STRENGTH	7,615 psi (575 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	8.6 x 10^5 psi (72,880 kg/cm^2)	ASTM C-580
TENSILE STRENGTH	4,970 psi (349 kg/cm^2)	ASTM D-638
SHEAR STRENGTH	5,400 psi (380 kg/cm^2)	FED-STD-406 (Method 1041)
IZOD IMPACT STRENGTH	6 in.lbs/in. (0.27 N.m/cm)	ASTM D-256
SHOCK RESISTANCE	Pass MIL-S-901C (Navy) High Impact Shock Test, Grade A, Type A,Class 1	
THERMAL SHOCK	Pass -0°F to 212°F (18°C to 100°C)	ASTM D-746
VIBRATION	Meets MIL-STD-167	
FIRE RESISTANCE	Self extinguishing	ASTM D-635
SPECIFIC GRAVITY	1.58	
BARCOL HARDNESS	40+ fully cured - 35 minimum	ASTM D-2583

Product Information

UNIT COVERAGE	Small Unit: 120 cu.in (1,966 cc) Large Unit: 260 cu.in (4,261 cc)
APPLICATION TEMPERATURE	55°F (13°C) to 95°F (35°C)
PACKAGING per Unit	Small Unit: Resin (NH) - 7.2 lbs. (3.3 kg), 0.53 gal (2 L) in a 1 gal can, Hardener (H) –0.5 lbs. (0.23 kg), 7.7 oz (0.23 L) in an 8 oz plastic bottle Large Unit: Resin (NH) - 14.4 lbs. (6.5 kg), 0.53 gal (2 L) in a 1 gal can, Hardener (H) –0.99 lbs. (0.45 kg), 15.4 oz (0.23 L) in an 16 oz plastic bottle
UNIT SHIPPING WEIGHT	Small Unit: 9 lbs (4 kg) Large Unit: 17 lbs. (7.7 kg)
CURE TIME (approximate)	48 hours @ 60°F (15°C) 24 hours @ 70°F (21°C) 36 hours @ 65°F (18°C) 18 hours @ 80°F (26°C)
POT LIFE	30 min. @ 70°F (21°C)
SHELF LIFE	2 years
CLEAN UP	IMPAX IXT-59 or similar epoxy solvent

Reference

For design considerations and application details please request Bulletin No. 642 or contact ITW Polymer Technologies' Engineering Services Department.

Date

02/2007

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST® Black

High Temperature Chocking Compound

Technical Bulletin # 666H

Product Description

CHOCKFAST® Black is a specifically formulated 100% solids, inert filled casting compound developed for use as a chocking material. It is a cost-effective method of maintaining permanent precise alignment of critical equipment. It will withstand severe environments involving high physical and thermal shock.

Use & Benefits

This unique product is used under gas and diesel engines, compressors, generators, turbines, motors, pumps and various other types of equipment. CHOCKFAST® Black is ideal for use under these hot running reciprocating and rotating machines because of its excellent resistance to creep and fatigue at high operating temperatures. It is non-shrinking and has a very high impact and compressive strength. Resin chocks made with CHOCKFAST® Black reduce possible bearing or crankshaft damage because they (1) minimize heat build-up on foundations, (2) assure precise and unsurpassed contact with bedplates, and (3) provide a high coefficient of friction to help hold engines down tight. The excellent flow-ability of CHOCKFAST® Black allows it to fill voids in the chock area and conform to all surface irregularities

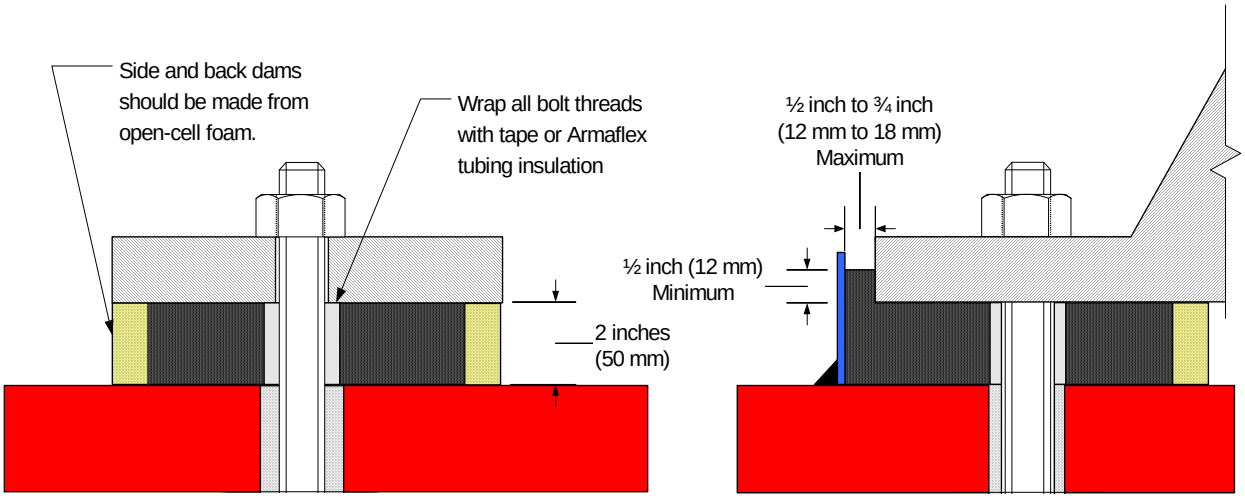
Design Considerations

CHOCKFAST® Black was designed to be a thick pour liquid chocking material. A chock depth of 2" (50mm) is standard; however, thinner or thicker pours can be made satisfactorily. The 2" (50mm) chock elevates equipment above the underlying foundation, which allows a free flow of air thereby reducing possible foundation humping problems.

Contact ITW Polymer Technologies for information regarding pours less than 1-1/4" (32mm) in thickness or greater than 2-1/2" (62mm) in thickness.

Installation Instructions

Construct a chock mold around one or more anchor bolts using open cell foam damming material on three sides. Wrap the shank of the anchor bolt with tape, cover with foam pipe insulation or coat with non-melt grease to prevent the CHOCKFAST from sticking to it and to seal the bolt hole. Place a metal dam 1/2" to ¾" (12mm to 18mm) from the mounting pad and seal with caulk. Spray the inside of the mold and front metal dam with Release Agent. Mix and pour the epoxy as directed.



ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688

Physical Properties

COMPRESSIVE STRENGTH	17,300 psi (1216 kg/cm^2)	ASTM C-695 (Modified)
COMPRESSIVE MODULUS OF ELASTICITY	800,000 psi (5.6x104 kg/cm^2)	ASTM C-695 (Modified)
LINEAR SHRINKAGE	0.00018 in/in (0.00018 mm/mm)	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	32°F to 140°F @ 15.0 X 10^{-6}/F° (27.0 x 10-6/C° @ 0°C to 60°C)	ASTM D-696
FLEXURAL STRENGTH	6,200 psi (435 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	1.4 x 10^6 psi (101,300 kg/cm^2)	ASTM C-580
TENSILE STRENGTH	2,900 psi (204 kg/cm^2)	ASTM D-638
SHEAR STRENGTH	5,000 psi (350 kg/cm^2)	FED-STD-406 (Method 1041)
IZOD IMPACT STRENGTH	5.1 in.lbs./in (0.23 N.m/cm)	ASTM D-256
FIRE RESISTANCE	Self Extinguishing	ASTM D-635
SPECIFIC GRAVITY	1.94	
BARCOL HARDNESS	55 Full Cure	ASTM D-2583
MAXIMUM OPERATING TEMPERATURE	200°F (94°C)	

Product Information

UNIT COVERAGE	265 in^3 (4,343 cm^3)
APPLICATION TEMPERATURE	55°F (13°C) to 95°F (35°C)
UNIT PACKAGING	Resin (NH) – 18.2 lbs. (8.3 kg), 1.2 gal (4.5 L) in a 2gal pail Hardener (H) – 0.74 lbs. (0.34 kg), 11.5 oz (0.34 L) in an 16 oz plastic bottle
SHIPPING WEIGHT	21 lbs. (9.5 kg)
CURE TIME (approximate)	48 hours @ 60°F (15°C) 36 hours @ 65°F (18°C) 24 hours @ 70°F (21°C) 18 hours @ 80°F (26°C)
POT LIFE	45 min. @ 70°F (21°C)
SHELF LIFE	Exceed 18 months
CLEAN UP	IMPAX IXT-59 or similar epoxy cleaner

Reference

For design considerations and application details please request Bulletin No. 642 or contact ITW Polymer Technologies' Engineering Services Department.

Date

08/2008

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST® Gray

Chocking & Anchor Bolt Setting Compound

Technical Bulletin # 656G

Product Description

CHOCKFAST Gray (PR-610FR) is a specially formulated 100% solids, two component, inert filled compound developed for use in chocking non-precisely aligned equipment or in setting anchor bolts in concrete. The compound is designed to withstand severe marine and industrial environments involving a high degree of both physical and thermal shock. The compound is non-shrinking, non-burning and has a very high impact and compressive strength. Years of successful experience have shown the use of CHOCKFAST Gray to be a far superior yet less expensive method of establishing and retaining equipment alignment under extreme conditions. When poured as a continuous chock under deck equipment, CHOCKFAST Gray provides a corrosion proof moisture seal. CHOCKFAST Gray is approved or accepted for marine use by A.B.S., Lloyd's Register and other regulatory agencies.

Use & Benefits

CHOCKFAST GRAY was developed as a chocking compound for use under marine deck machinery, pumps, generators and steering gears. Industrially, the compound is used under diesel engines, generators, compressors, pumps, turbines, bearing blocks, crane rails and numerous other applications. It is also used extensively in the setting of anchor bolts into concrete.

When used as a chocking compound for machinery, the CHOCKFAST Gray provides perfectly even support without the tedious hand packing associated with conventional cement grouts. Because the compound flows readily, much thinner cross sections can be used. The compound is also completely chemical and oil resistant, will not powder or crack with age, weathering, or freeze-thaw cycling, and will seal the mounting surfaces protecting them from deterioration. Steel soleplates and rails between the machinery and the concrete foundations are not necessary with CHOCKFAST Gray.

Other successful applications of CHOCKFAST GRAY include mounting of crane rails, chocking of crane bull gears, chocking of machine shop machinery, sealing of cable penetrations, and as a filler to dampen machinery vibrations.

Design Considerations

CHOCKFAST Gray may be used where equipment alignment does NOT have to be maintained precisely AND the equipment's normal operating temperature is below 125°F (52°C). Examples of this class of machinery include winches, pumps, skid mounted diesel generators and other self-contained equipment. CHOCKFAST Gray works best when poured at a depth of between ½" to 2" (12 mm to 50 mm). Please consult your CHOCKFAST distributor or ITW Polymer Technologies if you need to pour CHOCKFAST Gray outside of these limits.

Application Instructions

CHOCKFAST Gray requires no special tools or special skills as does chocking with steel. When cast, CHOCKFAST GRAY flows readily into chock area filling all voids and conforming to all irregularities. This eliminates the machining of base plates or foundations for a perfectly fitted chock.

To facilitate mixing and pouring, store CHOCKFAST Gray at 68° to 77°F (20° to 25°C) for 12 to 24 hours prior to mixing. Pour the entire contents of the hardener container into the resin container and power mix using a Jiffy Mixing blade at 250 to 450 RPM for 3 to 5 minutes traversing the side and bottom to ensure complete mixing. Scrape the side and bottom of the container with the mixing blade. Do not allow air to be drawn into the mixture.

Precondition the surrounding metal and/or concrete surfaces to at least 55°F (13°C). Pour the mixed CHOCKFAST Gray into the overpour area of one end of a prepared mold. Allow the epoxy to flow under the mounting foot, pushing the air out ahead of it. Fill the overpour to at least 1/2" (12mm) above the mounting foot at the highest point in the chock. Do not scrape epoxy from the sides or bottom of the container when pouring.

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688
www.chockfastgrout.com

Physical Properties

COMPRESSIVE STRENGTH	16,000 psi (1,125 kg/cm^2)	ASTM C-695
COMPRESSIVE MODULUS OF ELASTICITY	520,000 psi (36,568 kg/cm^2)	ASTM C-695
LINEAR SHRINKAGE	0.0003 in/in (0.0003 mm/mm)	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	16.8 x 10^{-6}/F° @ 32°F to 140°F (30.3 x 10^{-6}/C° @ 0°C to 60°C)	ASTM D-696
FLEXURAL STRENGTH		ASTM C-582
FLEXURAL MODULUS OF ELASTICITY		ASTM C-582
TENSILE STRENGTH	4,000 psi (281 kg/cm^2)	ASTM D-638
IZOD IMPACT STRENGTH	7.2 in.lbs./in. (0.32 N-m/cm)	ASTM D-256
FIRE RESISTANCE	Self-extinguishing	ASTM D-635
SERVICE TEMPERATURE	Up to 52°C (125°F)	
VIBRATION RESISTANCE	Pass 33 cps @ 0.02 in. (0.51mm) amplitude Total cycles 237,600	
THERMAL SHOCK RESISTANCE	Pass 20°F to 200°F (– 6.5°C to + 93°C)	
CORROSION RESISTANCE	Pass FTM 151A @ 96 hrs. 0.5% NaC1 96°F (35°C) Fog	
SPECIFIC GRAVITY	1.82	
HARDNESS	35-40	ASTM D-2583

Product Information

UNIT COVERAGE:	Small Unit - 187 cu.in. (3.06 liters) Large Unit - 816 cu.in. (13.37 liters)
APPLICATION TEMPERATURE	55°F (13°C) to 95°F (35°C)
UNIT WEIGHT:	Small Unit: Resin (NH) – 12.5 lbs. (5.6 kg), 0.76 gal (2.9 L) in a 1 gal can, Hardener (H) – 0.6 lbs., (0.3 kg), 0.3 L (9 oz) in an 8 oz plastic bottle Large Unit: Resin (NH) – 53.5 lbs. (24.3 kg), 3.2 gal (12 L) in a 5 gal bucket, Hardener (H) – 2.6 lbs. (1.2 kg), 40 oz (1.2 L) in a ½ gal can
UNIT SHIPPING WEIGHT	Small Unit: 5.9 kg (13 lbs), Large Unit: 56 lbs. (25.5 kg)
CURE TIME (approximate):	18 hrs. @ 85°F (30°C) 24 hrs. @ 65°F (18°C)
POT LIFE:	30-40 mins. @ 70°F (21°C)
SHELF LIFE:	18 MONTHS
CLEAN UP:	IMPAX IXT-59 Solvent or equal

Reference

For design considerations and application details please request Bulletin No. 692 or contact ITW Polymer Technologies' Engineering Services Department.

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

Chockfast®

ITW QUICKSET

High Strength, Rapid-Setting, Multi-purpose Epoxy

Technical Bulletin # 1033A

Bulletin Description

ITW QUICKSET is a two-component high strength, fast-setting, multi-purpose epoxy with a convenient mixing ratio of 1:1 by volume.

Use & Benefits

ITW QUICKSET can be used as a liquid shim, an anchoring adhesive or as a structural gap filler. It is recommended for applications requiring rapid turnaround of equipment but not for equipment requiring precise alignment (i.e. less than 0.005" or 0.127 mm movement over the life of the equipment).

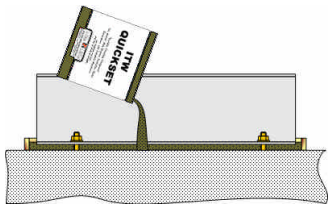
ITW QUICKSET can be quickly mixed and applied under concrete blocks, between steel plates or between concrete and steel. ITW QUICKSET was designed to fill a void within 15 minutes then harden to 78 shore D in 30 minutes and 84 Shore D in 4 hours at a concrete / steel temperature of 70° F (21° C). ITW QUICKSET will reach a minimum compressive strength of 14,500 psi (101.5 MPa) in about 6 hours at 70° F (21° C).

Design Considerations

Because ITW QUICKSET was designed to be installed within 15 minutes after mixing, the void area it fills must be of a size that can be completely filled within that time based on the application method chosen. ITW QUICKSET is a hot curing epoxy so the temperature of the epoxy, the temperature of the concrete or steel and the ambient temperature must be taken into consideration when installing it. A maximum thickness of 18mm (3/4 inch) recommended at 21° C (70° F) but ITW QUICKSET can be applied at ambient temperatures between 40° F and 85° F (5° C and 29° C). For applications outside either of these ranges contact the Engineering Services Department at ITW Polymer Technologies.

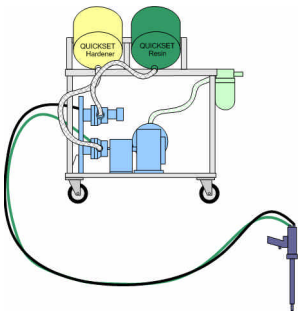
Application Instructions

ITW QUICKSET comes in 300 ml x 300 ml dual cartridge tubes, gallon cans, 5 gallon buckets or 55 gallon drums. It can be mixed and applied by either mixing it with a Jiffy Mixing blade for 3 minutes then pouring it in place or by using a manual or automated mixing and dispensing system.



The convenient 300ml x 300ml (21 fl.oz) side-by-side, dual component cartridges comes with a static mixing nozzle and requires an application gun to dispense it. Hand or air operated application guns are not available through ITW Polymer Technologies but can be obtained at large hardware and construction equipment suppliers.

An automated mixing and dispensing system is recommended when it is necessary to apply a large volume of the epoxy in a short period of time. An automated dispensing system consists of metering pumps, hoses and a manually operated dispensing gun with a static mixing nozzle.



Depending on the temperature of the concrete or steel, the thickness of the gap to be filled and the importance of a fast cure rate, ITW QUICKSET epoxy resin and hardener may need to be individually pre-mixed prior to dispensing. It should also be preconditioned for 24 hours while still in the drum to 65°F to 75°F (18°C to 24°C) prior to dispensing.

Please consult ITW Polymer Technologies for additional information.

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936
Phone 215-855-8450 • Fax 215-855-4688 • www.chockfast.com

Physical Properties

COMPRESSIVE STRENGTH:	14,500 psi (101.49 MPa)	ASTM D-695
COMPRESSIVE MODULUS OF ELASTICITY:	347,000 psi (2392.5 MPa)	ASTM D-695
LINEAR SHRINKAGE:	< 0.5%	ASTM D-2566
FLEXURAL STRENGTH:	15,400 psi (106.18 MPa)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY:	191,000 psi (1316.9 MPa)	ASTM D-580
TENSILE STRENGTH:	8,800 psi (60.67 MPa)	ASTM D-638
TENSILE MODULUS:	191,000 psi (1316.9 MPa)	ASTM D-638
TENSILE LAP SHEAR STRENGTH:	908 psi (6.26 MPa) after 30 min. >1,300 psi (9 MPa) after 7 days	ASTM D-1002
% ELONGATION AT BREAK:	5.9%	ASTM D-638
SPECIFIC GRAVITY OF RESIN:	1.17	
VISCOSITY OF RESIN:	48,800 cps @ 10 RPM using Viscosity Brookfield Viscometer Spindle #3	
SPECIFIC GRAVITY OF HARDENER:	1.66	
VISCOSITY OF HARDENER:	8,800 cps @ 20 RPM using Viscosity Brookfield Viscometer Spindle #3	
MIXED VISCOSITY:	27,000 cps @ 20 RPM using Viscosity Brookfield Viscometer Spindle #3	
GEL TIME @ 75° F (24°C):	15 min 100 gram mass	
SHORE D HARDNESS:	70 @ 30 Minutes @ 70oF 78 @ 1 Hour 82 @ 4 Hours 84 @ 1 Day	
FIRE RESISTANCE:	Self Extinguishing	ASTM D 635

Product Information

UNIT COVERAGE:	**Dual Tube Cartridge:** 37 $in.^3$ (600ml) **2 gal Unit**: 435 $in.^3$ (7.1 L) **10 gal Unit**: 2,282 $in.^3$ (37.4 L) **110 gal unit**: 21,131 $in.^3$ (346.3 L)
APPLICATION TEMPERATURE:	41°F (5°C) to 95°F (35°C)
PACKAGING per Unit:	**Dual Tube Cartridge:** Resin - 0.8lbs (0.36 kg), Hardener – 1.1 lbs (0.5 kg) **2 gal Unit**: Resin – 9.3 lbs. (4.2 kg), Hardener – 12.86 lbs. (5.8 kg) in two (2) 1 gal cans **10 gal Unit**: Resin – 48.5 lbs. (22 kg), Hardener – 68 lbs. (30.8 kg)) in two (2) 5 gal cans **110 gal unit**: Resin – 441 lbs. (200 kg), Hardener – 641 lbs. (291 kg) in two (2) 55 gal drums
CURE TIME (approximate):	6 hours @ 21° C (70° F)
POT LIFE:	15 min. @ 21° C (70° F)
SHELF LIFE:	2 years
CLEAN UP:	IXT-59 or similar epoxy solvent

Date 01/2009

EQUIPMENT FOUNDATION SYSTEMS

ITWPRC 100 NON-SHRINK

High Performance, Non-shrink Cement grout

Technical Bulletin # 625E

Product Description

ITWPRC 100 NON-SHRINK CEMENT GROUT is a high performance, non-shrink, precision grout that meets or exceeds all requirements of the Corps of Engineers CRD C-621 and ASTM C-1107. It is designed for a wide range of consistencies from damp pack to high fluidity, meeting the most demanding job conditions.

Use & Benefits

ITWPRC 100 NON-SHRINK CEMENT GROUT is recommended for grouting of anchor bolts, baseplates, structural steel and pre-cast columns, dowels, etc. which require non-shrink, high tolerance, high strength performance. It is flowable for easy placement, adheres well to concrete or steel, and exhibits good impact and vibration characteristics.

Design Considerations

Pre-washed graded 3/8" pea gravel may be used in applications thicker than 2". In depths from 2" to 5", add 25% of the 3/8" pea gravel by weight. For depths 5" and deeper, add 50% 3/8" pea gravel by wt. When grouting in hot weather, provide shade around the area to be grouted. Use cool mixing water and protect the grout from the sun for up to 48 hours.

When grouting in cold weather, raise the temperature of the area to be grouted. Preheat the mixing water and cover the grout to retain warmth. **DO NOT** place at temperatures below 40°F or if the temperature is expected to fall below 40°F within the next 24 hour period.

ITWPRC 100 NON-SHRINK CEMENT GROUT should be kept in a shaded, dry area. At no time should the packaged material be exposed to moisture.

Application Instructions

Remove all dirt, oil or loose foreign material from any steel surface to come in contact with CHOCKCRETE. Concrete surfaces must be sound and roughened to insure proper bonding. Concrete surfaces should be saturated for a minimum of 4 hours but preferably for 24 hours prior to placing the grout. Remove all excess water from the foundation prior to placing ITWPRC 100 NON-SHRINK CEMENT GROUT.

Build the forms at least 1" higher than the bottom of the item being grouted.

A portable mortar mixer should be used when mixing the grout. Start with the minimum water requirements. **ADD WATER TO MIXER FIRST**, then slowly add powder. Add additional water as required for desired consistency. Water requirements per 50 lb. bag are:

Plastic	Flowable	Fluid
6.80 to 7.00 pints water	7 to 8 pints water	8.00 to 9.25 pints water
0.85 to 0.88 gal.	0.88 to 0.94 gal	1.00 to 1.19 gal.
7.05 to 7.30 lbs.	7.30 to 7.80 lbs.	8.33 to 9.50 lbs.
3.18 to 3.29 liters	3.29 to 3.79 liters	3.79 to 4.40 liters

CAUTION: **DO NOT OVER WATER.** Adding more water than recommended can cause bleeding, separation and a reduction of ultimate strength. **DO NOT** re-temper or add additional cement, sand or admixtures without first contacting ITW Polymer Technologies.

The grout should be placed continuously by pouring from one side to the other to avoid air entrapment. Cover with clean wet rags and keep moist until final set.

ITW POLYMER TECHNOLOGIES
130 Commerce Drive • Montgomeryville, PA 18936 • 215-855-8450 • Fax 215-855-4688
www.chockfastgrout.com • www.escoweld.com

Physical Properties

COMPRESSIVE STRENGTH:	(psi)	**Plastic**	**Flowable**	**Fluid**	ASTM C-109
	3 days	5,900	5,400	4,800	
	7 days	8,900	7,700	6,200	
	28 days	11,500	8,400	7,700	
STATIC MODULUS OF ELASTICITY:	3 days 2.64 x 106 psi 7 days 2.79 x 106 psi 28 days 3.00 x 106 psi				ASTM C-469
		Plastic	**Flowable**	**Fluid**	
EXPANSION PERCENTAGE:	3 days	0.07%	0.03%	0.02%	CRD D-621
	14 days	0.07%	0.03%	0.02%	
	28 days	0.07%	0.03%	0.02%	
COEFFICIENT OF THERMAL EXPANSION:	4.76×10^{-6} in/in °F				ASTM C-531
FLEXURAL STRENGTH:	3 days 1,055 psi 7 days 1,230 psi 28 days 1,430 psi				ASTM C-78
SPLITTING TENSILE STRENGTH:	3 days 550 psi 7 days 680 psi 28 days 750 psi				ASTM D-496
STRENGTH OF ANCHORS:	Tensile Strength	Shear Strength			
1-1/4" dia. bolt in a 2-1/2" dia. hole with 9" embedment	53,200 lbs.	24,300 lbs.			ASTM E-488
1/2" dia. bolt in a 1-1/8" dia. hole with 4" embedment	7,100 lbs.	2,000 lbs.			

Product Information

UNIT PACKAGING:	Individual Bags - Super Sack			
UNIT WEIGHT:	22.7 kg (50 lbs.) Bags; 1,361 kg (3,000 lb) Super Sack			
UNIT YIELD:		**Plastic**	**Flowable**	**Fluid**
	Approx.	0.43 $ft.^3$	0.44 $ft.^3$	0.45 $ft.^3$
APPLICATION TEMPERATURE:	45°F Minimum - 90°F Maximum			
		Plastic	**Flowable**	**Fluid**	ASTM C-266
SET TIME (approximate):	Initial:	3.5 hrs	4 hrs	3.6 hrs	
	Final:	4.75 hrs	4.8 hrs	4.75 hrs	
SHELF LIFE:	1 year in dry, shaded storage				
CLEAN UP:	Water				

Date

06/2006

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Which Product is Right for Your Application?

Accessory Products

Product	Description
ITW PRC Expansion Joint Compound	2-component, epoxy resin formulation intended as a flexible foundation seam sealant. Self-leveling; flows smoothly; good adhesive strength and flexibility over a wide temperature range. Used to seal joints where expansion and contraction movement will take place. Remains flexible over a wide temperature range, 0°F to 150°F (-18°C to 65°C). Durable and weather resistant. Vibration and impact resistant
IMPAX Flexible Joint Sealant	2-component, polymer hybrid compound containing both urethane and epoxy resins that provides a tough, resilient filler for expansion joints; excellent flexural strength and elongation while maintaining impressive tensile strength; good adhesive strength and flexibility over a wide temperature range.
ITW PRC Repair Compound	2-component, 100% solids, epoxy paste developed specifically for filling, smoothing and fairing applications on metals, plastics (FRP), wood or masonry. Smooth consistency and excellent non-sagging properties. Excellent resistance to fresh water, salt water, crude and refined oils, gasoline, jet fuel. Provides a tough, uniform surface that will readily accept any top coating or lining. The cured epoxy is readily sanded or ground. The excellent feathering properties facilitate achieving a precision surface profile or smoothness. Contains no metallic fillers.
ITW PRC Concrete Adhesive	A specially formulated epoxy adhesive resin system designed for pressure injection repairs to concrete and adhesion of new concrete to old concrete.
ITW PRC Rust Inhibitive Primer 7CZ	2-component, lead and chromate free, rust inhibitive epoxy primer specifically designed for use in conjunction with ITW Polymer Technologies products applied to metal substrates. Recommended for use as a metal primer in severe industrial and chemical environments. Possesses excellent adhesion to properly prepared iron and steel surfaces, providing rust resistance to ferrous substrates, both on initial application and in the event of damage to the topcoat. Can be used under many epoxy, urethane, vinyl, chlorinated rubber and coal tar/epoxy finish coats.
Super Alloy Titanium Repair Compound	The latest in high technology, high bond strength repair systems. Use to join such dissimilar metals as iron, steel, aluminum, tungsten carbide, brass, zinc, and zinc alloys without the problems of galvanic corrosion. Adheres tenaciously to properly prepared surfaces. Hardens to a rigid metallic mass which permits drilling, tapping, or machining with ordinary metalworking tools. Maintains an integral bond, a high level of resistance to impact, abrasion, chemicals and high temperature.
Super Ceramic Repair Putty	Smooth, ceramic-filled epoxy putty with exceptional wear resistance. The "no-slump" nature makes it ideal for repairing overhead, vertical or curved surfaces. Well suited for the repair of severe service equipment commonly found in a variety of industrial and marine applications.
Super Ceramic Repair Liquid	A unique ceramic filled, high build, brush able epoxy coating. Formulated for unequaled chemical and corrosion resistance with outstanding wear properties in adverse environments. Ideally suited for lining and resurfacing all types of severe service equipment commonly found in a variety of industrial and marine applications.
Phillybond #6	2-component, high strength epoxy paste for the repair of punctures or cracks in tanks, pumps, pipes, steam lines, sea chests, valve bodies, and many other applications. The material is also used to fill holes, voids and to provide a smooth surface for repairs at temperatures up to 428°F (220°C). Resistant to most acids, alkali and hydrocarbons and will adhere to clean surfaces such as steel, cast iron, bronze, aluminum, copper, nickel, wood and most plastics.
Phillyclad #8	2-component, fast-setting epoxy laminating resin system designed for high strength fiberglass reinforced repairs to pipes, tanks, valves, and other equipment subject to corrosion or erosion. Used to repair leaks in areas at operating temperatures to 428°F (220°C). Excellent resistance to salt water, crude and refined oil, gasoline, caustics and most acids.
IMPAX IXT-59 Solvent	An aromatic hydrocarbon solvent used for general epoxy cleanup of tools and equipment used for mixing and applying epoxy materials. It must be used before the epoxy has set. Also used for removing grease, oil and other contaminants from surfaces prior to applying epoxy materials.
Release Agent	Release Agent prevents adhesion between most ITW Polymer Technologies' products and surfaces of metal, glass, rubber and many plastics. Used where the minimum possible clearance between resin and mating surface is required.

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EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Expansion Joint Compound

Technical Bulletin # 1018C

Product Description

ITW POLYMER TECHNOLOGIES EXPANSION JOINT COMPOUND is a two component epoxy resin formulation intended as a flexible foundation seam sealant. It is self-leveling, flows smoothly and has good adhesive strength and flexibility over a wide temperature range.

Use & Benefits

ITW POLYMER TECHNOLOGIES EXPANSION JOINT COMPOUND is used to seal joints where expansion and contraction movement will take place. For best results, design the joint to be twice as wide as is deep.

A few of the benefits include:

- Excellent adhesion to concrete, masonry, cured epoxy, glass, aluminum, steel, wood and many other construction materials.
- Remains flexible over a wide temperature range, 0°F to 150°F (-18°C to 65°C).
- Durable and weather resistant.
- Vibration and impact resistant.

Surface Preparations

Store the resin and hardener at between 70°F (21°C) and 80°F (27°C) for 24 hours before use. All surfaces must be sound, clean and dry. Remove all oils, grease, previous caulking, efflorescence and protective coating, etc. New concrete must be completely cured. Application should be made when the joint is as near mid-working temperature range as practicable, but above 55°F (13°C). Mix EXPANSION JOINT COMPOUND by adding the hardener to the resin can and using a small Jiffy mixer blade at 200 rpm in an electric drill. Mix for three minutes. Clean all tools with PRT-59 solvent. A trowelable mixture can be made by adding dry sand to mixed EXPANSION JOINT COMPOUND.

Physical Properties

ELONGATION	200%
SERVICE TEMPERATURE	0°F - 150°F (-18°C to 65°C)

Product Information

COLORS	Red or Gray
MIX RATIO	12 parts resin to 1 part hardener
COVERAGE	152 cu. in. (2.5 liters)
APPLICATION TEMPERATURE	Above 13°C (55°F)
CURE TIME (approximate)	24 hours at 75°F (24°C) 48 hours at 55°F (13°C)
POT LIFE	45 minutes
CLEAN UP	IMPAX IXT-59 Solvent
UNIT WEIGHT	Resin: 1 gallon can. Net weight 6 lbs. 8 oz. (2.95 kg) Hardener: 1 pint can. Net weight 8.5 oz. (241 g)

Date

10/2005

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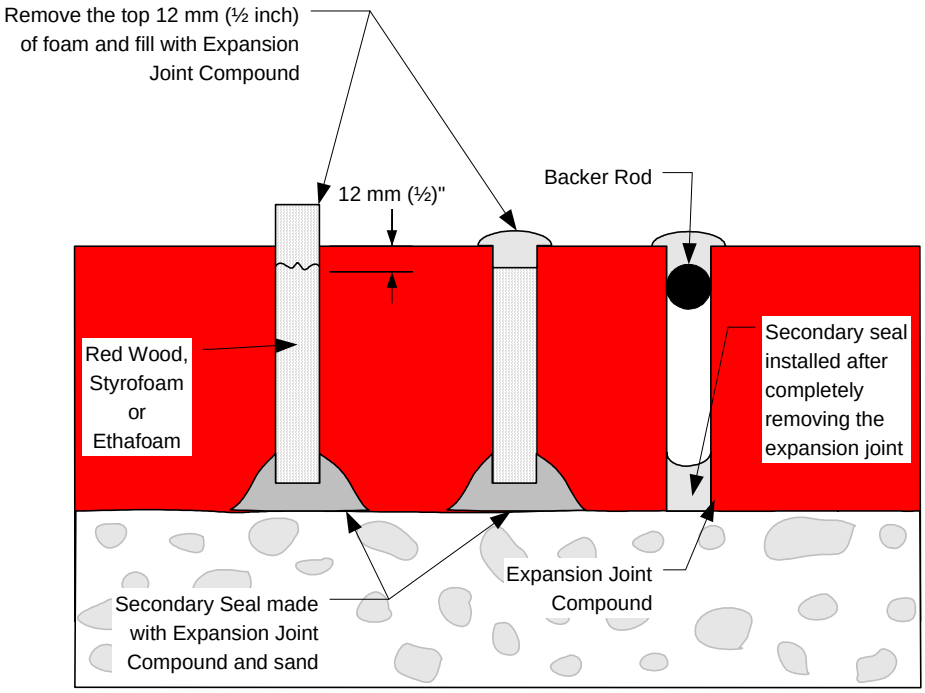

EQUIPMENT FOUNDATION SYSTEMS

Chockfast ESCOWELD

IMPAX Flexible Joint Sealant

Technical Bulletin # 1027A

Product Description

IMPAX Flexible Joint Sealant is a two-component, polymer hybrid compound containing both urethane and epoxy resins that provides a tough, resilient filler for expansion joints. This unique chemistry allows excellent flexural strength and elongation while maintaining impressive tensile strength. It also has good adhesive strength and flexibility over a wide temperature range.

Use & Benefits

IMPAX Flexible Joint Sealant is a filler and sealer for engineered control joints to prevent damage to the joint and its edges. It is also suitable for sealing cracks. Benefits include:

- 100% Solids, solvent-free product
- Excellent adhesive strength and flexibility
- Pourable grade, superior workability
- Easily mixed with drill and mixing blade
- High chemical resistance

Surface Preparations

All surfaces must be sound, clean and dry. Remove all oils, grease and other foreign or unwanted material, in and around the joint prior to application. Insert a backer rod into the joint to the desired depth of the joint sealant. The depth of the joint sealant is measured from the top of the backer rod to the top of the joint. To insure adequate joint elasticity, the depth of the sealant should not exceed twice the joint width. Tape off the joint up to the edge on either side.

Application Instructions

The application surfaces and joint sealant material must be at a sensible working temperature range during application (see back for application temperature information). Dual cartridge kits come with a static mixer. Larger quantities should be power mixed using equal parts of Component A and Component B until streak-free using a Jiffy Model HS or equal mixing blade. Dispense or pour mixture slowly into the joint allowing the material to settle. A second application may be necessary if material settles too much. Scrape excess sealant flush with top of joint using putty knife and remove tape.

Estimating Guide

Linear Feet Per Gallon of Sealant Required
Each Gallon Yields Approximately 231 cu. in.

Width of Joint

Depth of Joint Sealant	1/4”	3/8”	1/2”	5/8”	3/4”	7/8”	1”
1/4”	308	205	154	123	102	88	77
3/8”		136	102	82	68	58	51
1/2”			77	61	51	44	38
5/8”				49	41	35	30
3/4”					34	29	25
7/8”						25	22
1”							19

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Physical Properties

TENSILE ELONGATION	50% @ Breaking Point @ 72°F (22°C)
VISCOSITY	Part A - 350 to 550 Poise Part B - 200 to 350 Poise Mixed – 17,000 cps
FLASH POINT	200°F (93°C)
VOCs	0 lbs./gal. (0 gms./ltr.) - based on mixed components
SERVICE TEMPERATURE	-40°F to 200°F (-40°C to 93°C)

Product Information

COLOR	Gray
MIX RATIO	1:1 equal parts resin/hardener by volume
PACKAGING	600 ml Dual Cartridge Kit with Static Mixing Nozzle. Comes 12 Kits to the case. 1 gal. unit consists of 1/2 gallon can of resin and 1/2 gallon can of hardener (3.78 liters unit volume
COVERAGE (approximate)	600 ml Cartridge – 37 in^3 (0.16 gal) 1 Gal Unit - 231 in^3 (1,490 cc)
APPLICATION TEMPERATURE	55° minimum to 100°F maximum (13° C min to 38° C max) *Must be 5°F above dew point
CURE TIME (approximate)	Moderate Service -- 24 hrs. @ 72°F (22°C) @ 50% RH Full Cure -- 5 days @ 72°F (22°C) @ 50% RH
POT LIFE	45 mins. @ 72°F (22°C)
CLEAN UP	IMPAX IXT 59 Solvent
SHIPPING WEIGHT	1-gal. Unit – 16.5 Lbs. (7.48 Kg)
PACKAGING per Unit	Resin (NH) - 6 lbs. (2.7 kg), 0.72 gal (2.7 L) in a 1/2 gal can, Hardener (H) – 6 lbs. (2.7 kg), 0.72 gal (2.7 L) in a 1/2 gal can
SHELF LIFE	12 months in closed container stored @ 50°F to 90°F (10°C to 32°C)

Precautions

Provide ample ventilation in all areas of handling, mixing and use. Avoid prolonged breathing of possible fumes. Minimize skin contact. Use of goggles, rubber gloves and protective creams is recommended. Always wash exposed areas immediately using warm water and soap, followed by rinsing with clear water. Observe all safety precautions when using any type of solvent for skinning or cleaning tools and equipment.

Date

1/2009

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Repair Compound

A General Purpose Repair Epoxy

Technical Bulletin # 1015B

Product Description

ITW Polymer Technologies' REPAIR COMPOUND is a two component epoxy paste developed specifically for filling, smoothing and fairing applications on metals, plastics (FRP), wood or masonry. The smooth consistency and excellent non-sagging properties of REPAIR COMPOUND make it unexcelled for leveling rough or pitted plating, forming fillets, smoothing weld seams, etc. REPAIR COMPOUND Is nontoxic and contains no solvents. Resistance to fresh water, salt water, crude and refined oils, gasoline, jet fuel, etc., is excellent.

Use & Benefits

REPAIR COMPOUND is ideal for repairing and preparing surfaces of hulls, storage tanks, sonar domes, etc., for painting, fiberglass applications or rubber lining where all welds, pitting, rough surfaces or irregularities are required to be smoothed. The use of REPAIR COMPOUND provides a tough, uniform surface that will readily accept any top coating or lining.

Its exceptional troweling and application characteristics provide a smooth finished surface. If additional finishing is desirable, the cured epoxy is readily sanded or ground. The excellent feathering properties facilitate achieving a precision surface profile or smoothness.

Pump casings, impellers, sea chests, condenser boxes, etc., are easily and effectively repaired with REPAIR COMPOUND. Additional uses include the fairing of corroded or uneven hull and deck plating, repair of cavitation damage, repair and sealing of riveted seams, etc. REPAIR COMPOUND is ideally suited for fairing around sensitive electrical equipment, as it contains no metallic fillers.

Surface Preparations

The adhesion of REPAIR COMPOUND is greatly improved by removing all grease, rust, scale and paint from surface before application. Sand-blasting of metal surfaces to SSPC #10 Near White is the preferred preparation, but sanding, grinding or hand chipping are acceptable for small areas. Un-coated fiberglass or wood requires grinding or sanding to roughen and clean surface. Compound may be used for fairing over sound old coatings if surface is lightly abraded by sanding to maximize adhesion.

Remove all grease and oil films by thoroughly cleaning surface with clean rags saturated with TriChloroEthylene, Xylene or IMPAX IXT-59 Solvent.

Application Instructions

Place equal quantities by volume of blue resin and white hardener on small palette or mortarboard with putty knife. Thoroughly mix the equal quantities together until a uniform streak-free blue color is achieved. A complete inter-mixing of the two components is essential for proper curing.

Working time of mixed material is one hour at 72°F (22°C), longer at lower temperatures, shorter at higher temperatures.

REPAIR COMPOUND will hard cure and is readily over coated, ground or sanded in 6 hours at 70°F (21°C). Up to 8 hours may be required at 50°F (10°C). Hand or tool dampened with water aids in smoothing. Clean tools and equipment with epoxy solvent or IMPAX IXT-59 Solvent.

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Physical Properties

COMPRESSIVE STRENGTH	8,900 psi (623 kg/cm^2)	ASTM D-695
TENSILE STRENGTH	2,600 psi (183 kg/cm^2)	ASTM D-638
HARDNESS	65-70 Shore D after 8 hours @ 72°F (22°C) 80-85 Shore D after 24 hours @ 72°F (22°C)	ASTM 4-2240
IZOD IMPACT STRENGTH	5.3 in.lb./in (0.24 Newton meters/cm)	ASTM D-258
SERVICE TEMPERATURE		
SPECIFIC GRAVITY	1.45	

Product Information

COLOR	Resin – Blue Hardener – Cream Mixed - Blue
MIX RATIO	1 : 1 By Volume
UNIT COVERAGE	25 ft^2 (2.3 m^2)@ 1/8 in (3 mm) thick per 2 gallon kit
APPLICATION TEMPERATURE	Above 13^{o}C (55^{o}F)
CURE TIME (approximate)	Sandable: 3 hours @ 72°F (22°C) Hard Cure: 8 hours @ 72°F (22C°) Full Cure: 24 hours @ 72°F (22°C)
POT LIFE	70 min. @ 72°F (22°C)
CLEAN UP	IMPAX IXT-59 Epoxy Solvent
UNIT PACKAGING	Resin (NH): 3.2 L (0.84 gal) in a 1 gal can Hardener (NH): 3.6 L (0.94 gal) in a 1 gal can
UNIT WEIGHT	Resin: 4.6 kg (10.2 lbs) Hardener: 5.5 kg (12.2 lbs)
SHIPPING WEIGHT	11.3 kg (25 lbs)
SHELF LIFE	One year (closed container)

Date

10/2005

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Concrete Adhesive

Repairs Cracks & Improves Adhesion

Technical Bulletin # 1014A

Product Description

ITW Polymer Technologies CONCRETE ADHESIVE is a specially formulated epoxy adhesive system designed for pressure injection repairs to concrete and adhesion of new concrete to old concrete.

Use & Benefits

Use CONCRETE ADHESIVE to repair cracks in equipment foundations before grouting or to improve the bond between old concrete and new concrete.

Application Instructions

CONCRETE ADHESIVE is supplied in pre-measured, one gallon units. Mixing is accomplished by pouring the Hardener component into the slack filled Resin can and mixing until homogeneous. The use of a slow speed power mixer with an ITW Polymer Technologies' Jiffy mixer blade is recommended.

When using CONCRETE ADHESIVE between new and old concrete, pour new concrete within 3 hours of application of CONCRETE ADHESIVE while the adhesive is still wet to the touch.

Physical Properties

FLEXURAL STRENGTH	4,600 psi (323 kg/cm^2)	ASTM C-582
FLEXURAL MODULUS OF ELASTICITY	1.15 x 105 psi (80870 kg/cm2)	ASTM C-582
ELONGATION	56%	
TENSILE STRENGTH	4,050 psi (285 kg/cm2)	ASTM D-640
HARDNESS - BARCOL	62 @ 72°F (22°C) - 24 hours 78 @ 72°F (22°C)- 48 hours	
SERVICE TEMPERATURE		
SPECIFIC GRAVITY	1.07 gm/cm3)	
VISCOSITY	1,000 to 1,500 cps @ 72°F (22°C)	

Product Information

COVERAGE	230 in^3 (3769 cm^3)
APPLICATION TEMPERATURE	Above 13^{o}C (55^{o}F)
CURE TIME (approximate)	18 hours @ 72°F (22°C) 48 hours @ 72°F (22°C)
POT LIFE	40 Minutes @ 72°F (22°C)
CLEAN UP	IMPAX IXT-59 Solvent or equal
UNIT PACKAGING	Resin (NH): 2.1 L (0.56 gal) in a 1 gal can Hardener (NH): 1.7 L (0.45 gal) in a ½ gal can
UNIT WEIGHT	Resin: 2.5 kg (5.6 lbs) Hardener: 1.6 kg (3.6 lbs)
SHIPPING WEIGHT	4.8 kg (10.5 lbs)
SHELF LIFE	1 year

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Date 09/2005

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Warranty: ITW Polymer Technologies, a division of Illinois Tool Works Inc., warrants that its products meet their printed specifications. This is the sole warranty. This warranty expires one year after product shipment.

Warranty Claims: If any product fails to meet the above, ITW Polymer Technologies will, at its option, either replace the product or refund the purchase price. ITW Polymer Technologies will have no other liability for breach of warranty, negligence, or otherwise. All warranty claims must be made in writing within one year of the date of shipment. No other claims will be considered.

Disclaimer: ITW Polymer Technologies makes no other warranty, expressed or implied, and specifically disclaims any warranty of merchantability or fitness for a particular purpose.

Suggestions concerning the use of products are not warranties. The purchaser assumes the responsibility for determining suitability of products and appropriate use. ITW Polymer Technologies' sole liability, for breach of warranty, negligence or otherwise, shall be the replacement of product or refund of the purchase price, at ITW Polymer Technologies' election. Under no circumstances shall ITW Polymer Technologies be liable for any indirect, incidental or consequential damages.

Modification of Warranty: No distributor or sales representative has the authority to change the above provisions. No change in the above provisions will be valid unless in writing and signed by an officer or the Technical Director of ITW Polymer Technologies. No term of any purchase order shall serve to modify any provision of this document.

Mediation and Arbitration: If any dispute arises relating to products or product warranties, either the purchaser or ITW Polymer Technologies may a) initiate mediation under the then current Center for Public Resources (CPR) Model Procedure for Mediation of Business Disputes, or b) initiate a non-binding arbitration under the rules of the American Arbitration Association for the resolution of commercial disputes.

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

ITW RUST INHIBITIVE 7CZ PRIMER

Technical Bulletin # 1035

Product Description

ITW RUST INHIBITIVE 7CZ PRIMER is a lead and chromate free, rust inhibitive, two-component, epoxy primer specifically designed for use in conjunction with ITW Polymer Technologies coatings applied to metal substrates. It meets USDA standards for maintenance protective coatings not in direct contact with food in federally inspected meat and poultry plants.

Use & Benefits

ITW RUST INHIBITIVE 7CZ PRIMER is recommended for use as a metal primer in severe industrial and chemical environments. It possesses excellent adhesion to properly prepared iron and steel surfaces, providing rust resistance to ferrous substrates, both on initial application and in the event of damage to the topcoat. It can be used under many epoxy, urethane, vinyl, chlorinated rubber and coal tar/epoxy finish coats.

Surface Preparation

Steel: 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.

Previously Painted Surfaces: If the paint is peeling or degrading in any way, it should be completely removed by sanding, blasting or stripping. If previous paint coating is completely intact, the surface may be cleaned with a strong detergent or solvent and scuff sanded to remove the gloss. A spot test should be made by applying a small amount of coating over old paint. The old finish may wrinkle or lift within 60 minutes. If it does not, wait 5 days and test for adhesion. Do this by cutting an "X" into the coating, place tape firmly over the cut, then strip with a hard, fast pull. If the old finish fails, it must be removed.

Application Instructions

1. Application should only take place when surface and ambient temperature is 40°F (4.4°C) or above and the material temperature is no lower than 50°F. Application not recommended with surface temperatures over 140°F. Surface to be painted must be at least 5°F(3°C) above the dew point.
2. ITW RUST INHIBITIVE 7CZ PRIMER should be applied to a minimum 2-3 mils (50-75 microns) dry film thickness above the averaged surface profile.
3. ITW RUST INHIBITIVE 7CZ PRIMER can be applied by spray, roller or brush. Spraying should be done perpendicular to the surface to insure complete coverage. Each pass of the spray gun should overlap the previous pass by 50%. Weld seams and edges should be stripe coated prior to complete prime coat.
4. ITW RUST INHIBITIVE 7CZ PRIMER is a two-part compound. Mechanically mix the base portion until homogenous. Pour the hardener into the container of base material and mechanically stir thoroughly until uniform (approximately three minutes). NO THINNERS MAY BE ADDED. Make sure that all sediment is stirred up off the bottom of the can.
5. ITW RUST INHIBITIVE 7CZ PRIMER does not require the usual induction period and may be applied immediately after mixing. Working pot life is 4 hours at 70°F.
6. The primed surface should be protected from contamination. Block off area to prevent any foot or rolling traffic.

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7. If the non-skid application is delayed so that the surface becomes contaminated, clean the area again. Tack coat is not normally required provided the non-skid application is made within 7 days at 70°F (21°C). After 7 days, the primed surface must be mechanically abraided or brush blasted prior to application of a tack coat.
8. Clean tools and spray equipment immediately after completing installation using an epoxy solvent compliant with state and federal V.O.C. regulations.

Physical Properties

COLOR:	Gray
VOLUME SOLIDS (%):	71%
V.O.C:	2.0 lbs. per gal. (250 grams/liter)
POT LIFE:	4 hours @ 70ºF (21ºC)
DRY TIME:	Tack Free - 1 3/4 hour @ 70ºF (21ºC) Recoat - 12 hours @ 70ºF (21ºC)
COVERAGE:	270 sq. ft./gal. (4 milsDFT/6.5 mils WFT)
APPLICATION TEMPERATURE:	55°F minimum to 95°F maximum (13°C minimum to 35°F maximum) * 5°F (3°C) above dew point
SHELF LIFE:	12 months
RELATIVE HUMIDITY:	85% maximum
REDUCER:	None
CLEAN UP:	IMPAX IXT-59 Solvent
WEIGHT PER GALLON:	12.7 lbs. per gal. (1.52 kg./liter)
UNIT PACKAGING:	Resin (NH): 2.9 L (0.77 gal) in a 1 gal can Hardener (NH): 0.87 L (0.23 gal) in a quart can
UNIT WEIGHT:	Resin: 4.9 kg (10.8 lbs) Hardener: 0.86 kg (1.9 lbs)

Date

10/2007

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Super Alloy Titanium Repair Compound

Technical Bulletin # 820K

Product Description

SUPER ALLOY Titanium Repair Compound is the latest in high technology, high bond strength repair systems. The SUPER ALLOY system was conceived through a program utilizing "state-of-the-art" computer science and systematic evaluations. Long, intensive studies resulted in SUPER ALLOY'S specific formulation providing industry with a fast, permanent repair to equipment that might otherwise require costly "downtime." The SUPER ALLOY system is the ideal solution to joining such dissimilar metals as iron, steel, aluminum, tungsten carbide, brass, zinc, and zinc alloys without the problems of galvanic corrosion.

Use & Benefits

- SUPER ALLOY adheres tenaciously to properly prepared surfaces.
- SUPER ALLOY's advanced capabilities allow expedient repairs of castings, blocks, foundations, shafts and other equipment without the use of heat, pressure or special tools. The material hardens to a rigid metallic mass which permits drilling, tapping, or machining with ordinary metalworking tools.
- Super ALLOY creates an integral bond, maintaining a high level of resistance to impact, abrasion, chemicals and high temperature.

Surface Preparations

Roughen" an area slightly larger than the damaged area by abrasive blasting. An 8-40 mesh grit size is best. When conditions do not allow abrasive blasting, a grinding wheel may be used. Wash the abraded surface with Impax IXT-59 or similar solvent to remove all dust, grit and grease. Be careful not to touch the area with bare hands once the area is solvent washed. NOTE: SUPER ALLOY should be applied to the repair area immediately upon completion of surface preparation to prevent oxidation of un-coated metal.

Application Instructions

Place three parts resin and one part hardener by volume on a clean SUPER ALLOY mat and mix thoroughly. Mix only as long as is necessary to obtain a uniform, streak-free color. NOTE: Mix only as much as can be used in 15-20 minutes.

We advise repairing only non-stress cracks that resulted from impact due to foreign objects or freezing. DO NOT use SUPER ALLOY to repair cracks caused by metal fatigue. Terminate the crack by drilling holes at each end. Diameter of the holes should be 4.8mm (3/16") plus the width of the crack. If the crack exceeds 150mm (6") in length, holes should be drilled every 75mm (3"). Force SUPER ALLOY into the crack and then apply more metallic paste over the entire prepared surface at a nominal thickness 6mm (1/4").

Small holes or severely pitted metal may be repaired by filling the affected area and then fairing out over the edges. To repair large holes, first apply a temporary backing plate (an extra SUPER ALLOY mat works well) to the inside of the damaged area. Fill the void with SUPER ALLOY until the material is slightly above the finished surface. Allow to cure for two hours. Apply final layer of SUPER ALLOY to the entire area at a nominal thickness of 6mm (1/4") to 9.5mm (3/8"). Allow repair area to cure for 18 hours at 22°C (72°F).

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Physical Properties

COMPRESSIVE STRENGTH	1,070 kp/cm2 (15,200 psi)	ASTM C-695
LINEAR SHRINKAGE	0.001 in/in. (0.001 mm/mm)	ASTM D-2566
COEFFICIENT OF LINEAR THERMAL EXPANSION	40.1 x 10^{-6} /C° (22.3 x 10^{-6} /F°)	ASTM D-698
FLEXURAL STRENGTH	542 kp/cm2 (7,700 psi)	ASTM C-790
ADHESIVE TENSILE SHEAR STRENGTH	140 kp/cm2 (2,000 psi)	ASTM D-1002
HARDNESS	Shore D = 87	ASTM D-1076
ABRASION RESISTANCE	20 mg/1000 cycles Average 5000 cycles	Federal Test standard 406 method 1091
SERVICE TEMPERATURE	Up to 250°F (121°C)	

Product Information

COLOR	Resin > Silver / Hardener > Gray = Gray after mixing
COVERAGE	190 cc (12 cu.in.)
MIX RATIO	3-1 resin to hard. by vol; 4.3-1 resin to hard. by wt.
APPLICATION TEMPERATURE	13°C (55°F) to 35°C (95°F)
CURE TIME (approximate)	18 hours @ 22°C (72°F)
POT LIFE	25 minutes @ 22°C (72°F)
CLEAN UP	IMPAX IXT-59 Epoxy Solvent or equivalent
UNIT PACKAGING	Resin (NH): 151 cc (5 oz) in a 12 oz plastic jar Hardener (NH): 38 cc (1.3 oz) in a 4 oz plastic jar
UNIT WEIGHT	Resin: 372 g (0.82 lbs) Hardener: 86 kg (0.09 lbs)
SHIPPING WEIGHT	816 g (1.8 lbs)
SHELF LIFE	2 years

Physical properties can be improved by heating the repair area "after" hardening at room temperature. Recommended method is to apply heat for two hours at 65°C (150°F).

Reference

For detailed information on shaft repairs, refer to SUPER PRODUCTS Repair Procedure #832. For detailed information on other repairs, contact ITW Polymer Technologies.

Date

09/2005

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Super Ceramic Repair Putty

Technical Bulletin # 821G

Product Description

SUPER CERAMIC Repair Putty is a smooth ceramic-filled epoxy putty with exceptional wear resistance. The "no-slump" nature of SUPER CERAMIC Repair Putty makes it ideal for repairing overhead, vertical or curved surfaces.

Use & Benefits

SUPER CERAMIC Repair Putty is well suited for the repair of "severe service" pump equipment commonly found in industries, such as pulp and paper mills, chemical processing, refineries, marine and coal mining operations as well as many others.

Surface Preparations

The repair area should be free of all grease, dirt and oxidation. The surface should be sandblasted to "near white" metal using an 8 to 40 mesh grit. Grinding is suitable for small areas or when other methods are prohibited. The entire area should then be washed down with IMPAX IXT-59 Safety Solvent.

NOTE: Be careful not to touch the repair area with bare hands after solvent washing. SUPER CERAMIC Repair Putty should be applied as soon as possible after blasting to prevent oxidation.

Application Instructions

SUPER CERAMIC Repair Putty's consistency was designed to provide a stiff mix to insure its "no-slump" capabilities when applied to overhead, vertical or curved surfaces.

Place 7 parts resin and 1 part hardener by weight or 4.3 parts resin and 1 part hardener by volume on a clean, flat surface and mix thoroughly with a trowel or wide blade tool. Material should have a streak-free gray color.

NOTE: Do not mix more than 4 minutes or "no-slump" properties may diminish. Do NOT power mix.

When repairing a pump casing, the entire housing should have approximately 3mm (1/8") of SUPER CERAMIC Repair Putty applied to it. Be sure to allow adequate clearance between housing and impeller. If it is not possible to coat the entire housing, do not feather edge the SUPER CERAMIC. Instead, square off the repair area to leave at least a 3mm (1/8") application of SUPER CERAMIC Repair Putty at the edge of the damaged area.

NOTE: Do not mix more material than can be applied in 20 minutes.

Top coating SUPER CERAMIC Repair Putty with additional layers must be accomplished prior to the first layer taking a hard set -- 4 hrs. @ 22°C (72°F). Once SUPER CERAMIC Repair Putty hardens, the surface must be brush blasted or abraded to insure inter-layer bonding of subsequent layers.

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Physical Properties

COMPRESSIVE STRENGTH	877.5 kp/cm^2 (12,700 psi)	ASTM D-695
COEFFICIENT OF LINEAR THERMAL EXPANSION	44.6 X 10^{-6}/°C 24.8 X 10^{-6}/°F	ASTM D-698
TENSILE SHEAR STRENGTH	125.4 kp/cm2 (1,800 psi)	ASTM D-1002
HARDNESS	Shore D = 90	ASTM D-1706
IZOD IMPACT STRENGTH	0.28 foot pounds/inch notch	ASTM D-256
SERVICE TEMPERATURE	-73°C to 260°C (-100°F to 500°F)	

Product Information

COLOR	Resin – Gray, Hardener – White Gray after mixing
MIX RATIO	7 to 1 by weight 4.3 to 1 by volume
COVERAGE	280 cc (17 cu.in.)
APPLICATION TEMPERATURE	13°C (55°F) to 35°C (95°F)
CURE TIME (approximate)	24 hours @ 22°C (72°F)
POT LIFE	20 minutes @ 22°C (72°F)
CLEAN UP	IMPAX IXT-59 Solvent or similar
APPLICATION TEMPERATURE	13°C (55°F) to 35°C (95°F)
UNIT PACKAGING	Resin (NH): 227 cc (7.7 oz) in a 12 oz plastic jar Hardener (NH): 53 cc (1.8 oz) in a 4 oz plastic jar
UNIT WEIGHT (1 lb kit)	Resin: 405 g (0.89 lbs) Hardener: 60 g (0.13 lbs)

Reference

For detailed information on the repair of eroded Kort nozzles, refer to SUPER PRODUCTS Repair Procedure #831. For detailed information on other repairs, contact ITW Polymer Technologies.

Date

10/2005

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Super Ceramic Repair Liquid

Technical Bulletin # 819F

Product Description

SUPER CERAMIC Repair Liquid is a unique ceramic filled, high build, brush able epoxy coating. Formulated for unequaled chemical and corrosion resistance with outstanding wear properties under adverse environments.

Use & Benefits

SUPER CERAMIC Repair Liquid is ideally suited for lining and resurfacing all types of severe service equipment commonly found in chemical plants, power plants, pulp & paper mills, mining operations, water treatment plants and a variety of other industrial and marine applications.

Surface Preparation

The repair area should be free of all grease, dirt and oxidation. The surface should be sandblasted to "near white" metal using an 8 to 40 mesh grit size. Grinding is suitable for small areas or when other methods are prohibited. The entire area should then be washed down with IMPAX IXT-59 Safety Solvent.

NOTE: Be careful not to touch the repair area with bare hands after solvent washing. Unit should be repaired as soon as possible after blasting to prevent oxidation.

Application Instructions

Place 5 parts resin (by volume) and 1 part hardener in a clean, smooth sided container and mix thoroughly. Material should have a streak-free dark orange color. Do not mix more than five minutes.

DO NOT mix more material than can be applied in 15 minutes.

SUPER CERAMIC Repair Liquid may then be applied with a stiff, short bristle brush or plastic squeegee. Apply a thin coat, wetting out the application surface to fill all pitted areas and sealing the metal surfaces against corrosion.

When lining new equipment, the entire interior housing should have approximately 1.5 mm (1/16") of ceramic liquid. Be certain to maintain proper clearances between housing and impeller. This preventative maintenance procedure will greatly extend the longevity of severe service equipment as well as reducing costs due to downtime.

NOTE: When applying more than one coat add the black tube of additive to the second coat to obtain a dark brown color. This will help differentiate between the coats. Top coating SUPER CERAMIC Repair Liquid with additional layers must be accomplished prior to the first layer taking a hard set - 2 hrs. @ 22°C (72°F). Once SUPER CERAMIC Repair Liquid hardens, the surface must be brush blasted or abraded to insure inter-layer bonding.

SUPER CERAMIC Repair Liquid was specifically designed for use with SUPER CERAMIC Repair Putty for restoring original equipment dimensions to severely damaged units. Refer to Bulletin #821.

Physical Properties

COMPRESSIVE STRENGTH	1190.0 kg/cm^2 (16,900 psi)	ASTM D-695
FLEXURAL STRENGTH	563.4 kg/cm2 (8000 psi)	ASTM D790
ADHESIVE TENSILE SHEAR STRENGTH	220.0 kg/cm^2 (3125 psi)	ASTM D1002
HARDNESS	Shore D = 90	
SERVICE TEMPERATURE	-73°C (-100°F) to 260°C (500°F)	

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Product Information

COLOR	Resin > Orange / Hardener > Black = Dark Orange after mixing Additive > Black = Dark Brown after mixing
COVERAGE	300 cm^3 (18 cubic inches.)
MIX RATIO	10 to 1 by weight 5 to 1 by volume
APPLICATION TEMPERATURE	13°C (55°F) to 35°C (95°F)
UNIT PACKAGING	Resin (NH): 265 cc (9 oz) in a 12 oz plastic jar Hardener (H): 38 cc (1.3 oz) in a 4 oz plastic jar
UNIT WEIGHT	Resin: 408 g (0.9 lbs) Hardener: 41 g (0.1 lbs)
SHIPPING WEIGHT	0.8 kg (1.8 lbs)
CHEMICAL RESISTANCE	Excellent against acids, bleach, and petroleum products.
CURE TIME (approximate)	24 hrs. @ 22°C (72°F)
POT LIFE	15 minutes @ 22°C (72°F)
CLEAN UP	IMPAX IXT-59 Epoxy Solvent or equal
SHELF LIFE	

Date

09/2005

INDUSTRIAL PRODUCTS

PHILLYBOND #6

Technical Bulletin # 470

Epoxy repair and patching compound

Product Description

PHILLYBOND #6 is a two-component, high strength epoxy paste for the repair of punctures or cracks in tanks, pumps, pipes, steam lines, sea chests, valve bodies, etc. The material is also used to fill holes, voids and to provide a smooth surface for repairs [at temperatures up to 428°F (220°C)], PHILLYBOND #6 is resistant to most acids, alkali and hydrocarbons and will adhere to clean surfaces such as steel, cast iron, bronze, aluminum, copper, nickel, wood and most plastics.

Surface Preparation

Repair surfaces must be clean and sound and free of oil, dirt, old paint and other foreign matter. Blast, abrade or clean surface with emery cloth to rough bright finish for best adhesion. Final rinse of surface with Impax IXT 59 solvent helps to ensure complete removal of grease and oils.

Mixing and Application Instructions

Mix white resin with black hardener - four parts resin to one part hardener by weight or volume - with putty knife or similar tool until a streak-free uniform color is achieved. As PHILLYBOND #6 is a fast curing system, mix only that amount that can be used in 10-15 minutes. Apply the mixed compound to the repair area forming a cross section of at least 3/8" (9.5mm) thick. The patch should extend at least 2" (5cm) on all sides of the damaged area. PHILLYBOND #6 may be smoothed by wetting putty knife with IXT 59 solvent or water. After hardening PHILLYBOND #6 can be machined or sanded, as desired, for a smoother surface.

Technical Information

COLOR:	Gray (resin – white; hardener – black)
CURE TIME:	1 hr @72 °F (22 °C) @ ½ “ (12.7mm) thickness
MIXING RATIO:	4:1 by volume and weight
PACKAGING:	1 lb (454 grams) kit, 10 kits per case
	1 gallon (3.785 liter)kit
POT LIFE:	10 -15 minutes @72 °F (22 °C)
SHELF LIFE:	Two years/ Store in a cool dry area
TEMPERATURE RESISTANCE:	428 °F (220 °C)
SHEAR STRENGTH:	1000 psi (70.3 cm^2/kg)
VISCOSITY:	Paste putty
MIL SPEC:	R-17882-C

Date

07/2006

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INDUSTRIAL PRODUCTS

ITW Polymer Technologies

PHILLYCLAD® #8

Fast Set, Laminating Epoxy

Technical Bulletin # 966C

Product Description

PHILLYCLAD #8 is a two component fast setting epoxy laminating resin system designed for high strength fiberglass reinforced repairs to pipes, tanks, valves, and other equipment subject to corrosion or erosion.

Uses & Benefits

PHILLYCLAD #8 is also used to repair leaks in cargo heating coils, turbine drains, deck steam lines and other similar areas at operating temperatures to 220°C (428°F).

PHILLYCLAD #8 has excellent resistance to salt water, crude and refined oil, gasoline, caustics and most acids. When used with four layers of fiberglass tape PHILLYCLAD #8 has the capability to withstand in excess of 70 kg/cm$_2$ (1000 psi) hydrostatic pressure after one hour cure.

Surface Preparations

Repair effectiveness is dependent upon cleanliness of the surface of the repair area. Maximum adhesion is assured by removal of all grease, oil, paint and foreign matter. Surface must be cleaned to rough, bright metal finish by blasting, grinding or with emery cloth. Rinse surface with PRT-59 solvent to ensure a clean area.

Application Instructions

Do not mix hardener with resin until preparations are completed as working time of catalyzed material is approximately 15 minutes at 22°C (72°F). Mix PHILLYCLAD #8 by adding hardener to resin and stirring vigorously until a streak-free uniform color is achieved.

For repair of leaks, brush PHILLYCLAD #8 over an area extending 7.5cm (3") on each side of the repair area. Apply 3.75 or 7.5cm (1-1/2" or 3") fiberglass tape in a spiral wind, overlapping one-half of previous turn. Cover the coated area. Brush additional coat of PHILLYCLAD #8 and repeat for 4 wraps.

PHILLYCLAD #8 may also be used as a coating without fiberglass reinforcement and may be machined after it is fully cured using water as a coolant.

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Physical Properties

TEMPERATURE RESISTANCE:	Up to 220°C (428°F)
VISCOSITY:	Liquid, Brushable, Pourable
MIL SPEC:	R-17882-C

Product Information

COLOR:	Resin - White Hardener - Black Mixed - Gray
MIX RATIO:	4:1 Resin to hardener by volume or weight
PACKAGING per Kit:	500 grams (1.1 lb.) Kit, 16 Kits per case
CURE TIME (approximate):	Glass reinforced patches 3.0 to 6.5mm (1/8" to 1/4") thick approximately 1 hour @ 22°C (72°F). Thinner coats and lower temperatures require longer.
POT LIFE:	10-15 min. @ 22°C (72°F)
SHELF LIFE:	2 years
CLEAN UP:	PRT-59 or similar epoxy solvent

Date

09/2008

EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

IMPAX IXT-59 Solvent

For General Epoxy Cleanup

Technical Bulletin # 859C

Product Description

IMPAX IXT-59 is an aromatic hydrocarbon solvent used for general epoxy cleanup of tools and equipment used for mixing and applying epoxy materials. It must be used before the epoxy has set. Formerly known as PRT-59, IXT-59 is also used for removing grease, oil and other contaminants from surfaces prior to applying epoxy materials.

Application Instructions

WARNING: IXT-59 Solvent causes skin irritation on prolonged contact and may cause eye irritation. Wash hands with soap and water immediately after cleaning up with IXT-59.

CAUTION: IXT-59 is FLAMMABLE.

Physical Properties

DENSITY	7.66 lb./gal. - (0.9 gr/cc)	ASTM C-581
FLASH POINT	89°F (31.7°C) Tag Closed Cup	ASTM C-582
POUR POINT	-139°F (-95°C)	ASTM D-2568

Product Information

PACKAGING / WEIGHT per Unit:	1 gallon – 8 lbs. (3.6 kg)
	5 Gallon – 40 lbs. (18 kg)
SHELF LIFE:	12 months in closed container

Date

09/2005

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EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Release Agent

Technical Bulletin # 814C

Product Description

ITW POLYMER TECHNOLOGIES RELEASE AGENT prevents adhesion between most ITW Polymer Technologies' products and surfaces of metal, glass, rubber and many plastics. It is used where the minimum possible clearance between resin and mating surface is required.

Use & Benefits

RELEASE AGENT does not contain silicone oils. When properly used the release agent coating is only a few molecules thick and there is minimal, usually zero, transfer to the cast resin.

Application Instructions

The aerosol spray should be held 9" to 12" from the surface and a maximum of 1 second of spray on any given area will be ample. The surface should not appear wet even when freshly sprayed.

Do not substitute other release agents for ITW POLYMER TECHNOLOGIES RELEASE AGENT without testing their effect on adhesion, clearance and surface bubbling.

Date

10/2006

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Reference Technical Bulletins

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EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST Red vs. Concrete

A Comparison of Physical Properties

Technical Bulletin # 559A

Bulletin Description

In many operating environments, downtime is by far the most expensive cost component facing maintenance and rotating machinery engineers. Often there are only a few days available for a major foundation repair. After removal of cracked or contaminated concrete, Chockfast Red's deep pour capability is the fastest way to reconstruct critical concrete structures.

The overwhelming benefit of CHOCKFAST Red over concrete is its ability to rapidly rebuild and repair concrete structures saving time and money. As show by the data shows below, Chockfast Red will fully cure in 18 to 36 hours saving over twenty days in comparison to traditional concrete reconstruction techniques. In addition, the repaired structure will have greater mechanical strength and will resist corrosive materials to a far greater degree than the original structure.

Physical Properties

	CHOCKFAST Red	Concrete
COMPRESSIVE STRENGTH:	15,250 psi (1,072 kg/cm^2)	3,500 psi (246 kg/cm^2)
COMPRESSIVE MODULUS OF ELASTICITY:	2,000,000 psi (140,600 kg/cm^2)	6,000,000 psi (421,800 kg/cm^2)
LINEAR SHRINKAGE:	Not Measurable	0.2%
COEFFICIENT OF LINEAR THERMAL EXPANSION:	11.2 x 10^{-6}/F^o (20.1 x 10^{-6}/C^o)	5.9 x 10^{-6}/F^o (10.6 x 10^{-6}/C^o)
FLEXURAL STRENGTH:	4,025 psi (283 kg/cm^2)	800 psi (56.2 kg/cm^2)
FLEXURAL MODULUS OF ELASTICITY:	2,000,000 psi (140,600 kg/cm^2)	
TENSILE STRENGTH:	1,890 psi (133 kg/cm^2)	350 psi (25 kg/cm^2)
IZOD IMPACT STRENGTH:	4.6 in.lbs/in. (0.02 N.m/mm)	
ABRASION RESISTANCE:	5 Times Concrete	---
FIRE RESISTANCE:	Self Extinguishing	Not combustible
SPECIFIC GRAVITY:	2.06	2.4
CURE TIME:	18 to 36 Hours	28 Days
SHELF LIFE	2 years	

Reference

For design considerations and application details please request Bulletin No. 642 or contact ITW Polymer Technologies' Engineering Services Department.

Date

10/2006

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EQUIPMENT FOUNDATION SYSTEMS

Comparison of Physical Characteristics

For Various Grouting Compounds

Technical Bulletin # 610M

Bulletin Description

This bulletin compares the key physical properties and associated product information of the three major 3-component grouts comparing them to concrete.

Physical Properties

GROUT	CHOCKFAST RED	CHOCKFAST RED SG	ESCOWELD 7505E/7530	CONCRETE
TECHNICAL BULLETIN	617	618	1612	
COMPRESSIVE STRENGTH ASTM C-581 (MOD)	**15,250 psi (105 MPa)**	**18,120 psi (124.9 MPa)**	**14,000 psi (96.5 MPa)**	**3,500 psi (246 kg/cm2)**
COMPRESSIVE MODULUS OF ELASTICITY ASTM C-582	**2,000,000 psi (13793 MPa)**	**1,970,000 psi (13582 MPa)**	**1,800,000 psi (12411 MPa)**	**6,000,000 psi (41364 MPa)**
LINEAR SHRINKAGE ASTM D-2568	**Not Measurable**	**Not Measurable**	**0.036% (0.00036 in/in)**	**0.2%**
COEFFICIENT OF LINEAR THERMAL EXPANSION 0°C-60°C (32°F-140°F) ASTM D-698	**11.2 X 10^{-6} in/in/ °F (20.1 X 10^{-6} cm/cm/ °C)**	**10.8 X 10^{-6} in/in/ °F (19.4 X 10^{-6} cm/cm/ °C)**	**14.5 x 10^{-6} in/in/°F (25.2 X 10^{-6} cm/cm/ °C)**	**5.9 x 10^{-6} in/in/°F (10.6 x 10^{-6} cm/cm/ °C)**
FLEXURAL STRENGTH ASTM C-582	**4,025 psi (27.7 MPa)**	**4,800 psi (33 MPa)**	**4,700 psi (32.4 MPa)**	**800 psi (5.5 MPa)**
FLEXURAL MODULUS OF ELASTICITY ASTM C-582	**2 X 10^{6} psi (13793 MPa)**	**2.62 X 10^{6} psi (18060 Mpa)**	**1.8 x I0^{6} psi (1.26 x 105 kg/cm^{2}) (ASTM C-579)**	
TENSILE STRENGTH ASTM D-640	**1,832 psi (12.6 MPa)**	**2,130 psi (14.6 MPa)**	**2,100 psi (14.5 MPa)**	**350 psi (2.45 MPa)**
IZOD IMPACT STRENGTH ASTM D-258	**4.6 in.lb/in (0.02 N.m/mm)**	-	-	-
FIRE RESISTANCE ASTM D-637	**Self Extinguishing**	**Self Extinguishing**	**Self Extinguishing**	**Not combustible but spalls**
SPECIFIC GRAVITY	**2.06**	**2.24**	**2.00**	**2.4**

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Product Information

	CHOCKFAST RED	CHOCKFAST RED SG	ESCOWELD 7505E/7530
COVERAGE per UNIT	1.6 ft^3 (45.3L)	1.6 ft^3 (45.3L)	2.4 ft^3 (68L)
MAXIMUM POUR DEPTH	18 in (450 mm)	4 in (100 mm)	18 in (450 mm)
CURE TIME (approximate)	54 hrs. @ 60°F (16°C) 36 hrs. @ 72°F (21°C) 24 hrs. @ 80°F (27°C) 18 hrs. @ 90°F (32°C)	24 to 48 hours @ 70° F (21° C)	48 hrs. @ 60°F (16°C) 36 hrs. @ 72°F (21°C) 24 hrs. @ 80°F (27°C) 12 hrs. @ 90°F (32°C)
POT LIFE	3 hours	1 hour	2 hours
CLEAN UP	Water	Water	Water
PACKAGING per Unit	Resin: 1.6 gal. (6.1 L) Hardener: 0.9 gal. (3.4 L) 4 Bags Aggregate 46 lb. (21 kg)	Resin: 2.4 gal (9.05 L) Hardener: 0.43 gal (1.63 L) 4 Bags Aggregate 46 lb. (21 kg)	Resin: 2.57 gal (9.7 L) Hardener: 1.12 gal (4.2 L) 5 Bags Aggregate 53 lb (24 kg)
UNIT WEIGHT	207 lbs. (94 kg)	207 lbs. (94 kg)	305 lbs. (138 kg)
SHELF LIFE	2 years dry storage	2 years dry storage	2 years dry storage

NOTE: The physical properties quoted above are for laboratory prepared specimens. Tests on specimens from a job site may not be identical

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

Grouting Large Anchor Bolts

Technical Bulletin # 615C

Bulletin Description

This bulletin promotes the use of CHOCKFAST® Red or ESCOWELD 7505E/7530 as a grout for setting large anchor bolts in large, deep anchor bolt pockets. Typical 2-part epoxy chocking compounds (like CHOCKFAST Gray), while good for use in smaller holes, should not be used in such cases because the exothermic heat created by their large mass may crack the epoxy.

Deep anchor bolt pockets - up to 2 meters (6 ft) long and 200mm (8") wide - may be filled conveniently with a single placement of CHOCKFAST® Red or ESCOWELD 7505E/7530.

The gentle exotherm of CHOCKFAST®Red and ESCOWELD 7505E/7530 allows grout placement around large bolts to be executed with a single pour in extremely hot and humid climates with negligible shrinkage.

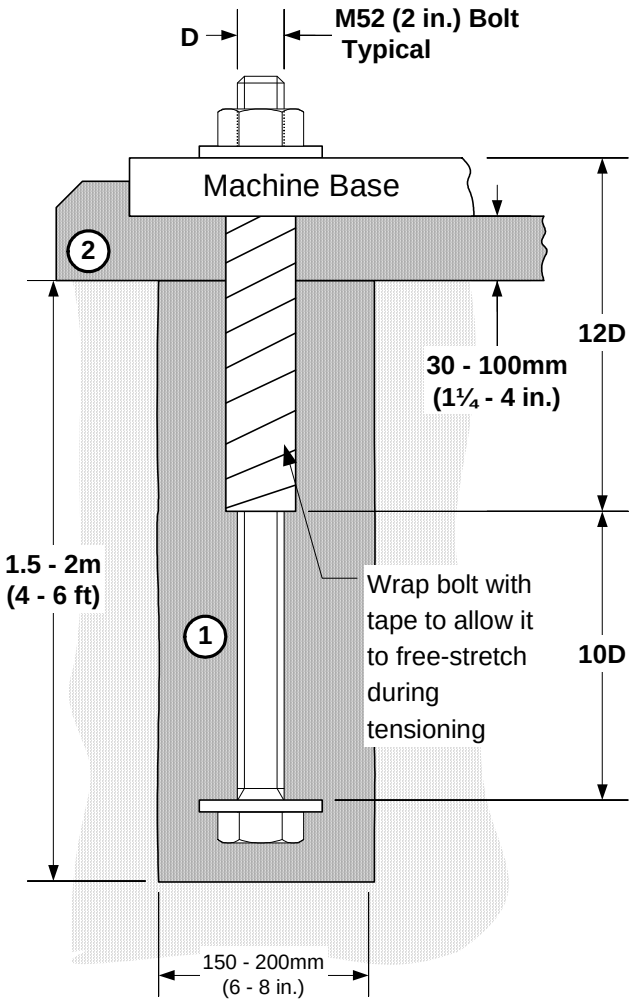
Design Considerations

Most process machinery is critically aligned within hundredths of a millimeter tolerance. Therefore, final horizontal leveling pours in contact with critically aligned baseplates, rails, soleplates or coupled machinery should be limited to a depth of 100mm (4").

Two separate grout pours are required:

① The first pour in the Anchor Bolt Pocket filled is made using CHOCKFAST® Red or ESCOWELD 7505E/7530

② The Final Leveling Pour under the critically aligned machinery is then made using CHOCKFAST® RED or ESCOWELD 7505E/7530



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Date 06/2006

General: Every reasonable effort is made to insure the technical information and recommendations on these data pages are true and accurate to the best of our knowledge at the date of issuance. However, this information is subject to change without notice. Prior versions of this publication are invalid with the release of this version. Products and information are intended for use by qualified applicators that have the required background, technical knowledge, and equipment to perform said tasks in a satisfactory manner. Consult your local distributor for product availability, additional product information, and technical support.

Warranty: ITW Polymer Technologies, a division of Illinois Tool Works Inc., warrants that its products meet their printed specifications. This is the sole warranty. This warranty expires one year after product shipment.

Warranty Claims: If any product fails to meet the above, ITW Polymer Technologies will, at its option, either replace the product or refund the purchase price. ITW Polymer Technologies will have no other liability for breach of warranty, negligence, or otherwise. All warranty claims must be made in writing within one year of the date of shipment. No other claims will be considered.

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Suggestions concerning the use of products are not warranties. The purchaser assumes the responsibility for determining suitability of products and appropriate use. ITW Polymer Technologies' sole liability, for breach of warranty, negligence or otherwise, shall be the replacement of product or refund of the purchase price, at ITW Polymer Technologies' election. Under no circumstances shall ITW Polymer Technologies be liable for any indirect, incidental or consequential damages.

Modification of Warranty: No distributor or sales representative has the authority to change the above provisions. No change in the above provisions will be valid unless in writing and signed by an officer or the Technical Director of ITW Polymer Technologies. No term of any purchase order shall serve to modify any provision of this document.

Mediation and Arbitration: If any dispute arises relating to products or product warranties, either the purchaser or ITW Polymer Technologies may a) initiate mediation under the then current Center for Public Resources (CPR) Model Procedure for Mediation of Business Disputes, or b) initiate a non-binding arbitration under the rules of the American Arbitration Association for the resolution of commercial disputes.

EQUIPMENT FOUNDATION SYSTEMS

Chockfast ESCOWELD

Cold Weather Grouting

Special Precautions

Technical Bulletin # 619A

Bulletin Description

CHOCKFAST and ESCOWELD grouts are specifically formulated for use where concrete and steel foundation temperatures at the time of application are within a range of 55° to 95° F (13° to 35° C). Should temperatures be below 55° F the following procedures should be followed.

Grout Storage

All grout materials shall be stored in a dry and weatherproof area prior to grouting. Under no circumstances should grouting materials be stored outside or in an area that cannot be heated to 55° F or above. For optimum handling characteristics, all materials (particularly aggregate portion) shall be adjusted to a temperature of 55° F to 80° F 48 hours prior to grouting. Aggregate bags shall be unstacked to allow for equal heating.

Preparation

The work area, including foundation and machinery, shall be preconditioned to a temperature above 55°F for 24 hours prior to grouting. This can best be accomplished by constructing a temporary structure around the work area with a suitable covering such as canvas or plastic sheet. The temperature of the concrete foundation and steel machinery shall be a minimum of 55°F prior to grouting.

Cure Time

The work area, including foundation and machinery, shall be held at a minimum of 55° F for 48 hours after placement of the grout. Heating sources (lamps, steam or gas heaters, etc.) shall not be positioned so as to create hot spots (localized heating) on the grout.

The following cure times are approximate and are dependent on the temperatures listed below remaining constant for the required amount of cure time.

CHOCKFAST RED or ESCOWELD 7505E/7530	**CHOCKFAST RED SG**
96 hours @ 50°F (10°C)	60 hours @ 50°F (10°C)
72 hours @ 55°F (13°C)	48 hours @ 55°F (13°C)
54 hours @ 60°F (16°C)	36 hours @ 60°F (16°C)
36 hours @ 72°F (21°C)	24 hours @ 72°F (21°C)
24 hours @ 80°F (27°C)	18 hours @ 80°F (27°C)
18 hours @ 90°F (32°C)	12 hours @ 90°F (32°C)

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Date 06/2006

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EQUIPMENT FOUNDATION SYSTEMS

Grout Compatibility with Concrete & Steel

Technical Bulletin # 638B

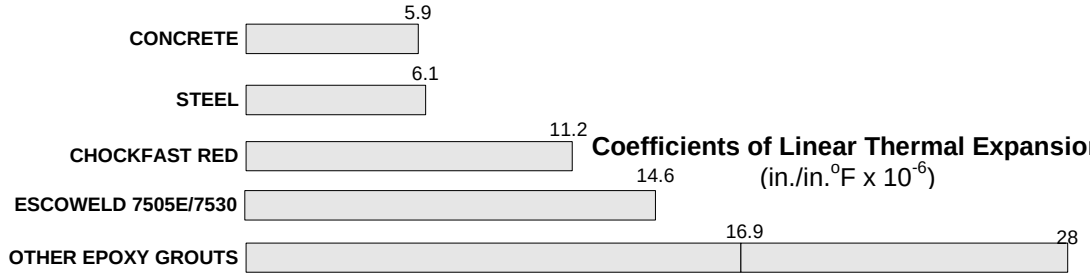
CHOCKFAST® Red & ESCOWELD 7505 E/7530

Bulletin Description

All major epoxy grouts on the market today have sufficient Compressive Strength to bear the weight of the equipment they support. It is more important compare grouts based on how compatible they are with both the concrete and steel it is connected to. Therefore, the most important design criteria for an epoxy grout are those physical properties that directly affect the grout's compatibility with concrete and steel; Coefficient of Linear Thermal Expansion and Peak Exotherm.

Coefficient of Expansion

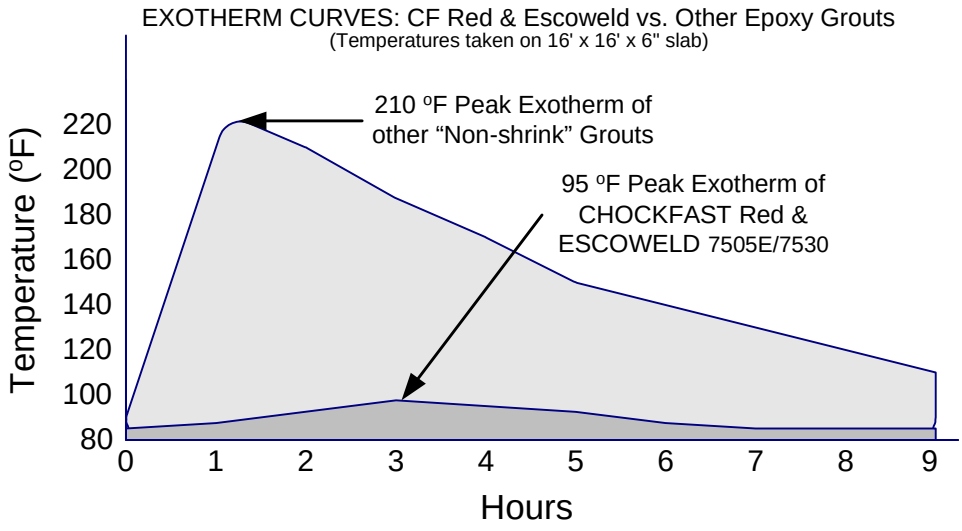
Coefficient of Linear Thermal Expansion (CTE) is the amount something will expand or contract when it is subjected to a 1°F increase or decrease in temperature. It is expressed in units of inch per inch, degree of temperature change of the material. The following is a listing of the CTE's for concrete, steel and various epoxy grouts as published by their respective manufacturers:



The closer the CTE of two materials are, the more compatible those materials are. They are compatible because they will tend to grow and shrink together as the outside temperature increases and decreases.

Peak Exotherm

Peak Exotherm (PE) is the maximum temperature that an epoxy reaches during its cure. This is also the point at which the epoxy changes from liquid to solid. The equipment operating temperature that produces no thermal stress is be equal to the peak exotherm temperature for that epoxy. For this reason CHOCKFAST RED and ESCOWELD 7505E/7530 were formulated to have the lowest peak exotherm possible (95°F to 130°F depending on depth).



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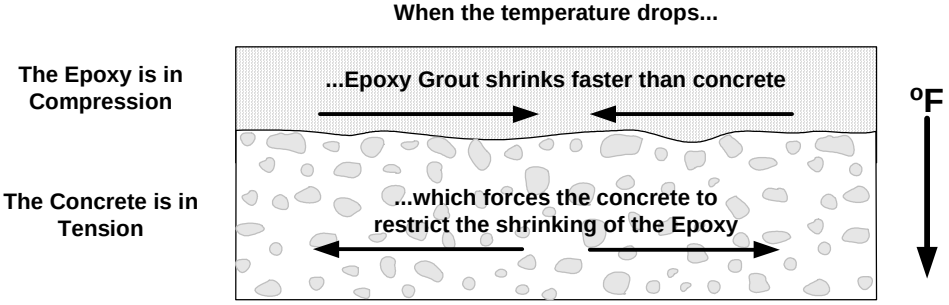
Application Instructions

Because CHOCKFAST Red and ESCOWELD 7505E/7530 are gently curing epoxy grouts, their peak exotherm temperatures are usually very close to the foundation temperature underneath operating equipment. This small difference between the peak exotherm temperature and the operating temperature results in minimum foundation stress.

When machinery is not operating, freezing conditions may occur. In this case, the epoxy grout will want to contract more than the concrete or steel because it has a higher CTE's. As a result of the epoxy bond to the concrete, the epoxy will be put into compression and the concrete into tension.



If the temperature drops far enough, the epoxy may build up sufficient tension to crack, or shear the bond line with the concrete. By using expansion joints installed in accordance with ITW Philadelphia Resins' procedures, stress cracking can be avoided and longer life can be expected from properly designed foundations. Please see Bulletins No. 662 and 645 for more information on expansion joints.

Example Calculating Linear Contraction of Epoxy

The following example calculates the Linear Contraction of epoxy grout starting at the grout's Peak Exotherm and returning to a foundation temperature of 70°F. The formula for Linear Contraction is:

Linear Contraction (in/in) = Coefficient of Thermal Expansion (CTE) X Change in Temperature (ΔT)

Grout	CTE	ΔT (PE - 70°)	Linear Contraction
CHOCKFAST RED	11.2×10^{-6} in/in/°F x	(95 - 70)°F =	28.0×10^{-5} in/in
Other Grout	27.0×10^{-6} in/in/°F x	(210 - 70°)F =	378.0×10^{-5} in/in

This shows that the linear contraction of the competitive grout is 13 times as more than the linear contraction of the CHOCKFAST Red. Of course, if the foundation temperature were 95°F, there would be no linear contraction of CHOCKFAST Red.

Conclusion

A foundation that is healthy over the long-term is the result of a low peak exotherm coupled with a low Coefficient of Linear Thermal Expansion. CHOCKFAST Red and ESCOWELD 7505E/7530 were formulated to maintain these properties in single pours 18" deep if necessary. The compatibility of these grouts with concrete ensures a problem-free foundation for many years of operation

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

Chockfast

The Goal ⇒ Maintain Alignment

How CHOCKFAST® Helps Maintain Alignment

Technical Bulletin # 639B

Bulletin Description

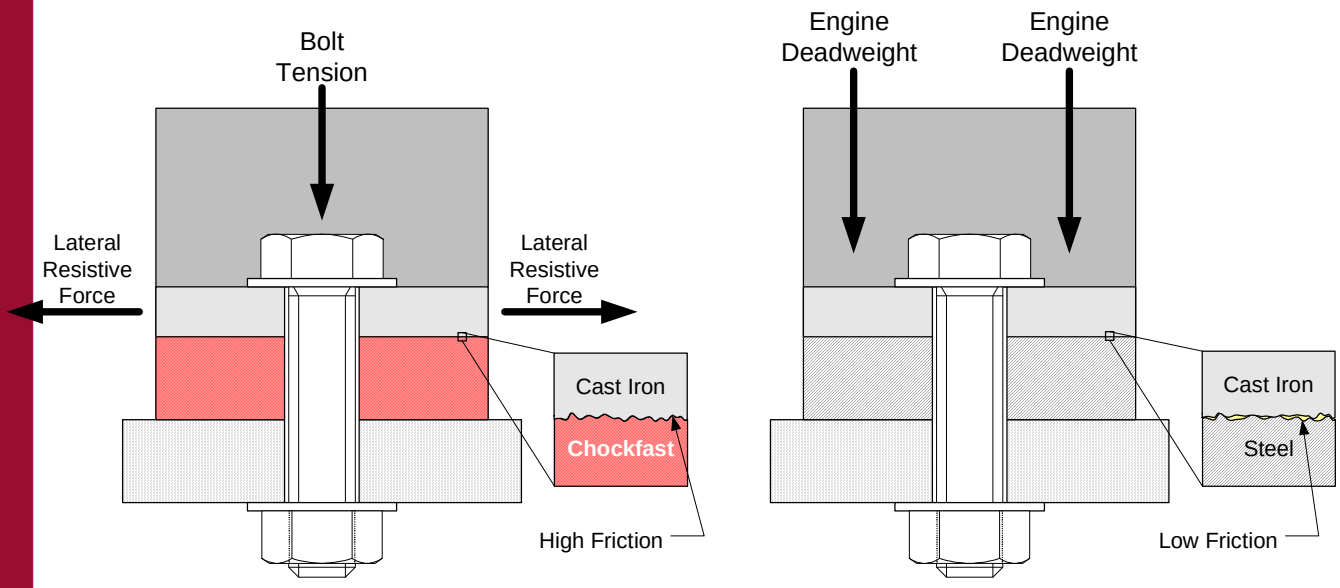
Maintenance of alignment in reciprocating machinery such as large diesel engines and compressors is of critical importance to operators. Without it, the possibility of broken crankshafts, worn bearings and associated machinery downtime greatly increases.

Benefits of CHOCKFAST

With CHOCKFAST Resin Chocks, the maintenance of equipment alignment is improved dramatically when compared to installations that use steel chocks. There are many cases of improved alignment provided by CHOCKFAST when used as a direct retrofit for steel chocks under troublesome engines.

Reasons For Success

The key reason for the success of CHOCKFAST Resin Chocks is that they produce a higher lateral resistive force when compared to steel chocks under cast iron bedplates. The coefficient of friction between CHOCKFAST Resin Chocks and cast iron is 0.7 as compared to 0.15 for steel to cast iron. An independent engine manufacturer during an extensive test program (Sulzer Brothers - Winterthur, Switzerland), established these coefficients. The following examples illustrate the superior total lateral resistive forces derived from the use of resin chocks:



Engine Deadweight plus Bolt Tension work to hold the engine in place.
Friction also helps hold the engine in place.
Friction plus Engine Deadweight plus Bolt Tension = Total Lateral Resistive Force
The higher the Total Lateral Resistive Force, the higher the forces available to maintain alignment.

Because CHOCKFAST fills every little crease and crevice in the mounting foot, the friction between CHOCKFAST and cast Iron is much larger than between steel and cast iron.

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Examples

Let's compare the total resistive force available from CHOCKFAST Resin Chocks to steel chocks for three Diesel Engines:

Example 1: DRESSER CLARK HBA8

Engine Deadweight = 170,000 lbs.
Hold Down Bolts & Tension Per Bolt = (19) 1-1/2" Main Frame Bolts @ 25,560 lbs/bolt

Assume all load is on (19) - 10" x 10" Main Frame Chocks

Total Normal Load = Engine Deadweight + All Bolt Tensions = 170,000 lbs + 19 x 25,560 lbs.= 655,640 lbs

Total Resistive Force Of CHOCKFAST Resin Chocks To Cast Iron Engine Bedplate = Coefficient of Friction of CHOCKFAST Resin Chocks to Cast Iron x Total Normal Force = 0.7 x 655,640 lbs= 458,948 lbs

Total Resistive Force Of Steel Chocks To Cast Iron = Coefficient of Friction of Steel Chocks to Cast Iron x Total Normal Force = 0.15 x 655,640 = 98,346 lbs.

Forces available to help hold alignment: 1) with CHOCKFAST Resin Chocks = **458,948 lbs.**
2) with steel chocks = **98,346 lbs.**

Example 2: COOPER ENERGY 16V-250

Engine Deadweight = 270,000 lbs.
Hold Down Bolts & Tension Per Bolt = (20) 2" Main Frame @ 45,500 lbs./bolt

Assume all load is on 20 Main Frame Chocks

Total Normal Load = Engine Deadweight + All Bolt Tensions = 270,000 lbs.+ 20 x 45,500 = 1,180,000 lbs.

Total Resistive Force Of CHOCKFAST Resin Chocks To Cast Iron Engine Bedplate = Coefficient of Friction of CHOCKFAST Resin chocks to Cast Iron x Total Normal Force=0.7 x 1,180,000 lbs=826,000 lbs.

Total Resistive Force If Steel Chocks Used = 0.15 x 1,180,000 lbs. = 177,000 lbs.

Forces available to help hold alignment: 1) with CHOCKFAST Resin Chocks = **826,000 lbs.**
2) with steel chocks = **177,000 lbs.**

Example 3: INGERSOLL RAND KVG-412

Engine Deadweight = 140,000 lbs.
Hold Down Bolts & Tension Per Bolt = (18) 1-1/2" Main Frame Bolts @ 25,560 lbs./ bolt

Assume all load is on 18 Main Frame Chocks

Total Normal Load = Engine Deadweight and Total Bolt Tensions = 140,000 + 18 x 25,560 = 600,080 lbs.

Total Resistive Force Of CHOCKFAST Resin Chocks To Cast Iron Engine Bedplate = Coefficient of Friction of CHOCKFAST Resin Chocks to Cast Iron x Total Normal Force = 0.7 x 600,080 lbs=420,056 lbs.

Total Resistive Force If Steel Chocks Used = 0.15 x 600,080 lbs. = 90,012 lbs.

Forces available to help hold alignment: 1) with CHOCKFAST Resin Chocks = **420,056 lbs.**
2) with steel chocks = **90,012 lbs.**

CONCLUSION: CHOCKFAST resin chocks provide 4 to 5 times the resistive force of steel chocks.

Date

06/2006

EQUIPMENT FOUNDATION SYSTEMS

Installing Grout & Chocks

In Industrial Applications

Technical Bulletin # 642H

Bulletin Introduction

The following CHOCKFAST and ESCOWELD Installation Procedures have been written as an aid for contractors and end-users that are applying epoxy grout in the field. Proper pour sizes, the use of expansion joints, and temperatures are emphasized in this bulletin.

Application procedures are included for ESCOWELD 7505E/7530, CHOCKFAST Red, CHOCKFAST Red SG, CHOCKFAST Blue, CHOCKFAST Black and CHOCKFAST Orange. The procedures are described in a sequence that follows Bulletin No. 643 entitled "*Standardized CHOCKFAST Design For Integral Gas Engine Compressors.*" If only one product is being used, the section describing the application of that particular product may be used independently.

These procedures may be followed, modified or rejected by the Owner, Engineer, Contractor or their Representative since they and not ITW Polymer Technologies are responsible for proper grout installation planning and executing. When the planned procedures differ from those discussed herein, the User is urged to contact the local ITW Polymer Technologies Distributor or ITW Polymer Technologies to discuss alternate methods.

Preparations For Grouting

The following applies to all types of grouts.

Grout should be stored in a shaded or air-conditioned area with ambient temperatures between 65°-95°F (16°- 35°C).

New concrete foundations must be adequately cured before setting mechanical units. ITW Polymer Technologies will not assume the responsibility for the foundation design, concrete formulation, or structural integrity of the machinery foundation. Tensile strength and dimensional stability in particular develop slowly, so allow ample time for proper concrete curing. Consult a CHOCKFAST / ESCOWELD Representative in reference to concrete cure times.

Under no circumstances should oil, grease, water, etc soil the surface of the foundation.

To achieve good grout bond, chip concrete foundation to a rough finish, exposing 50% aggregate (fractured, course aggregate), using a small chipping hammer or equivalent. Avoid deep holes or grooves that could hinder the flow of grout.

Remove loose concrete pieces from the top of the foundation and from within the grout pockets. All surfaces to come in contact with the grout must be blown clean of dust and particles with *oil-free air* or swept with bristled brush.

Surfaces to be grouted should be kept dry. If foundation should be left overnight, tarp surface to prevent dew moisture and surface contamination from other operating machinery.

The bedplate should be clean, bright metal. Although CHOCKFAST Black and Orange are designed to eliminate the need for costly machining of bedplates, proper smoothing of sharp frets left by previous steel chocks or pock marks left by previously used cement grouts is important. Any sharp frets on the equipment baseplate must be ground off smooth to avoid potential cracks in the epoxy chock.

Bedplates should be inspected while the maximum amount of space is available between chipped concrete and the raised equipment. Badly corroded bedplates should be sandblasted to a white metal finish. ITW Repair Compound should be faired into pockmarks left by the corrosive influence of cement grouts.

12 times the anchor bolt diameter from the top should be wrapped with 1/4" thick neoprene foam rubber. This will prevent epoxy grout from sticking to the bolt and allow it to free stretch when tensioned and to allow for baseplate thermal growth. The 1/4" neoprene rubber should be used all the way to the bottom of machinery bedplates when isolating bolts. See Bulletin No. 660 entitled "Common Hold Down Bolt Arrangements" for more information on the grouting of hold down bolts. For grouting large anchor bolts (typically 2" or M52) see Bulletin No. 615.

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Wooden forms need to be carefully constructed to prevent leakage. Where removal of forms will be required, coat inside of wooden form with sealer (lacquer) and then 2 coats of a good paste wax to prevent adhesion of grout.

For installations of CHOCKFAST Red OR ESCOWELD 7505E/7530, expansion joints should be provided at least every 7' (2.15m) in both directions. On all installations where the cured grout temperature may drop to 55°F (13°C) or below, the expansion joint spacing should not exceed 3'6" (1.1m). For installations of CHOCKFAST Blue, expansion joints should be provided at least every 42" (1.1m) and pours should not normally exceed 42" x 42" x 1-1/2" thick (1.1m x 1.1m x 36mm thick).

Expansion joints must go completely through the epoxy grout to the underlying concrete foundation. Expansion joints can be made from rigid Styrofoam, redwood, neoprene rubber, etc., but in any case, must be oil tight. Expansion Joint Compound should be used to seal expansion joints, so please see Bulletins 645 and 662 for information on this product and on expansion joints in general.

Where CHOCKFAST Blue is used as an overlay on top of CHOCKFAST Red, the expansion joints in both products must coincide with each other. Under no condition should the CHOCKFAST Blue bridge an expansion joint in the CHOCKFAST Red. The expansion joint must be effectively sealed to protect the underlying concrete against penetration by oil or other contaminants. It is highly recommended that a secondary seal be incorporated into the expansion joint design with the use of Expansion Joint Compound material. Guidance on expansion joint design and complete information on EXPANSION JOINT COMPOUND may be found in Bulletins No. 645 and 662.

Warning: Expansion joints should not be placed near anchor bolts, be bridged by sole plates or rails, or be penetrated by rebar. To do so defeats the purpose of the expansion joint. Some equipment manufacturers require that their equipment be mounted on continuous rails. In this case it may be advantageous to provide for longitudinal growth of the rail with the implementation of abbreviated expansion joints located at each end of the rail.

Steel reinforcing bars, known as rebar, are a familiar feature of concrete structures. They are used to improve the tensile and shear strength of the structure. The coefficients of linear thermal expansion of steel and concrete are similar and compatible, but epoxy resin products have a coefficient two to five times as great and this can cause cracks to form.

The tensile strength of epoxy grout is at least six times that of concrete, the shear strength at least five times, so horizontal rebar is not as important as it is with concrete. In fact, the use of horizontal rebar is NOT recommended when using epoxy grouts.

Where significant unloaded areas of ESCOWELD 7505E/7530, CHOCKFAST Red or CHOCKFAST Blue will occur it is advisable to tie them to the concrete with short vertical pieces of rebar or "All-Thread" rod. **This should always be done on new concrete**, at corners and edges in general and prevents tensile failure of the concrete. Where possible the dowels should be arranged as follows: 12" apart; 3" in from the edge of foundation and not closer than 1" from the top surface of the epoxy grout.

CHOCKFAST Red Pouring Procedures

CHOCKFAST Red is a three-component, high-strength, 100% solids, epoxy grouting compound. See Technical Bulletin No. 617 for its Physical Properties.

To ensure proper mixing and pouring viscosity of the CHOCKFAST Red system, pre-condition the resin, hardener and aggregate at 65°-95°F (18°-35°C) for 48 hours prior to mixing. It is extremely important to pre-condition the CHOCKFAST Red aggregate as they will determine the temperature of the grout mixture.

Pour the CHOCKFAST Red hardener into the CHOCKFAST Red resin and mix 3-4 minutes with a "Jiffy" type mixing blade and a 1/2” (12 mm) slow speed drill motor. Prior to starting the drill, completely submerge the mixing blade into the liquids. This will prevent the formation of air bubbles that could be transferred into the final product.

Caution: Under no circumstances should the mixing of the CHOCKFAST Red resin and hardener be attempted in the mortar mixer.

CHOCKFAST Red should be mixed with a slow speed (15-20 rpm) portable mortar mixer of sufficient size to enable the mixing of two complete units 3.2 cu.ft. (90.6 liters) of CHOCKFAST Red epoxy grout. Mixing quantities greater than two units in a single mortar mixer is not recommended due to of the increased chance for proportioning error.

With the blades of the mortar mixer stopped, add the pre-mixed resin and hardener and one (1) bag of aggregate. The blades of the mortar mixer may be started at this time.

Progressively add the remaining aggregate assuring a homogeneous mix. **Note:** On the initial first unit mix, a 1/2 bag of aggregate, 23 lb. (10.4 kilograms) should be withheld to facilitate wetting out of the mortar mixer.

It is important to minimize air entrapment in the mixed unit of CHOCKFAST Red, therefore a mortar mixer speed of 15-20 rpm is recommended. When the CHOCKFAST Red resin, hardener and aggregate have been pre-conditioned to 70ºF (21ºC) or above, the grout material should be mixed only long enough to wet out the 4 bags of aggregate. When the CHOCKFAST Red components are below 70ºF (21ºC) a slightly longer mixing time may be necessary to obtain a suitable flowability. Unnecessarily long mixing time can entrap an excessive amount of air. Once the CHOCKFAST Red is thoroughly mixed the blades of the mortar mixer should be stopped. To facilitate unloading of the mortar mixer bucket, the blades may be rotated slightly after the bucket has been tilted to assist in rapid grout extraction from the mixer.

Note: Small quantities of CHOCKFAST Red (one unit at a time) may be hand mixed in a wheelbarrow with a hoe. Mix the resin and hardener separately as outlined in paragraph 2.

Pour the CHOCKFAST Red as soon as possible after mixing. The pot life of this product is approximately 2-3 hours at 70°F (21°C). Although CHOCKFAST Red is generally self-leveling, at temperatures below 65°F (18°C) rakes or paddles can easily be used to achieve complete filling of prepared areas. CHOCKFAST Red may be used at thicknesses between 2.0" (50mm) and 18" (450mm). Individual pours should generally not exceed 18" thick x 7' long x 7' wide (450mm thick x 21.5m long x 2.15m).

Cure time for CHOCKFAST Red is as follows:

54 hours @ 60°F (16°C)
36 hours @ 70°F (21°C)
24 hours @ 80°F (27°C)
18 hours @ 90°F (32°C)

Protect recently poured grout from any sudden temperature changes and direct sunlight.

Additional layers of CHOCKFAST Red may be poured providing the previous pour has returned to ambient temperature and its surface has been roughed up with a chipping hammer, sand blasting or other approved means.

If a cap of CHOCKFAST Blue is to be poured onto the CHOCKFAST Red it may be poured as soon as the CHOCKFAST Red will support firm thumb pressure yet allow a slight denting of the CHOCKFAST Red surface, and still has a tacky feel to it. This will enable the two grouts to both chemically and physically bond.

ESCOWELD Pouring Procedures

The Pouring Procedures for ESCOWELD 7505E/7530 are exactly the same as CGOCKFAST Red.

CHOCKFAST Red SG Pouring Procedures

CHOCKFAST Red SG is a three component, high strength, 100% solids epoxy grouting compound which is used to grout large machinery and to support soleplates in all types of foundation designs with clearances as little as 25mm (1"). CHOCKFAST Red SG has extremely high physical properties and negligible shrinkage, making it ideal for final positioning of critically aligned equipment within close tolerances. Skid mounted compressors, extruders, turbines, pumps, motors and crane rails are just a few types of equipment supported on CHOCKFAST Red SG.

CHOCKFAST Red SG may be used in any thickness greater than 1" (25mm); however, individual pours should generally not exceed 4" (100mm) in thickness and (5'1.5m) in length. Expansion joints should be provided at least every 5ft. (1.5m). When using CHOCKFAST Red SG for crane rail applications expansion joints may be placed every 10' (3m).

The same mixing and pouring procedures used for CHOCKFAST Red should be used with CHOCKFAST Red SG.

CHOCKFAST Blue Pouring Procedures

CHOCKFAST Blue is a two-component, 100% solids, pourable epoxy-based grouting compound containing aggregate that is most commonly used for severe applications.

When pouring CHOCKFAST Blue on top of CHOCKFAST Red one of the following procedures should be followed: 1) CHOCKFAST Blue may be poured directly on CHOCKFAST Red when the CHOCKFAST Red will support firm thumb pressure, yet allow a slight denting in its surface, and still have a tacky feel. This will allow the two grouts to chemically as well as physically bond. 2) If the CHOCKFAST Red has become hard then the surface must be abraded by chipping or sandblasting to establish a suitable surface profile, prior to pouring the CHOCKFAST Blue.

CHOCKFAST Blue contains aggregate pre-mixed into the resin. To ensure proper mixing and pouring viscosity, rotate the resin container upside-down during the pre-conditioning period to aid in mixing. This will compensate for the aggregate that may have settled during storage and transportation. Thoroughly mix hardener and resin until homogeneous color and texture is apparent (3-1/2 to 4 minutes) using a KOL mixer or large Jiffy mixer blade in 3/4" (18 mm) drilling machine. It is important that the KOL mixer blade contact the entire surface on the inside and bottom of the CHOCKFAST Blue can to insure a homogeneous mix. **Never scrape mixed material from the sides or bottom of the container**.

Use grout as soon as possible after mixing. CHOCKFAST Blue pot life is approximately 35 to 50 minutes at 70°F (21°C). Cure time for CHOCKFAST Blue is as follows:

36 hours @ 60°F (16°C)
24 hours @ 72°F (21°C)
16 hours @ 80°F (27°C)
12 hours @ 90°F (32°C)

NOTE: For additional design considerations, please see Technical Bulletin No. 643 entitled “CHOCKFAST Foundation Design for Gas Engine Compressors."

CHOCKFAST Black Pouring Procedures

CHOCKFAST Black is a specially formulated 100% solids, two-component, inert-filled casting compound, developed for use as a chocking or shimming material.

Once the machinery is in position and aligned, install appropriately sized dams around each anchor bolt to create a mold for the chocks. Dams are typically made from strips of open-cell foam strip placed under the machinery on the sides and back of the mold. It may be convenient to glue these strips to the underside of the machinery if it is to be lowered into position. The desirable chock thickness is 50mm (2"). Foam rubber dams should be checked with a flashlight for tightness.

Jacking bolts which are inside the chock area must be wrapped with duct tape to isolate them from the epoxy chock.

An aerosol release agent, as supplied by ITW Polymer Technologies, should be sprayed into each prepared chock area. Only spray enough release agent to provide a fine misting of the chock area without puddling.

Front dams should now be positioned. Angle iron should be used and it should be large enough to allow for a 3/4" (20 mm) head above the machinery bedplate surface. Dams should be positioned between 3/4" (20 mm) and 1" (25 mm) away from the bedplate edges.

The overpour area on each chock can be cut off with an abrasive disc in order to provide easy inspection of chock/machinery interfaces and eliminate possible cracking from lateral expansion of equipment

NOTE: For appropriate sizing of chocks, please see Bulletin No. 643 entitled "Standardized CHOCKFAST Design for Integral Gas Engine Compressors" or contact ITW Polymer Technologies' Engineering Department or your Authorized CHOCKFAST Distributor.

Equipment alignment and bolt integrity are the responsibility of the equipment owner.

Add the complete container of hardener to resin. A small or medium Jiffy mixer blade, supplied by ITW Philadelphia Resins, inserted in a 1/2" (12 mm) variable speed drill is recommended for mixing.

Maximum drill speed should be kept below 250 rpm in order to minimize air entrapment and mixing time should be 3 to 4 minutes.

Pour mixed materials into chock mold, from one corner only, to maximize the escape of air through the opposite corner. The air will migrate through the open-cell foam damming and assure good surface contact with the equipment bedplate. **Never scrape mixed materials from the sides or bottom of the container when pouring.**

5. Before torquing bolts and executing final alignment check, allow chocks to cure at least:

48 hours @ 60°F (16°C)
36 hours @ 65°F (18°C)
24 hours @ 70°F (21°C)
21 hours @ 75°F (23°C)
18 hours @ 80°F (26°C)
15 hours @ 85°F (29°C)
12 hours @ 90°F (32°C)

NOTE: A good test for proper cure is to test with a Barcol hardness gauge if there is a question regarding cure. A **MINIMUM** Barcol reading of 24 on CHOCKFAST Black indicates that sufficient cure has been achieved to allow release of jacking screws and torque of hold down bolts.

CHOCKFAST Orange Pouring Procedures

The standard pour thickness for a CHOCKFAST Orange epoxy chock is 1-1/4" (31mm). Should the designed thickness be greater than 2-3/4" (70mm) please consult the CHOCKFAST Representative or ITW Polymer Technologies. The amount of hardener mixed with the CHOCKFAST resin must be measured according to chock thickness and equipment baseplate temperature.

Refer to Bulletin NO. 693 for hardener proportioning. All other procedures for the use of CHOCKFAST Orange are the same as for CHOCKFAST Black, ie, preconditioning, sizing chocks, forming, mixing, curing, etc.

Reference

For design considerations and application details please request Bulletin No. 643 entitled "Standard Chock Design for Integral Gas Engine Compressors." or contact ITW Polymer Technologies' Engineering Services Department.

Date

06/2006

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EQUIPMENT FOUNDATION SYSTEMS

Standard Chock Design

For Integral Gas Compressor Engines

Technical Bulletin # 643E

Bulletin Description

There are a number of combinations and methods of installing CHOCKFAST grout to mount equipment. The method chosen usually depends on the type of equipment, the loads, operating temperature and mounting arrangement. There is, however, one standard or preferred method of grouting that ITW Polymer Technologies feels is optimal for most integral gas compressor engines. The Preferred Chock Design for new engine / compressor installations or repairs under old engines has the following components:

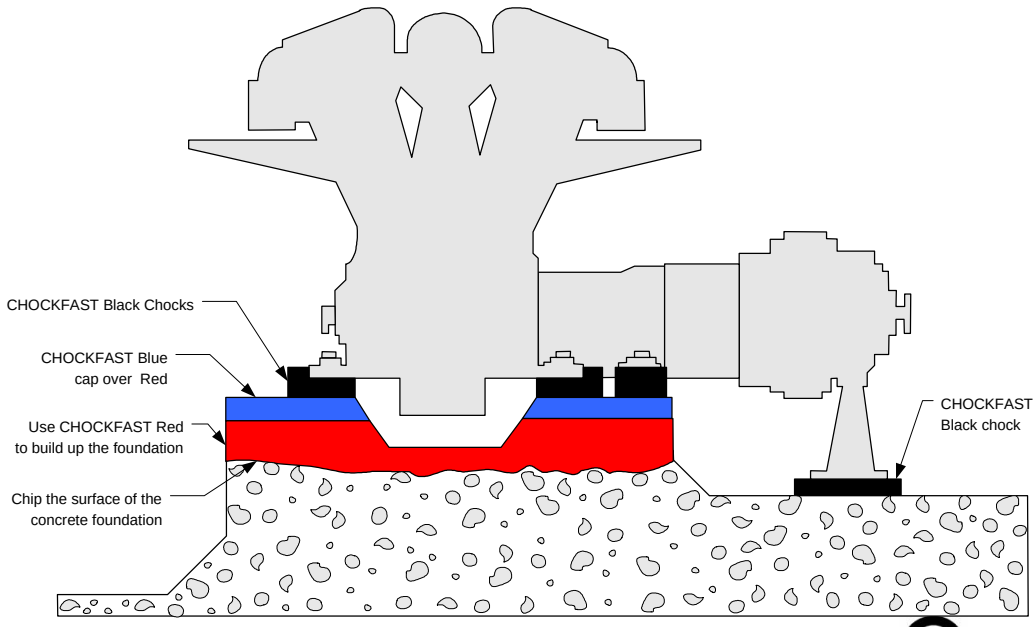
- CHOCKFAST Red or Red SG, if necessary, to bring the foundation up to the appropriate level.
- CHOCKFAST Blue to provide a high-strength, temperature resistant cap on top of the CHOCKFAST Red.
- CHOCKFAST Black or CHOCKFAST Orange as individual chocks around the anchor bolts.

Design For New Engine Foundations

Pour the new concrete foundation to within 3-1/2" (90 mm) of final height of the bottom of the engine bedplate. Allow the concrete to cure for at least 21 days under proper temperature and moisture conditions so it achieves full strength.

After the concrete is completely cured, divide the foundation into controlled sections with maximum dimensions of 1-1/2" (40mm) thick x 42" (1.1m) long x 42" (1.1m) wide. Closed-cell neoprene foam rubber works well as an expansion joint. Mix and pour the CHOCKFAST Blue 1-1/2" (40mm) thick over the concrete to provide a high-strength cap. Allow the grout to cure at least one day. (Please see Bulletin No. 642 entitled "CHOCKFAST Installation Procedures" for additional information on constructing forms, mixing and pouring CHOCKFAST.)

After the CHOCKFAST Blue has fully cured, build a mold under the engine and on either side of each anchor bolt for the CHOCKFAST Black. Each chock will be approximately 2" (50mm) thick and will typically extend the full width of the baseplate. The length of each chock is determined based on the Total Chock Area that will keep the Total Chock Loading (deadweight plus the sum of all bolt tensions) ≤ 500 psi (35 kg/cm^2). Use either the engine manufacturer's recommended bolt tension or the Rule of



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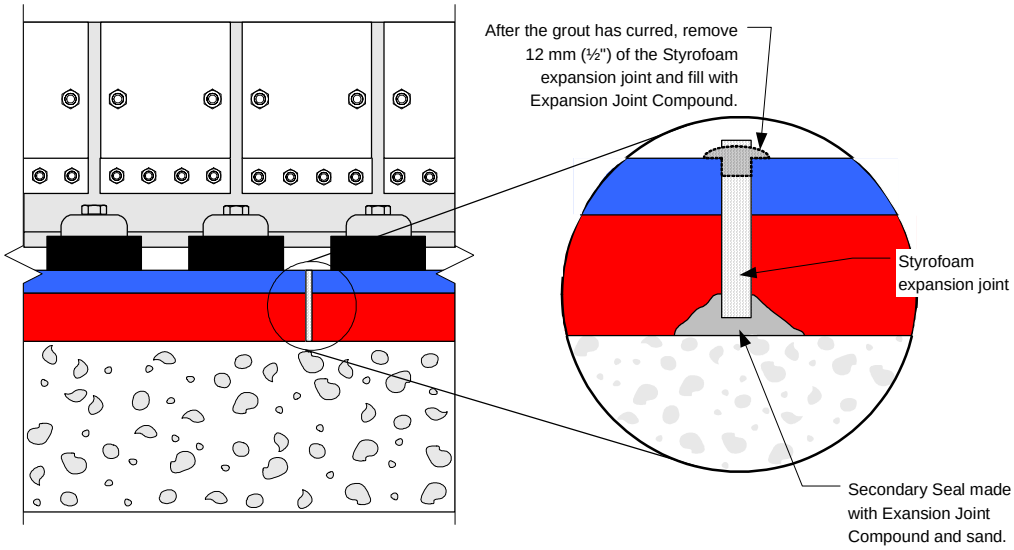
Thumb that says the sum of all bolt tensions must be ≥ 4 times the deadweight of an integral gas compressor engine or ≥ 2-1/2 times the deadweight of a standard diesel engine.

After final check of machinery alignment mix and pour CHOCKFAST Black into each as directed. CHOCKFAST Orange may also be used to create the individual chocks.

Design For Rebuilt Engine Foundations

Chip out all oil saturated and cracked concrete until strong, clean concrete is exposed. Build a form around the foundation so the CHOCKFAST Red rebuilds the foundation to within 3-1/2" (90 mm) from the machinery bedplate surface to allow capping with CHOCKFAST Blue and CHOCKFAST Black epoxy chocks.

Create controlled sections on top of the concrete by dividing the area to be filled with expansion joints. When using CHOCKFAST Red, the maximum recommended size for each section is 18" (450 mm) thick x 7' (2.15 m) long x 7' (2.15 m) wide. Expansion joints can be made quickly and easily with 1" (25mm) thick closed cell Styrofoam sheet or 3/4" (18 mm) redwood. Expansion Joint Compound should be used to seal the top and bottom of expansion joint. Wait between consecutive layers until the underlying layer has cooled back to below 85°F (29°C) or ambient.



After the underlying layers of CHOCKFAST Red have cured, pour a CHOCKFAST Blue cap 1-1/2" (40mm) thick over the top of the Red. CHOCKFAST Blue should be poured in controlled sections with maximum dimensions of 1-1/2" (40mm) thick x 42" (1.1m) long x 42" (1.1m) wide. Closed-cell neoprene foam expansion joints or anchored with Expansion Joint Compound slurry are used. (Please see Bulletin No. 642 entitled "CHOCKFAST Installation Procedures.")

After a final check of the machinery alignment subsequent to pouring CHOCKFAST Blue, 2" (50mm) thick CHOCKFAST Black chocks are poured. When this CHOCKFAST has completely cured, back out the jacking bolts and torque the compressor's anchor bolts should be tensioned to either the manufacturer's recommendation or the Rule-of-Thumb that the total bolt tension ≥ 4 times the deadweight of the complete compressor should be used. In both cases, the total static load on the chocks (deadweight plus total bolt tension) 500 psi (≤ 35 kg/cm2).

NOTE: There may be reasons to deviate from this standard such as lack of sufficient bedplate area or unusually rough running that require higher loading. **Please consult the CHOCKFAST representative or ITW Polymer Technologies before deviating from the standard recommendation.**

CHOCKFAST Orange can be used in place of CHOCKFAST Black. In fact, CHOCKFAST Black superceded Orange for standard compressor installations, as CHOCKFAST BLACK is easier to use and provides improved heat dissipation in the foundation. CHOCKFAST Orange is available for special applications where its lower viscosity and variable hardener ratio are advantageous. Standard pour thickness for Orange is 2" (50mm) and loading parameters are identical to CHOCKFAST BLACK.

Alternative Designs

As you can see from the above, soleplates or rails are not included in the Preferred Design. Soleplates, however, may already exist or be required by the customer as part of a new or repair chocking. When soleplates are required they can be grouted in place using CHOCKFAST Blue following the Preferred Design in other respects and allowing 1-1/2" (40mm) of grout under the soleplate. Existing soleplates that are still securely grouted can have steel chocks replaced by CHOCKFAST BLACK or CHOCKFAST ORANGE.

If changes in cross section have to be made to accommodate jack pockets, pipe lead-throughs, etc., it is important that no sharp corners be created in the CHOCKFAST. At least 2" (50mm) radius curves should be used. Similarly, all soleplate or rail edges immersed in the CHOCKFAST should be radiused. It is prudent to put a divider where a crack may be initiated.

Special circumstances may require other methods to be used. The CHOCKFAST system is versatile, but only experienced persons should consider departing from ITW Polymer Technologies' recommendations.

There are times when continuous grouting under the equipment bedplate is required rather than individual chocks. In these cases there is typically a concern over the inherent rigidity of an engine. When continuous grouting is required for integral gas engine compressors or diesel engines, ITW Polymer Technologies recommends using CHOCKFAST Blue for the final 1-1/2" (40mm) grouting layer directly in contact with the bedplate. Controlled sections should be used as described previously and CHOCKFAST RED should also be used if deeper repair is necessary.

*__NOTE:__ The above parameters are the parameters within which we like to operate and they provide for an inherently conservative design. There are circumstances, such as unavailability of bedplate area, which cause loadings to rise. **Please contact ITW Polymer Technologies with regard to special circumstances.**

Date

06/2006

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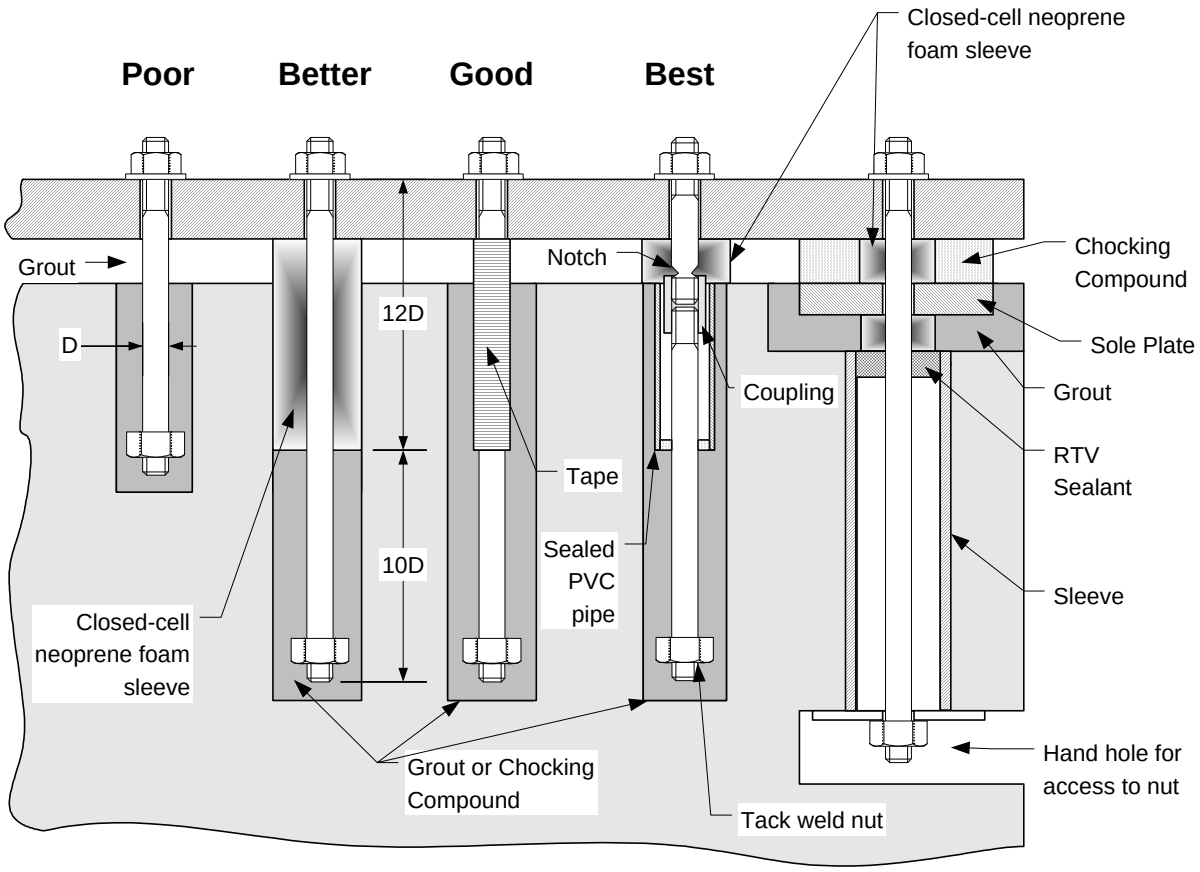
EQUIPMENT FOUNDATION SYSTEMS

Common Hold Down Bolt Arrangements

Technical Bulletin # 660A

Bulletin Description

These illustrations represent hold down bolt arrangements commonly encountered in the installation of equipment and machinery with which CHOCKFAST and ESCOWELD products are used.



Date

08/2005

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EQUIPMENT FOUNDATION SYSTEMS

Injecting Resin Into Cracks in Concrete

Technical Bulletin # 661F

Bulletin Description

Cracking of concrete slabs and substrates is a common occurrence. Excessive tensile and compressive forces, freeze-thaw cycles, and incorrect water to cement mix ratios are common causes. One practice to repair cracks is to pressure inject thermosetting resin into them. This bulletin describes several techniques for repairing minor cracks in concrete foundations prior installing equipment.

Repair Techniques

The basic technique used to repair a crack starts with drilling a hole at each end of the crack. The holes should have a diameter that is wider than the crack. They will act as an injection point at one end and a vent point at the other. The holes will also relieve stress in the concrete and will help prevent the crack from spreading.

Additional holes should be drilled every 8 to12 inches along the crack. As each hole is used as an injection point with the adjacent hole acting as the previous hole's vent. Zirc fittings or injection ports should be placed in the injection holes.

The fittings can be secured with either PHILLYBOND #6 or Repair Compound. The fittings or ports should allow a grease gun hose to screw onto the fitting.

Once the fill and vent points have been prepared, the exposed crack must be sealed. All loose or contaminated concrete in and around the crack must be removed by chiseling it out with a hammer and chisel. Once this step is completed, cover the top of the crack with either PHILLYBOND #6 or REPAIR COMPOUND. Use PHILLYBOND #6 if pressure injecting into the crack that day as it cures quickly. REPAIR COMPOUND requires overnight to cure. Once the material used to seal the crack has cured, pressure injection of a thermosetting resin liquid into the crack can commence.

Several resin systems can be used to fill cracks in concrete including CONCRETE ADHESIVE, PHILLYCLAD,1775/620TS, CHOCKFAST RED LIQUIDS. Please see the individual product Technical Bulletins for details on unit size and coverage. CHOCKFAST Gray can also be used for to fill cracks greater than 1/8 inch in width.

Carefully mix the resin and hardener per manufacturer's instructions. Pour the mixed material into a clean grease gun or a fill-able caulking cartridge and begin pressure injecting at one end of the crack. Continue to inject resin until it begins to come out of the adjacent hole. Once resin appears in is hole inset a zirc fitting into it and continue injection into that hole. Continue this process the entire length of the crack.

Epoxy resin cures through an exothermic reaction. The resin will begin to generate heat once the curing cycle begins. If the grease gun or airless pump begins to become warm, immediately clean the equipment with a suitable solvent such as IMPAX IXT-59. Failing to do so may result in loss of equipment. When finished IMPAX IXT-59 can be used for general clean up.

Reference

For details on the epoxies mentioned above please request Bulletin No. 950 for PHILLYCLAD 1775/620TS, No. 1014 CONCRETE ADHESIVE, No. 1015 REPAIR COMPOUND or No. 964 PHILLYBOND #6.

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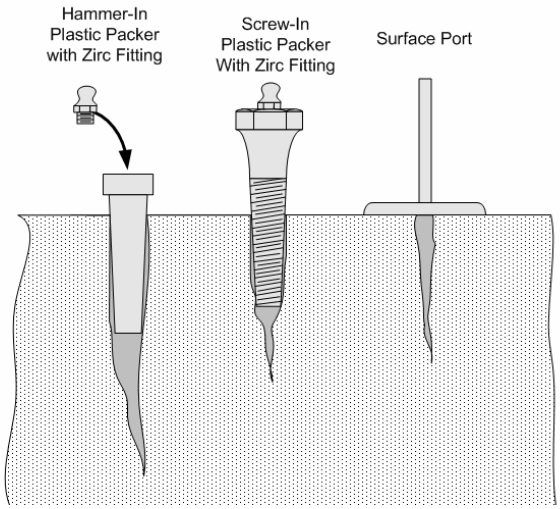
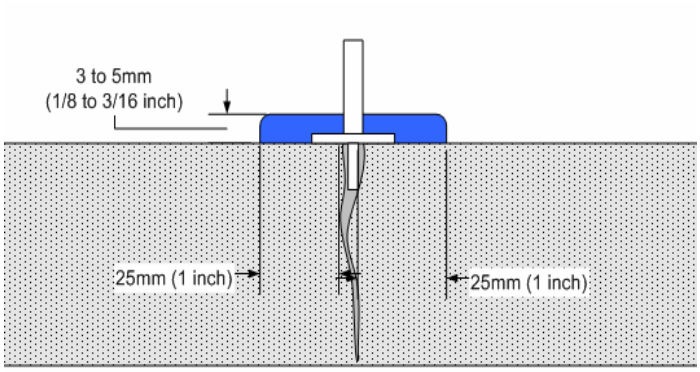
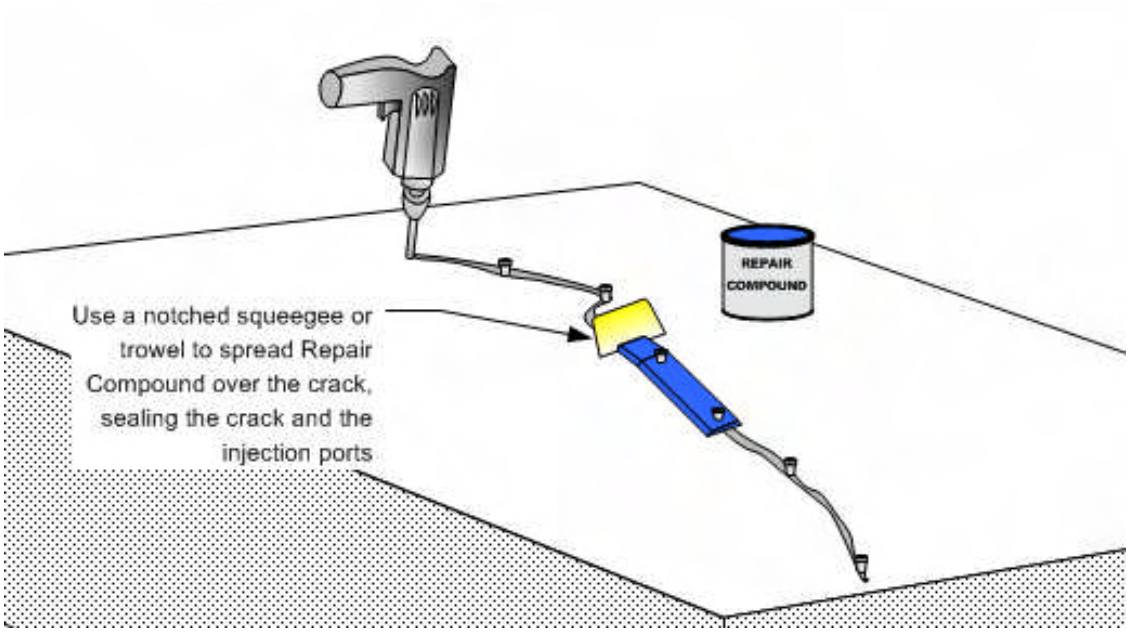




Porting Adapter Installed in a Crack



EQUIPMENT FOUNDATION SYSTEMS

Installing Expansion Joints

In CHOCKFAST & ESCOWELD Grouts

Technical Bulletin # 662D

Product Description

To maintain alignment of grouted equipment, most epoxy machinery grouts are designed to be rigid and to resist movement. As a result, stresses developed during cure and subsequent temperature changes that may result in cracking. Cracks do not usually impair the grout's ability to support the equipment but cracks are undesirable because of both their cosmetic appearance and the fact that they allow oil and water to migrate down to the concrete substrate and destroy the concrete. Expansion joints will also help reduce the possibility of cracking on long grout pours.

Locating Expansion Joints

After the concrete surface has been chipped and the forms erected, the expansion joints may be installed. Expansion joints should be located every 1m to 2m (3-ft to 7-ft), depending on the length and width of the foundation. Placement also depends on the grouting material used. When using CHOCKFAST Blue on long pours, divide the pour into sections not exceeding 3'-6" (1.1m) in length. When using CHOCKFAST Red or ESCOWELD 7505E/7530 pours should not exceed 7 ft x 7 ft (2 m long x 2 m wide). When using CHOCKFAST Blue on top of CHOCKFAST Red install the expansion joints as you would for CHOCKFAST Blue. See Technical Bulletin 642 for additional information on installing grout.

Expansion joints should be positioned so as not to interfere with soleplates, chocks or anchor bolt locations. For best results, always consult your Chockfast Grouting Systems representative or ITW Polymer Technologies about expansion joint design and location.

Install expansion joints on the concrete foundation only after the surface of the foundation is properly prepared and cleaned. As far as possible all concrete vulnerable to contact with oil or other harmful liquids should be coated with IMPAX 2001 or IMPAX 6700 prior to installing the expansion joints or pouring grout.

Construction Materials

There are a number of materials that can be used to construct an expansion joint. The primary material should be 1" to 2" (24 mm to 50 mm) thick. Redwood, Styrofoam or Ethafoam make excellent expansion joint materials. They are resistant to water and oil, and are easily compressible.

Ethafoam 220 skinless (Made by Dow Chemical) is a stiff closed-cell foam sheet. While this particular foam is recommended other rigid neoprene or urethane foam sheets may also be used. A suitable thickness is 1" (25mm). The faces of the foam sheet must be must be roughened by sanding so the epoxy will bond to it.

Styrofoam is probably the most popular as it is easily obtained, sufficiently rigid and simple to fit. Unfortunately it is not resilient or oil proof, so a method of sealing it on top and bottom must be provided.

Sealing Expansion Joints

It is very important that expansion joints are oil, chemical and water tight. For this reason, we recommend the use of both a primary and secondary seal on the expansion joint. The primary seal is located at the top of the joint and the secondary seal is located at the bottom of the joint. Removing some or all of the foam or wood and replacing it with Expansion Joint Compound creates the primary seal. All of the Styrofoam may be removed with a solvent if desired, but this is not essential. It is sufficient to remove only the top 1/2" (12mm).

A secondary seal or oil barrier is formed at the epoxy/concrete interface. This secondary seal is made from a mixture of one (1) part Expansion Joint Compound and four (4) to seven (7) parts dry blasting sand. The mixture is applied on top of the concrete 3" (75 mm) wide and 1" (25 mm) thick along the area to receive the expansion joint. The expansion joint material is then pressed into this mixture to a depth of 1/2" to 3/4" (12 mm to 18 mm). The expansion joint compound and sand must be fully cured before pouring the grout so that it can support the expansion joint.

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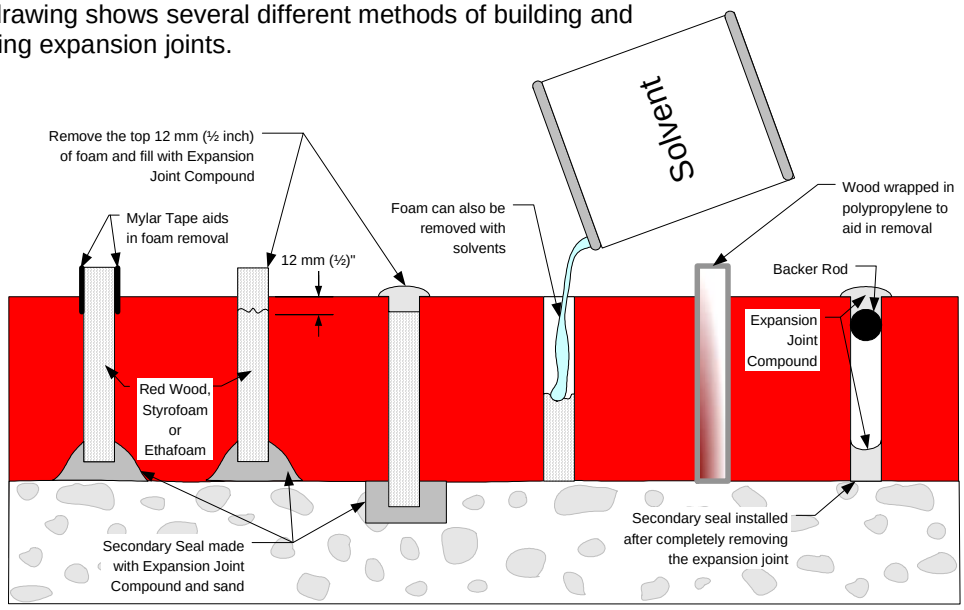
An alternate method of creating a secondary seal is to chip a 1" (25 mm) deep groove into the concrete at the expansion joint locations. This groove should be about 1" (25 mm) wider than the expansion joint material. A mixture of Expansion Joint Compound with a slight amount of sand (coarse) is poured into the groove. A light sand and compound mix is used to keep the mixture fluid yet cost effective. Once the Expansion Joint Compound is in place, the expansion joint material is pressed into it, and the Expansion Joint Compound is allowed to cure.

Construction Methods

This drawing shows several different methods of building and installing expansion joints.



Examples 1 & 2: This example shows Mylar tape placed along both sides of the top edge of the Styrofoam or Ethafoam to aid in the removal of the top 12 mm (1/2"). It also shows the Joint Compound and sand mixture applied to the foundation to form a secondary seal.

Example 3: After the top 12 mm (1/2") is removed, the groove is filled with Expansion Joint Compound. Note the secondary seal made by chipping a groove in the concrete.

Example 4: Styrofoam can also be removed by melting it with solvent. This example shows no secondary seal so one will have to be installed after the joint is completely removed.

Example 5: This example shows a piece of wood wrapped with polypropylene or duct tape so that it can easily be removed after the grout sets up. It will also require a secondary seal be installed.

Example 6: If the expansion joint material is completely removed, both a primary and a secondary seal must be installed. In this case the primary seal is made using both Backer Rod and Expansion Joint Compound. The secondary seal is made by pouring Expansion Joint Compound into the bottom of the cavity.

Date

04/2004

EQUIPMENT FOUNDATION SYSTEMS

Understanding the Physical Properties of Epoxy Grout

Technical Bulletin # 663B

Bulletin Description

This bulletin was published to help people choosing epoxy grouting materials to understand some of the terms associated with the physical properties of grout and to understand the benefits and limitations of grout testing.

General

All epoxy resin manufacturers publish figures on at least some of the physical properties of their products. Whether the figures are derived from tests performed in-house or by an independent testing laboratory, the specific value obtained for any one property has little or no value in determining the suitability of a product for a particular application. This is especially true for the various compression tests.

For example, the American Society for Testing and Materials (ASTM) states in its Standard for Compressive Properties of Rigid Plastics:

> *"Compression tests provide a standard method of obtaining data for research and development, quality control, acceptance or rejection under specifications, and special purposes. The tests cannot be considered significant for engineering design in applications differing widely from the load-time scale of the standard test."*

In other words, the tests are relevant for comparing one sample with another, but the values derived do not necessarily relate to how the material will behave in a real application. In addition, the ASTM lists 14 different values that apply to compression tests, whereas epoxy resin manufacturers only publish one or two.

Compressive Strength

The problem with compression tests is that the sample size is dependent upon the practical size of the equipment available to perform the tests. For instance, the ASTM D695 compressive test requires a specimen 1/2" square by 1" high. A typical chocking resin will show a compressive modulus of 5×10^5 psi in this test. The same resin tested as a 4" square by 1" high specimen shows a modulus of 10×10^5 psi, or twice as much for the same material, but in a different configuration. This is due to the viscoelastic behavior of the material and is a function of the ratio of the specimen's volume to its edge area, or "aspect ratio."

Creep Tests

Creep tests are even more constrained by the availability of equipment and time. Creep is defined as a permanent deformation occurring at a stress less than the yield stress, and results from plastic flow. All solid materials, even stone and glass, are susceptible to creep and it is the designer's aim to keep stress below the creep threshold. Because of the high load, long duration, and thermostatic requirements, creep tests are expensive to perform and there probably has not been a controlled test to date on a realistic epoxy grout configuration. Instead, accelerated tests are done in laboratories on small specimens that always show some creep, so it is essential to know how to interpret the results.

The only interpretation that can be made from creep tests is that one formulation is more or less creep resistant than another in that particular specimen form, keeping in mind that all materials are subject to creep. Comparison with a proven grout tested in the same manner gives further guidance, but it is possible for creep rate test results to differ by a factor of three or more, while both of the grouts still have zero creep under practical conditions.

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Designing a grout to achieve unnecessarily high creep resistance in such tests will introduce problems such as limited pour depth, high coefficient of expansion, and stress cracking. Zero creep under real conditions is the criterion; it can't be bettered.

Conclusions

Epoxy grouts and chocking materials are complex proprietary formulations. Each is a compromise of physical properties best suited for its designed application as well as other factors such as cost and availability. The degree of compromise can be reduced significantly by having a range of complementary products, like ESCOWELD 7505/7530, CHOCKFAST ORANGE®, BLACK, BLUE, RED and GRAY. Each of these products is carefully formulated and engineered for a specific purpose. All of them required several years in development to achieve the best possible compromise in physical properties and handling characteristics. Some of the many criteria that had to be considered were: high compressive strength, high creep resistance, deep pour capability, good flowability, high heat resistance, low coefficient of thermal expansion, avoidance of resin rich top surface, and uniform distribution of aggregates without settling during the cure. The end result is a precision blend of ingredients that produces a grout with the best possible combination of characteristics required for industrial machinery and equipment foundations.

ESCOWELD 7505/7530 and CHOCKFAST RED achieve these properties and characteristics without being accompanied by excessive exothermic reaction, stress, cracking and shrinkage as commonly observed with other epoxy grouting materials that may boast having one or two superior physical characteristics as determined by laboratory data.

As the ASTM states, laboratory testing of these formulations is useful for development and quality control, which are the manufacturer's concerns. The only data of practical value comes from actual field experience, and the user should rely on unbiased reports from other users and the advice of reputable manufacturers.

Date

04/2004

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST® Orange Hardener Ratio Guide

for Chocking Between Steel & Concrete

Technical Bulletin # 665B

Bulletin Description

The purpose of the hardener in every epoxy compound or coating is to cause a reaction to that will result in the hardening of the epoxy resin. This reaction usually creates heat within the epoxy that forces the molecules to cross-link and bond tightly together. Depending on the type and quantity of resin, additives and hardener used, the final epoxy product will have certain physical properties such as compressive strength, flexibility, hardness, shear strength, shock resistance, etc.

The overwhelming majority of epoxy compounds have a fixed ratio of resin to hardener that results in a product with predictable physical properties. However, rather than specify an exact amount of hardener to use with CHOCKFAST Orange, ITW Polymer Technologies asks the end user to determine the correct amount for a particular installation that will cause the compound to achieve maximum physical properties strength. The amount of hardener is determined based on the temperature of the steel of the surrounding chock and the thickness of the chock.

By varying the amount of hardener used, the reaction that takes place between the resin and the hardener can be managed. The goal is to achieve a relatively high exothermic heat within the CHOCKFAST without causing it to either boil or crack. It is this high heat that gives CHOCKFAST Orange its exceptional strength characteristics.

Using CHOCKFAST Orange between steel and concrete or steel and epoxy is different that using it between two pieces of steel. Steel has a much greater ability to absorb heat from the CHOCKFAST during the curing process. For this reason, slightly less hardener is used when pouring CHOCKFAST on top of concrete or another epoxy.

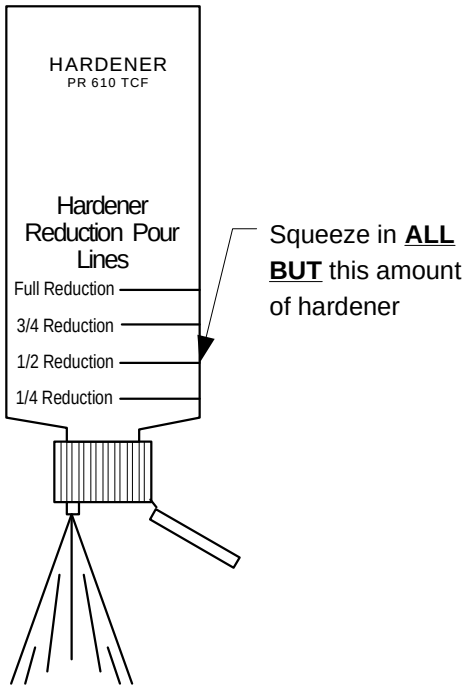
Application Instructions

Note that before mixing the resin and hardener that the resin temperature should be in the range 68º-77ºF (20º to 25ºC).

The maximum amount of hardener possible should normally be used. The graph on the following page is for guidance and the optimum amount will usually be slightly more than it shows.

After puncturing the metal foil seal, the hardener bottle is inverted and squeezed to discharge the hardener into the resin container. The hardener reduction lines are to be read with the bottle inverted as shown.

Dispose of excess hardener in an approved manner and do not collect the remainder of several bottles in one bottle as it may be mistaken for a complete hardener unit. It is usually best to mix left over hardener in the empty cans of CHOCKFAST. The hardener will combine with the left over resin and become inert.



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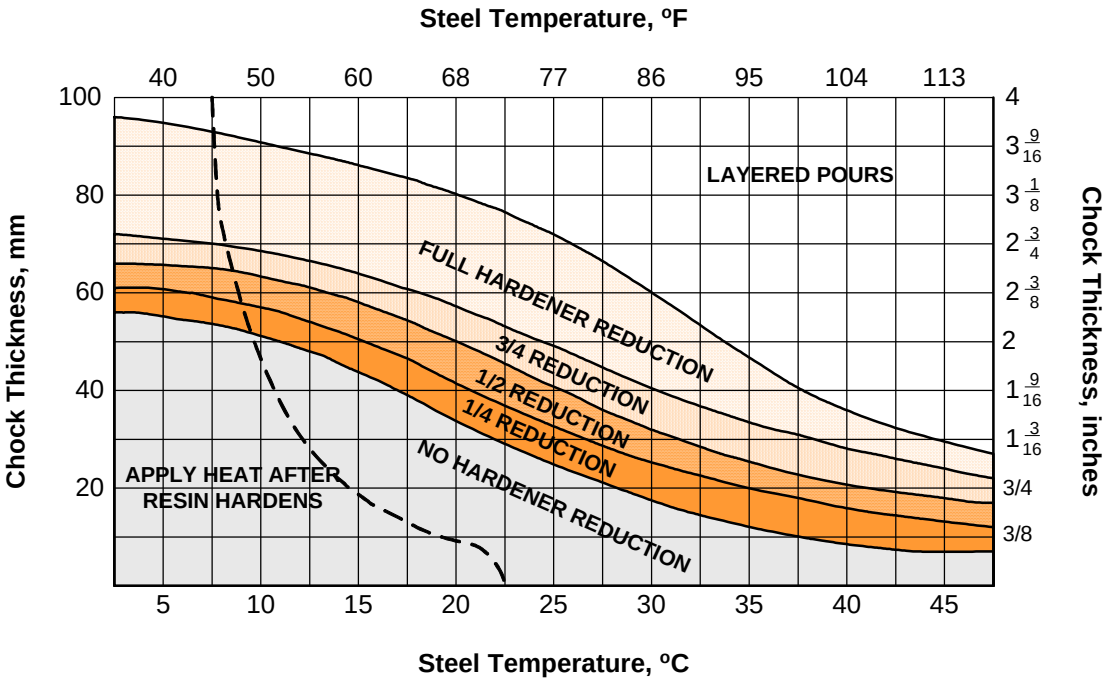
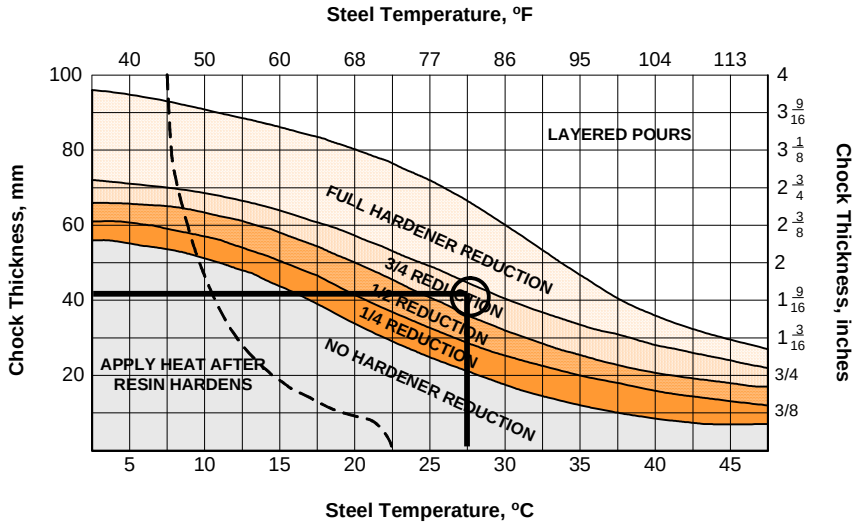


Example:

40 mm (1-9/16”) chocks with a steel temperature of 27º C (80º F) requires a ¾ Hardener Reduction



EQUIPMENT FOUNDATION SYSTEMS

Chockfast

Effect of Chock Design

On Foundation Operating Temperatures

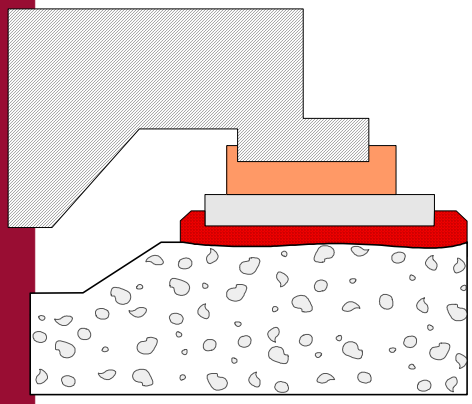
Technical Bulletin # 667A

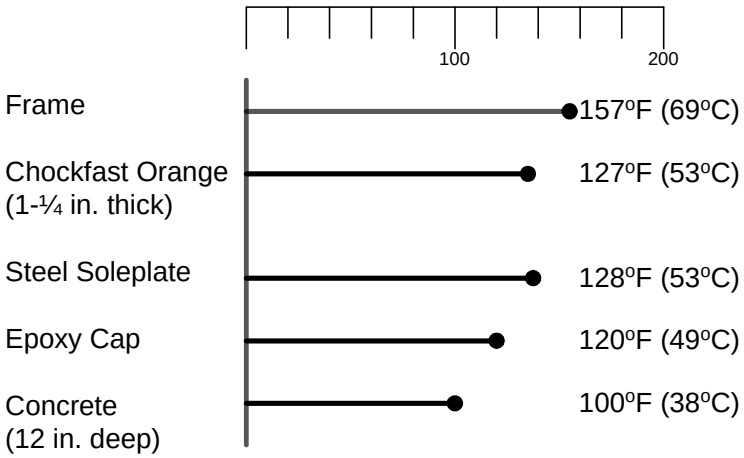
Bulletin Description

The illustrations below list the various temperature readings monitored on two different foundation designs supporting Ingersoll-Rand KVSR gas engine compressors. Both engines were operating at the maximum RPM with a 175°F oil temperature. The compressor building ambient temperature was 75°F.

Temperatures With Resin Chocks on Steel Soleplates

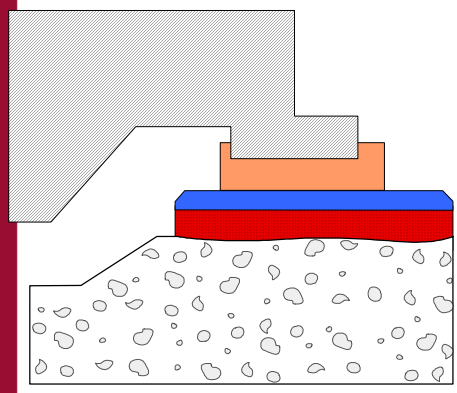
The first drawing shows the temperature variation from the engine down into the concrete foundation when the engine is mounted on 1-1/4" CHOCKFAST ORANGE® chocks on steel soleplates set in an epoxy capping material.

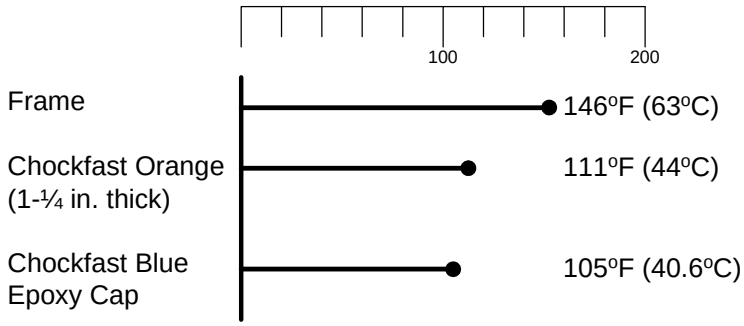




Temperatures With Resin Chocks on an Epoxy Cap

This drawing depicts the temperature variation from the engine down into the concrete foundation when the engine is mounted on 1-1/4" CHOCKFAST ORANGE® chocks on the CHOCKFAST BLUE® epoxy cap.





The foundation design with the steel soleplates indicates a higher temperature at the epoxy chock, epoxy capping material and the underlying concrete foundation. When comparing the two drawings it is quite evident that the steel soleplate contributes significantly to the excess heat build-up in the entire foundation.. The average temperature decrease in the design WITHOUT the steel soleplate is approximately 15°F at all locations of the foundation.

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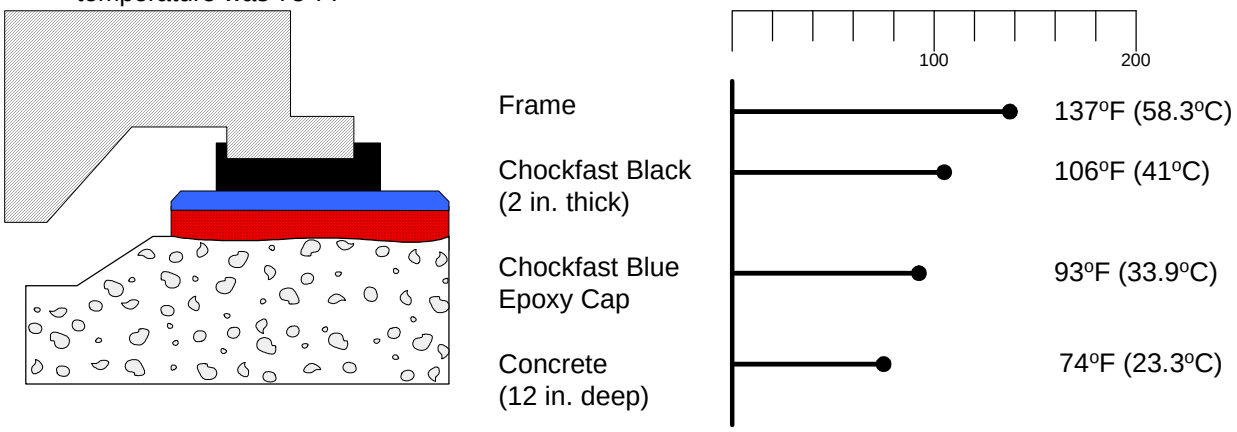
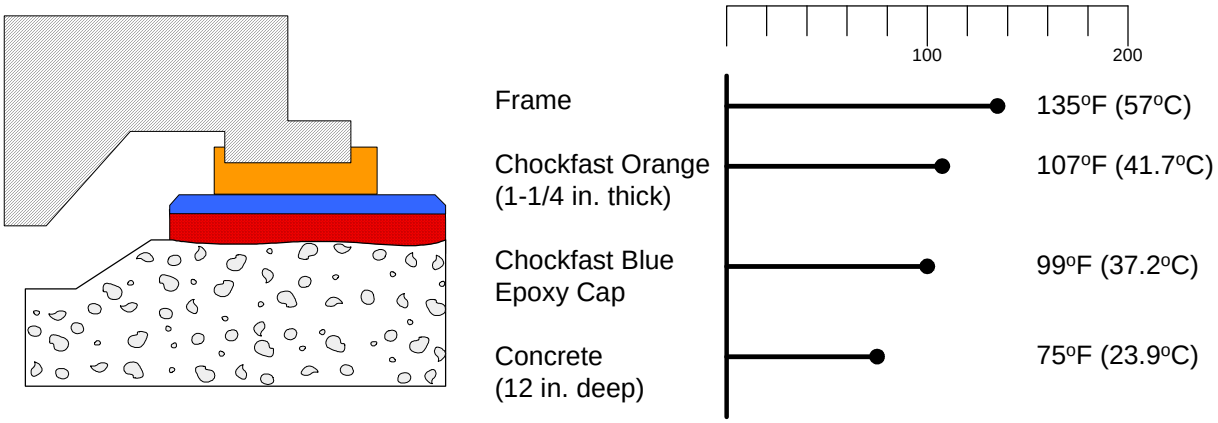
Effect of *Chock Height* on Operating Temperature

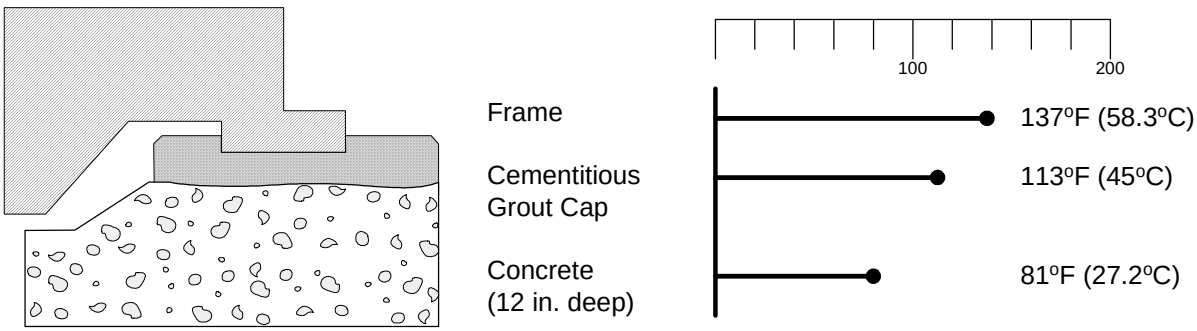
The illustrations below show the temperatures variations at different levels monitored on three different foundation designs supporting Dresser Clark HBA-8 gas engine compressors. All three engines were operating at the maximum RPM with an oil temperature of 170°F. The compressor building ambient temperature was 73°F.



The top drawing shows a 2" CHOCKFAST BLACK® epoxy chock on the CHOCKFAST BLUE® epoxy capping material while the lower drawing depicts a 1-1/4" CHOCKFAST ORANGE® epoxy chock on a cap of CHOCKFAST BLUE®.



The temperature readings in the top drawing demonstrate the added cooling effect the 2" CHOCKFAST BLACK® chocks have on the underlying epoxy cap of CHOCKFAST BLUE® which was used in both foundation designs. The CHOCKFAST BLUE® under the 2" CHOCKFAST BLACK® chocks is 6°F cooler due to the additional ¾" of air space.



The final drawing shows a full bed cementitious grout design. The cementitious grout cap is 20°F warmer than the CHOCKFAST BLUE® cap under the 2" CHOCKFAST BLACK® chocks and 14°F warmer than the CHOCKFAST BLUE® cap under the 1-1/4" CHOCKFAST ORANGE® chocks. The lack of air flow has a definite effect on the temperature of the grout cap and the underlying foundation.

Date 08/2006

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EQUIPMENT FOUNDATION SYSTEMS

Expansion Joint Compound

Estimating Formula & Chart

Technical Bulletin # 672B

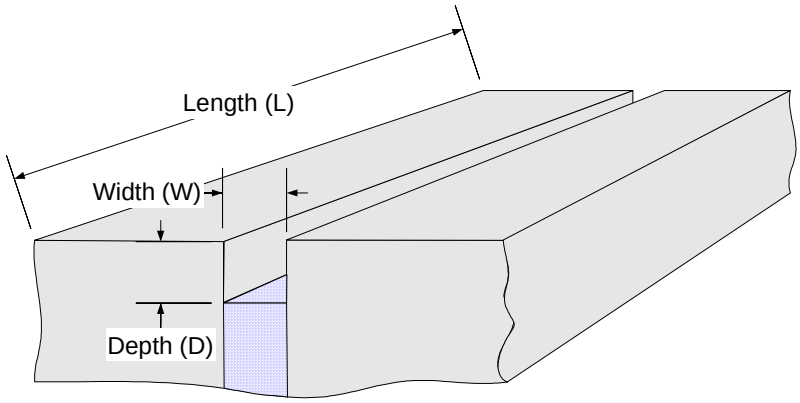
Bulletin Description

This bulletin provides a quick method for estimating the amount of Expansion Joint Compound required based on the size of the expansion joint to be filled.

Estimating Formula

A mixed unit of EXPANSION JOINT COMPOUND yields 168 cu.in.

$$\text{Number of Units Required} = \frac{\text{W-inches x D-inches x L-feet x 12 inches/foot}}{\text{168 inches}^3\text{ / unit}}$$



Joint Size	Cu. in./10 ft.	Cu. in/100 ft.	Units/100 ft.*
½" x 1"	60	600	3.6
¾" x 1"	90	900	5.4
1" x 1"	120	1,200	7.2

* This is a theoretical, no loss figure. When estimating, a 20% overage factor should be entered.

Reference

For design considerations and application details please request Bulletin No. 662, for iformation on the epoxy please request Bulletin 1018 or contact ITW Polymer Technologies' Engineering Services Department.

Date

08/2005

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EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Industrial Products

Chemical Resistance Chart

Technical Bulletin # 675F

Bulletin Description

This Bulletin shows the relative Chemical Resistance of ITW Polymer Technologies' Industrial products. The level resistance to an individual chemical is indicated by one of the following three letters:

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT

S – RESISTANT TO SPLASH AND SPILLAGE ONLY

N – NOT RECOMMENDED

NOTE: "ALL CF/ES PROD." means all products with the *CHOCKFAST* name such as Chockfast Red, Chockfast Orange, Chockfast Black, etc. or the name ESCOWELD such as Escoweld 6505E/7530

Chemical Resistance

	ALL CF/ES PROD.	REPAIR COMPOUND	5020 FLOOR RESURFACER	WEAREX ARC	#6/#8	650	2001 SERIES	6700
ACETALDEHYDE CONC.	S	S	S	S	S	S	S	S
ACETIC ACID - UP TO 12%	R	R	R	R	R	R	S	S
ACETIC ACID - 12 TO 20%	S	S	S	S	S	S	N	S
ACETIC ACID - OVER 20%	N	N	S	N	N	N	N	N
ACETONE - 100%	N	N	S	N	N	N	S	R
ACIDS, DILUTE INORGANIC	R	R	R	R	R	R	R	R
ACIDS, CONCENTRATED	N	N	S	N	N	N	N	S
ACRYLIC ACID	N	N	S	N	N	N	N	N
AIR	R	R	R	R	R	R	R	R
ALCOHOLS	R	R	R	R	R	R	R	R
ALDEHYDES	S	S	S	S	S	S	S	S
ALLYL CHLORIDE	S	S	S	S	S	S	S	S
ALUM, AMMONIUM	R	R	R	R	R	R	R	R
ALLUMINUM CHLORIDE	R	R	R	R	R	R	R	R
ALUMINUM SULFATE	R	R	R	R	R	R	R	R
ALUMINUM POTASSIUM SULFATE	R	R	R	R	R	R	R	R
ALIPHATIC HYDROCARBONS	R	S	R	S	R	R	R	R
AMMONIA, 10%	R	R	R	R	R	R	R	R
AMMONIA, 25%	N	N	S	N	N	N	N	N
AMMONIUM CHLORIDE	S	S	S	S	S	S	S	R
AMMONIUM BICARBONATE	R	R	R	R	R	R	R	R
AMMONIUM BIFLUORIDE	S	S	S	S	S	S	S	R
AMMONIUM NITRATE	S	S	S	S	S	S	S	R
AMMONIUM PHOSPHATE	S	S	S	S	S	S	R	R
AMMONIUM SULFATE	S	S	S	S	S	S	R	R
AMYL ACETATE	R	S	R	S	S	S	S	R
AMYL ALCOHOL	R	R	R	R	R	R	R	R
AMYL CHLORIDE	S	S	S	S	S	S	S	R
ANILINE	N	N	N	N	N	N	N	N
ANTIMONY CHLORIDE, TRI-	R	R	R	R	R	R	R	R
AROMATIC HYDROCARBONS	R	S	R	S	R	N	R	R

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	ALL CF/ES PROD.	REPAIR COMPOUND	FLOOR RESURFACER	WEAREX ARC	#6/#8	650	2001 SERIES	6700
BEER	S	S	R	S	S	S	R	R
BENZELDEHYDE	N	N	N	N	N	N	N	R
BENZENE	N	N	S	N	N	N	N	R
BENZENE HEXACHLORIDE	R	R	R	R	R	R	R	R
BENZENE SULFONIC ACID	S	S	S	S	S	N	S	R
BLACK LIQUOR	R	R	R	R	R	R	R	R
BLEACH LIQUOR	S	S	R	S	S	S	S	N
BORIC ACID	R	R	R	R	R	R	R	R
BROMINE WATER	S	S	S	S	S	S	S	S
BUTYL ACETATE	S	S	R	S	S	S	R	R
BUTYL ALCOHOL (BUTANOL)	R	R	R	R	R	R	R	R
BUTYL CELLOSOLVE	R	R	R	R	R	R	R	R
BUTYRIC ACID	R	R	R	R	R	S	R	R
CALCIUM CHLORATE	S	S	R	S	S	S	S	S
CALCIUM CHLORIDE	R	R	R	R	R	R	R	R
CALCIUM HYDROXIDE	R	R	R	S	R	S	R	R
CALCIUM HYPOCHLORITE	S	S	R	S	S	S	S	N
CARBON BISULFIDE	S	S	R	S	S	S	S	S
CARBON TETRACHLORIDE	S	S	S	S	S	S	S	S
CAUSTIC SODA	R	R	R	R	R	R	R	R
CAUSTIC POTASH	R	R	R	S	R	S	R	R
CHLORINATED SOLVENTS	S	S	S	S	S	S	S	S
CHLORINE SOLUTION	S	S	S	S	S	S	S	N
CHLORINE GAS R	R	R	R	R	R	R	N	/A
CHLOROBENZENE	N	N	S	N	N	N	N	S
CHLOROSULFONIC ACID, DILUTE	R	R	R	R	R	S	R	R
CHROMIC ACID - UP TO 20%	R	R	R	R	R	R	R	R
CHROMIC ACID - OVER 20%	N	N	N	N	N	N	N	N
CITRIC ACID 50%	S	S	S	S	S	S	R	R
CITRIC ACID, DILUTE 20%	R	R	R	R	R	R	R	R
COPPER CHLORIDE	R	R	R	R	R	R	R	R
COPPER SULFATE	R	R	R	S	R	R	R	R
CRUDE OIL, SWEET/SOUR	R	R	R	R	R	R	R	R
CYCLOHEXANOL 100%	R	R	R	R	R	R	R	R
CYCLOHEXANONE 100%	N	N	S	N	N	N	R	S
DETERGENTS	R	R	R	S	R	R	R	R
DIBUTYL PHTHALATE	S	S	S	S	S	S	S	R
DIETHYL ETHER	R	S	R	S	R	R	S	R
DIETHYLENETRIAMINE 10%	N	N	S	N	N	N	N	S
DIMETHYL PHTHALATE	S	S	S	S	S	S	S	R
DIOXANE	N	N	N	N	N	N	N	S
ETHERS	S	S	R	S	S	S	S	R
ETHYL ALCOHOL 96% (192 PROOF ETHANOL)	S	N	S	N	S	S	R	R
ETHYL BENZENE	N	N	R	N	N	N	R	R
ETHYLENEDIAMINE	N	N	N	N	N	N	N	S

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

	ALL CF/ES PROD.	REPAIR COMPOUND	FLOOR RESURFACER	WEAREX ARC	#6/#8	650	2001 SERIES	6700
ETHYLENE DICHLORIDE	S	S	S	S	S	N	S	S
ETHYLENE GLYCOL	R	R	R	R	R	R	R	R
FATTY ACIDS	R	N	R	N	R	R	R	R
FERRIC CHLORIDE	R	S	R	S	R	R	R	R
FERRIC NITRATE	S	S	S	S	S	S	R	R
FERRIC SULFATE	R	R	R	R	R	R	R	R
FORMALDEHYDE, 10%	R	R	R	R	R	R	R	R
FORMIC ACID	N	N	S	N	N	N	N	N
GASOLINE, REGULAR	R	R	R	R	R	R	R	R
GASOLINE, AVIATION	R	R	R	R	R	R	R	R
GLYCERIN (GLYCEROL)	R	R	R	S	S	R	R	R
HEXANE	R	R	R	R	R	R	R	R
HEXYLENE GLYCOL	R	R	R	R	R	R	R	R
HYDROBROMIC ACID	S	S	S	S	S	S	S	S
HYDROCHLORIC ACID, 20%	R	S	R	S	R	S	S	R
HYDROCHLORIC, CONCENTRATED	S	S	S	S	S	N	S	N
HYDROCYANIC ACID	S	S	S	S	S	S	S	S
HYDROFLUORIC ACID	S	N	S	N	S	N	N	N
HYDROGEN PEROXIDE, DILUTE	S	S	S	S	S	S	S	S
HYDROGEN SULFIDE	S	S	S	S	S	S	R	R
HYPO SOLUTION	R	R	R	R	R	R	R	R
HYPOCHLOROUS ACID	S	S	S	S	S	N	S	S
IODINE	S	S	S	S	S	N	S	S
JET FUEL	R	R	R	R	R	R	R	R
KEROSENE	R	R	R	R	R	R	R	R
KETONES	S	S	R	S	S	R	R	R
KRAFT COOKING OIL, ACID	R	R	R	R	R	R	R	R
KRAFT COOKING OIL, 250°. F	S	S	S	S	S	N	S	R
LACTIC ACID (DILUTE)	R	R	R	R	R	S	R	R
LINSEED OIL	R	R	R	R	R	R	R	R
MAGNESIUM CHLORIDE	R	R	R	R	R	R	R	R
MAGNESIUM SULFATE	R	R	R	R	R	R	R	R
MALEIC ANHYDRIDE	S	S	S	S	S	S	S	R
MERCURIC CHLORIDE	S	S	S	S	S	S	S	R
MERCUROUS NITRATE	S	S	S	S	S	S	R	S
METHYL ALCOHOL (METHANOL)	S	S	S	S	S	S	S	N
METHYLENE DICHLORIDE	N	N	N	N	N	N	N	N
METHYL ETHYL KETONE	S	S	S	S	S	N	S	R
MILK	R	R	R	R	R	R	R	R

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

	ALL CF/ES PROD.	REPAIR COMPOUND	5020 FLOOR RESURFACER	WEAREX ARC	#6/#8	650	2001 SERIES	6700
MINERAL OIL	R	R	R	R	R	R	R	R
MOLASSES	R	R	R	R	R	R	R	R
MOTOR OIL	R	R	R	R	R	R	R	R
NAPTHA	R	R	R	R	R	R	R	R
NICKEL CHLORIDE	R	R	R	R	R	R	R	R
NICKEL SULFATE	R	R	R	R	R	R	R	R
NITRIC ACID - 10%	R	R	R	R	R	S	S	S
NITRIC ACID, CONCENTRATED	N	N	N	N	N	N	N	N
NITROBENZENE 100%	N	N	N	N	N	N	N	S
OLEIC ACID	S	S	S	S	S	S	R	R
OXALIC ACID	S	S	S	S	S	S	S	R
OXYGEN	R	R	R	R	R	R	R	N
PHENOL	N	N	N	N	N	N	N	N
PHOSPHORIC ACID, DIL.	R	R	R	R	R	R	R	R
PLATING SOLUTIONS	S	S	S	S	S	S	N	S
POTASSIUM CARBONATE	R	R	R	R	R	R	R	R
POTASSIUM CHLORIDE	R	R	R	R	R	R	R	R
POTASSIUM DICROMATE	S	S	S	S	S	S	R	R
POTASSIUM HYDROXIDE 40%	S	S	S	S	S	S	R	R
POTASSIUM NITRATE	S	S	S	S	S	S	R	R
SEA WATER	R	R	R	R	R	R	R	R
SOAP SOLUTION	R	R	R	R	R	R	R	R
SODIUM BISULFATE	R	R	R	R	R	R	R	R
SODIUM BICHROMATE SOL. 66g/100	R	R	R	R	R	R	R	R
SODIUM CARBONATE	R	R	R	R	R	R	R	R
SODIUM CHLORIDE	R	R	R	R	R	R	R	R
SODIUM CHLORITE 10g/100	S	S	S	S	S	S	R	R
SODIUM HYDROXIDE, 50%	S	S	R	S	S	S	R	R
SODIUM HYPOCHLORITE	S	S	S	S	S	S	S	S
SODIUM METHOXIDE	S	S	S	S	S	S	S	S
SODIUM NITRATE	S	S	S	S	S	S	R	N
SODIUM PHOSPHATE, TRI	R	S	R	S	R	S	R	N
SODIUM SULFATE	R	R	R	R	R	R	R	N
SODIUM THIOSULFATE	S	S	S	S	S	S	R	N
STEARIC ACID	R	R	R	R	R	R	R	N
STANNIC CHLORIDE	R	R	R	R	R	R	R	N
STYRENE	N	N	N	N	N	N	R	R
SUGAR	R	R	R	R	R	R	R	R
SULFAMIC ACID	R	R	R	R	R	S	R	R
SULFUR DIOXIDE	R	R	R	R	R	R	R	R
SULFURIC ACID, 20%	R	S	R	S	R	S	S	R
SULFURIC ACID, 50%	S	S	S	S	S	N	S	R
SULFURIC ACID, 95%	N	N	N	N	N	N	N	R

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	ALL CF/ES PROD.	REPAIR COMPOUND	5020 FLOOR RESURFACER	WEAREX ARC	#6/#8	650	2001 SERIES	6700
TANNIC ACID	S	S	S	S	S	S	R	R
TARTARIC ACID	R	R	R	R	R	R	R	R
TETRACHLOROETHANE	N	N	N	N	N	N	R	S
TETRAETHYLENE PENTAMINE	R	R	R	R	R	S	R	S
TOLUENE SULFONIC ACID	S	S	S	S	S	N	S	R
TOLUENE	N	N	N	N	N	N	R	R
TRICHLOROACETIC ACID	N	N	S	N	N	N	N	N
TRICHLOROETHYLENE	N	N	N	N	N	N	R	S
TRISODIUM PHOSPHATE	R	R	R	R	R	R	R	R
TURPENTINE	N	N	N	N	N	N	S	R
UREA	R	S	R	S	R	S	S	R
URINE	R	R	R	R	R	R	R	R
VINEGAR	R	S	R	S	R	S	S	R
WATER, ACID, HOT, STEAM	S	N	S	S	S	N	N	S
WATER, BOILING	S	N	S	S	S	S	N	S
WAX EMULSION	R	R	R	R	R	R	R	R
WINE	R	S	R	S	R	R	R	R
XYLENE	R	S	R	S	R	R	R	R
ZINC CHLORIDE	S	S	S	S	S	S	R	R
ZINC SULFATE	S	S	S	S	S	S	R	R

Date 08/2005

General: Every reasonable effort is made to insure the technical information and recommendations on these data pages are true and accurate to the best of our knowledge at the date of issuance. However, this information is subject to change without notice. Prior versions of this publication are invalid with the release of this version. Products and information are intended for use by qualified applicators that have the required background, technical knowledge, and equipment to perform said tasks in a satisfactory manner. Consult your local distributor for product availability, additional product information, and technical support.
Warranty: ITW Polymer Technologies, a division of Illinois Tool Works Inc., warrants that its products meet their printed specifications. This is the sole warranty. This warranty expires one year after product shipment.
Warranty Claims: If any product fails to meet the above, ITW Polymer Technologies will, at its option, either replace the product or refund the purchase price. ITW Polymer Technologies will have no other liability for breach of warranty, negligence, or otherwise. All warranty claims must be made in writing within one year of the date of shipment. No other claims will be considered.
Disclaimer: ITW Polymer Technologies makes no other warranty, expressed or implied, and specifically disclaims any warranty of merchantability or fitness for a particular purpose.

Suggestions concerning the use of products are not warranties. The purchaser assumes the responsibility for determining suitability of products and appropriate use. ITW Polymer Technologies' sole liability, for breach of warranty, negligence or otherwise, shall be the replacement of product or refund of the purchase price, at ITW Polymer Technologies' election. Under no circumstances shall ITW Polymer Technologies be liable for any indirect, incidental or consequential damages.
Modification of Warranty: No distributor or sales representative has the authority to change the above provisions. No change in the above provisions will be valid unless in writing and signed by an officer or the Technical Director of ITW Polymer Technologies. No term of any purchase order shall serve to modify any provision of this document.
Mediation and Arbitration: If any dispute arises relating to products or product warranties, either the purchaser or ITW Polymer Technologies may a) initiate mediation under the then current Center for Public Resources (CPR) Model Procedure for Mediation of Business Disputes, or b) initiate a non-binding arbitration under the rules of the American Arbitration Association for the resolution of commercial disputes.

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S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

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REPAIR PRODUCTS

ITW Polymer Technologies Chemical Resistance Chart

Technical Bulletin # 678A

Super Alloy Repair Products

Bulletin Description

This Bulletin shows the relative Chemical Resistance of ITW Polymer Technologies' Super Alloy Repair Products. The level resistance to an individual chemical is indicated by one of the following three letters:

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT

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N – NOT RECOMMENDED

Chemical Resistance

	SUPER ALLOY Titanium Putty	SUPER CERAMIC Repair Putty	SUPER CERAMIC Repair Liquid
Acetaldehyde Conc.	S	S	S
Acetic Acid - up to 12%	R	R	R
Acetic Acid - 12 to 20%	S	S	S
Acetic Acid - Over 20%	N	N	N
Acetone - 100%	N	N	N
Acids, Dilute Inorganic	R	R	R
Acrylic Acid	N	N	N
Aldehydes	S	S	S
Allyl Chloride	S	S	S
Alum, Ammonium	R	R	R
Aluminum Chloride	R	R	R
Aluminum Sulfate	R	R	R
Aluminum Potassium Sulfate	R	R	R
Aliphatic Hydrocarbons	R	R	R
Ammonia, 10%	R	R	R
Ammonia, 25%	N	N	N
Ammonium Chloride	S	S	S
Ammonium Bicarbonate	R	R	R
Ammonium Bifluoride	R	R	R
Ammonium Nitrate	S	S	S
Ammonium Phosphate	S	S	S
Ammonium Sulfate	S	S	S
Amyl Acetate	S	S	S
Amyl Alcohol	R	R	R
Amyl Chloride	S	S	S
Antimony Chloride, Tri-	R	R	R
Aromatic Hydrocarbons	R	R	R
Aniline	N	N	N
Beer	S	S	S
Benzeldehyde	N	N	N
Benzene	N	N	N
Benzene Hexachloride	R	R	R
Benzene Sulfonic Acid	S	S	S
Bleach Liquor	S	S	S
Boric Acid	R	R	R
Bromine Water	S	S	S
Butyl Acetate	S	S	S
Butyl Alcohol	R	R	R

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	SUPER ALLOY Titanium Putty	SUPER CERAMIC Repair Putty	SUPER CERAMIC Repair Liquid
Butyl Cellosolve	R	R	R
Butyric Acid (Dilute)	R	R	R
Calcium Chlorate	S	S	S
Calcium Chloride	S	S	S
Calcium Hydroxide	S	S	S
Calcium Hypochlorite	S	S	S
Carbon Bisulfide	S	S	S
Carbon Tetrachloride	N	N	N
Caustic Soda	R	R	R
Caustic Potash	R	R	R
Chlorinated Solvents	S	S	S
Chlorine Solution	R	R	R
Chlorine Gas	R	R	R
Chlorobenzene	N	N	N
Chlorosulfonic Acid, Dilute	R	R	R
Chromic Acid - up to 20%	R	R	R
Chromic Acid - over 20%	N	N	N
Citric Acid, 50%	S	S	S
Citric Acid, Dilute 20%	R	R	R
Copper Chloride	R	R	R
Copper Sulfate	S	S	S
Cyclohexanol 100%	R	R	R
Cyclohexanone 100%	N	N	N
Detergents	S	S	S
Dibutyl Phthalate	S	S	S
Diethyl Ether	R	R	R
Diethylenetriamine 10%	S	S	S
Dimethyl Phthalate	S	S	S
Dioxane	N	N	N
Ethers	S	S	S
Ethyl Alcohol 96% (192 Proof)	R	R	R
Ethylenediamine	N	N	N
Ethylene Dichloride	S	S	S
Ethylene Glycol	R	R	R
Fatty Acids	S	R	R
Ferric Chloride	R	R	R
Ferric Nitrate	S	S	S
Ferric Sulfate	R	R	R
Formaldehyde, 10%	R	R	R
Formaldehyde, 37%	S	S	S
Formic Acid	N	N	N
Gasoline, Regular	R	R	R
Gasoline, Aviation	R	R	R
Glycerin	R	R	R
Glycerol	S	S	S
Hydrobromic Acid	S	S	S
Hydrochloric Acid, 20%	R	R	R
Hydrochloric, Concentrated	S	S	S
Hydrocyanic Acid	S	S	S

R - Resistant to Immersion or Prolonged Contact
S - Resistant to Splash and Spillage Only
N - Not Recommended

	SUPER ALLOY Titanium Putty	SUPER CERAMIC Repair Putty	SUPER CERAMIC Repair Liquid
Hydrofluoric Acid	N	N	N
Hydrogen Peroxide, Dilute	S	S	S
Hydrogen Sulfide	R	R	R
Hypo Solution	R	R	R
Hypochlorous Acid	S	S	S
Hexylene Glycol	R	R	R
Iodine	S	S	S
Kerosene	R	R	R
Ketones	S	S	S
Kraft Cooking Oil, Acid	R	R	R
Kraft Cooking Oil, 250°F	S	S	S
Lactic Acid (Dilute)	R	R	R
Linseed Oil	S	S	S
Magnesium Chloride	S	S	S
Magnesium Sulfate	S	S	S
Maleic Anhydride	S	S	S
Mercuric Chloride	S	S	S
Mercurous Nitrate	S	S	S
Methyl Alcohol	S	S	S
Methylene Dichloride	N	N	N
Methyl Ethyl Ketone	S	S	S
Milk	R	R	R
Mineral Oil	R	R	R
Molasses	R	R	R
Motor Oil	R	R	R
Nickel Chloride	R	R	R
Nickel Sulfate	R	R	R
Nitric Acid - 10%	S	S	S
Nitric Acid, Concentrated	N	N	N
Nitrobenzene 100%	N	N	N
Oleic Acid	S	S	S
Oxalic Acid	S	S	S
Oxygen	R	R	R
Phenol	N	N	N
Phosphoric Acid, Dil. 20%	R	R	R
Plating Solutions	S	S	S
Potassium Carbonate	S	S	S
Potassium Chloride	S	S	S
Potassium Dicromate	S	S	S
Potassium Hydroxide 40%	S	S	S
Potassium Nitrate	R	R	R
Sea Water	R	R	R
Soap Solution	R	R	R
Sodium Bisulfate	S	S	S
Sodium Bichromate Sol. 66g/10	R	R	R
Sodium Carbonate	R	R	R
Sodium Chloride	S	S	S

R - Resistant to Immersion or Prolonged Contact
S - Resistant to Splash and Spillage Only
N - Not Recommended

	SUPER ALLOY Titanium Putty	SUPER CERAMIC Repair Putty	SUPER CERAMIC Repair Liquid
Sodium Chlorite 10g/100	R	R	R
Sodium Hydroxide, 50%	R	R	R
Sodium Hypochlorite	S	R	R
Sodium Methoxide	S	S	S
Sodium Nitrate	R	R	R
Sodium Phosphate, Tri - 5%	R	R	R
Sodium Sulfate 5%	R	R	R
Sodium Trisulfate	S	S	S
Stearic Acid	R	R	R
Stannic Chloride	R	R	R
Styrene	N	N	N
Sugar	R	R	R
Sulfamic Acid	R	R	R
Sulfur Dioxide	R	R	R
Sulfuric Acid, 20%	R	R	R
Sulfuric Acid, 50%	S	S	S
Sulfuric Acid, 95%	N	N	N
Tannic Acid	S	S	S
Tartaric Acid	R	R	R
Tetrachloroethane	N	N	N
Tetroethylene Pentamine	R	R	R
Toluene Sulfonic Acid	S	S	S
Toluene	N	N	N
Trichloroacetic Acid	N	N	N
Trichlorethylene	N	N	N
Trisodium Phosphate, 15%	R	R	R
Turpentine	N	N	N
Urea	R	R	R
Urine	R	R	R
Vinegar	R	R	R
Water, Boiling Steam	S	S	S
Wax Emulsion	R	R	R
Wine	R	R	R
Zinc Chloride	S	S	S
Zinc Sulfate	S	S	S

Date 10/2005

R - Resistant to Immersion or Prolonged Contact
S - Resistant to Splash and Spillage Only
N - Not Recommended

EQUIPMENT FOUNDATION SYSTEMS

Calculating Anchor Bolt Pullout Strength

Technical Bulletin # 691B

Bulletin Description

Anchor bolt Pull Out Strength is the force required to pull a single bolt out of its foundation. The separation can occur between the epoxy grout and the concrete foundation or it can occur between the anchor bolt and the epoxy grout itself. This bulletin provides the formulas needed to calculate the force required to pull an anchor bolt out in either manner.

To calculate the Total Pull Out Strength of the entire machine, multiply the force required to pull one bolt out times the total number of bolts.

When calculating Pull Out Strength it is assumed that:

1. A clean, threaded rod or bolt with a coarse surface profile is used.
2. A nut and washer are installed at the bottom of the rod to act as a mechanical interference.
3. The anchor bolt hole is clean and dry, with no contaminants.

Bond Strength Epoxy to Concrete

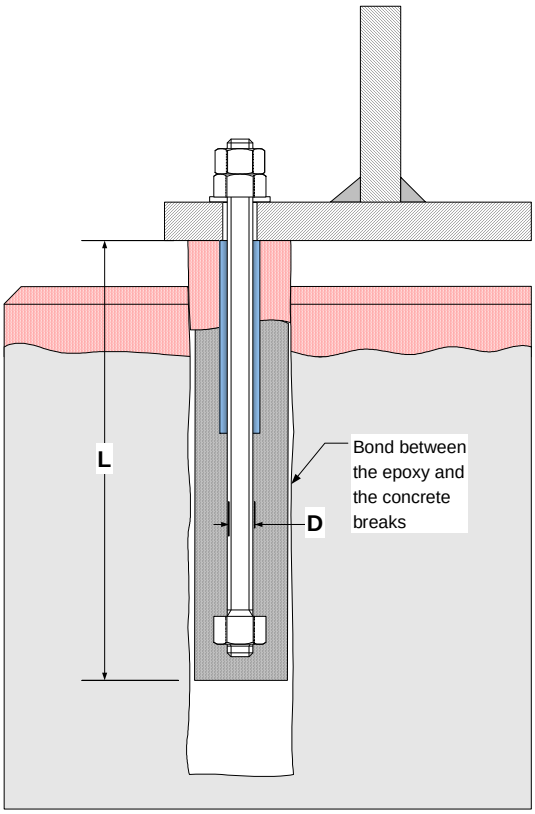
The bond of the epoxy grout to the concrete foundation is stronger than the bond of the concrete to itself. Typically, concrete will separate next to the bond line of the epoxy and concrete. Therefore, the weakest link in the bond of epoxy to concrete is the concrete itself. The force required to pull concrete apart is called its *Shear Strength*. A conservative value for concrete shear strength is 800 psi. To determine the force required to pullout the bolt separating it at the epoxy to concrete bond, use the following calculation:

$$\text{Force} = D \times \pi \times L \times 800 \text{ psi}$$

Where:
F = Bolt Pullout Force in lbs.
D = Grout Hole Diameter in inches
L = Length in inches of the grout hole

π = 3.1415

Below are examples of the force required to pull out various size bolts out of various size holes.



PULL OUT STRENGTH IN POUNDS				
	BOLT LENGTH			
HOLE DIAMETER	3”	4”	5”	10”
5/8"	4,710	6,280	7,850	15,700
3/4"	5,650	7,530	9,420	18,840
1"	7,530	10,050	12,560	25,130
1.5"	11,309	15,070	18,840	37,690
2.0”	15,070	20,100	25,130	50,260

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Bond Strength Epoxy to Steel

The bond of grout to the steel anchor bolt can be calculated using 1600 psi as the Bond Strength of epoxy to steel. This too is also a conservative number. To determine the force at the grout-to-bolt interface, use the following calculation:

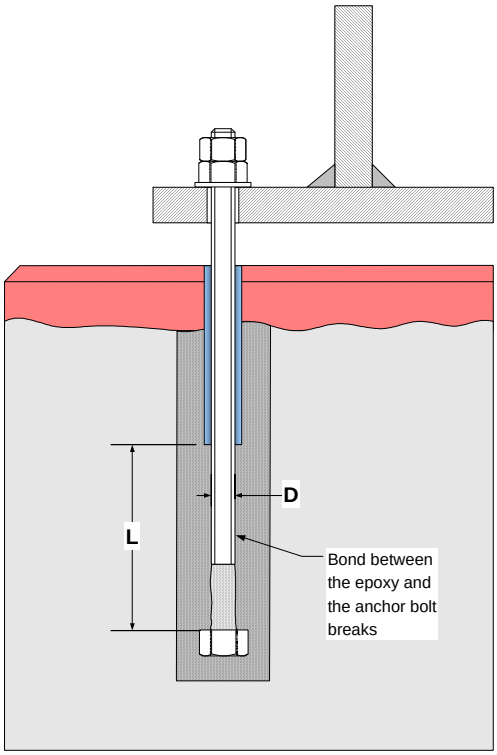
$$F = BD \times \pi \times L \times 1600 \text{ psi}$$

Where:
F = Bolt Pullout Force in lbs.
D = Bolt Diameter in inches
L = Length in inches of the bolt embedded in grout (does not include the portion of the bolt that is wrapped with tape or inside a bolt sleeve.

π = 3.1415

Examples of the force required to separate a bolt from the surrounding epoxy assuming there is no nut.

PULL OUT STRENGTH IN POUNDS				
	GROUTED BOLT LENGTH			
BOLT DIAMETER	3”	4”	5”	10”
3/8"	5,650	7,530	9,420	18,840
1/2"	7,540	10,040	12,560	25,120
3/4"	11,300	15,070	18,840	37,680
1"	15,070	20,100	25,130	50,260
1.5"	22,610	30,150	37,690	75,380



Pull-Out Strength – Anchor Bolt in Concrete

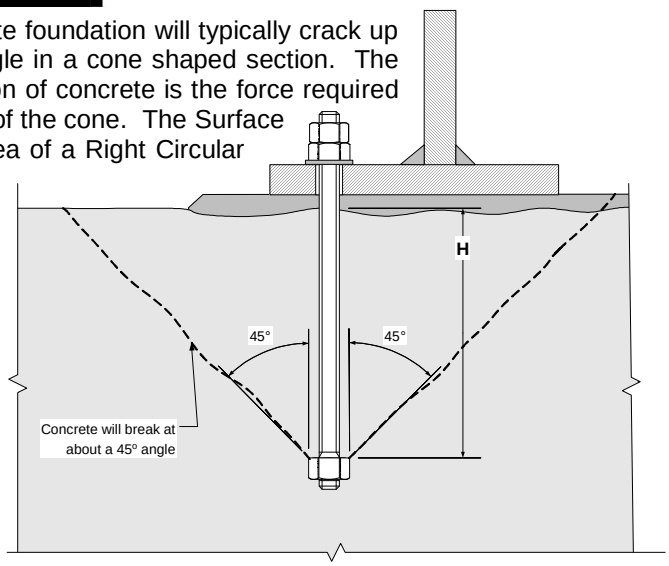
As a comparison, an anchor bolt set in a concrete foundation will typically crack up and out from the bottom of the bolt at a 45° angle in a cone shaped section. The force required to pull up this cone shaped section of concrete is the force required to separate concrete over the total surface area of the cone. The Surface Area of a Cone (SACone) = Lateral Surface Area of a Right Circular Cone with 45° Sides:

$SACone = \pi \times 1.4142 \times H^2$

The force required to pull the concrete apart is the Shear Strength of concrete (800 psi) times the Surface Area of the Cone.

Force lbs = 800 psi x SACone in^2

Force lbs = $800 \times \pi \times 1.4142 \times H^2$



Date

08/2005

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST® Orange Hardener Ratio Guide

for Chocking Between Steel & Steel

Technical Bulletin # 693B

Bulletin Description

The purpose of the hardener in every epoxy compound or coating is to cause a reaction to that will result in the hardening of the epoxy resin. This reaction usually creates heat within the epoxy that forces the molecules to cross-link and bond tightly together. Depending on the type and quantity of resin, additives and hardener used, the final epoxy product will have certain physical properties such as compressive strength, flexibility, hardness, shear strength, shock resistance, etc.

The overwhelming majority of epoxy compounds have a fixed ratio of resin to hardener that results in a product with predictable physical properties. However, rather than specify an exact amount of hardener to use with CHOCKFAST Orange, ITW Polymer Technologies asks the end user to determine the correct amount for a particular installation that will cause the compound to achieve maximum physical properties strength. The amount of hardener is determined based on the temperature of the steel of the surrounding chock and the thickness of the chock.

By varying the amount of hardener used, the reaction that takes place between the resin and the hardener can be managed. The goal is to achieve a relatively high exothermic heat within the CHOCKFAST without causing it to either boil or crack. It is this high heat that gives CHOCKFAST Orange its exceptional strength characteristics.

Using CHOCKFAST Orange between two pieces of steel is different that using it between steel and concrete or steel and epoxy. Steel has a much greater ability to absorb heat from the CHOCKFAST during the curing process. For this reason, slightly more hardener is used when pouring CHOCKFAST between two pieces of steel.

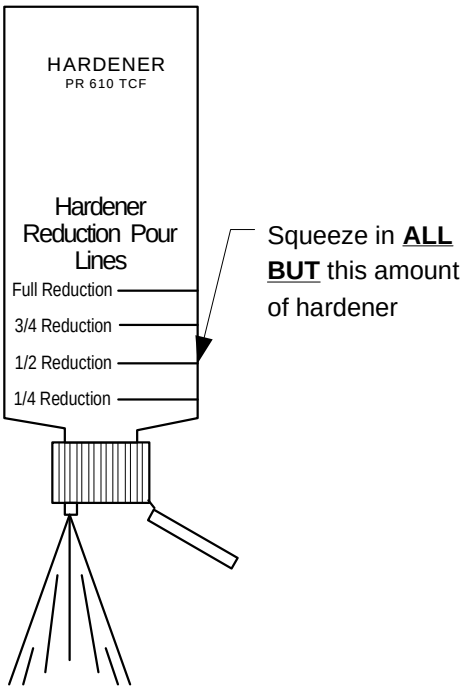
Application Instructions

Note that before mixing the resin and hardener that the resin temperature should be in the range 20º to 25ºC (68º-77ºF).

The maximum amount of hardener possible should normally be used. The graph on the following page is for guidance and the optimum amount will usually be slightly more than it shows.

After puncturing the metal foil seal, the hardener bottle is inverted and squeezed to discharge the hardener into the resin container. The hardener reduction lines are to be read with the bottle inverted as shown.

Dispose of excess hardener in an approved manner and do not collect the remainder of several bottles in one bottle as it may be mistaken for a complete hardener unit. It is usually best to mix left over hardener in the empty cans of CHOCKFAST. The hardener will combine with the left over resin and become inert.



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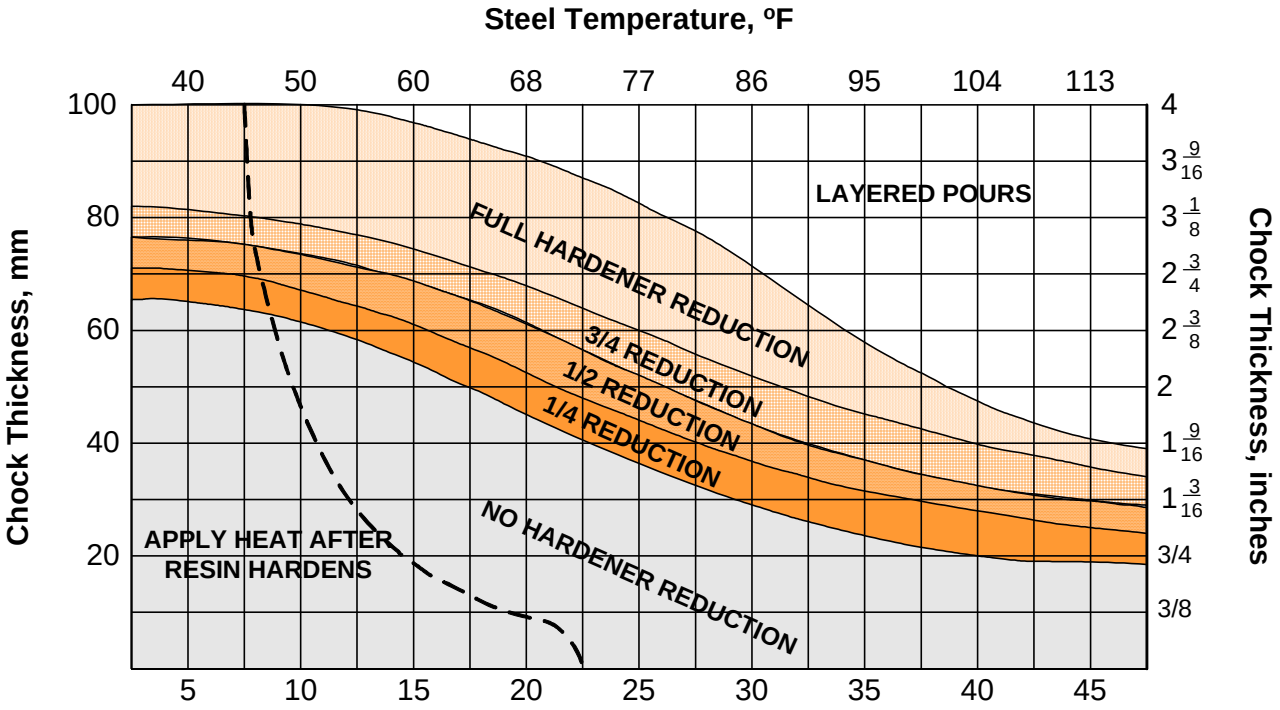
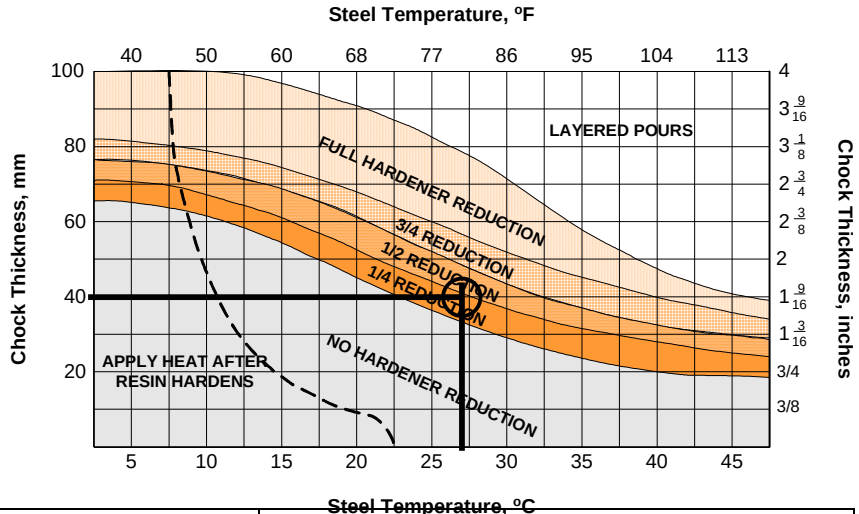


Example:

40 mm (1-9/16”) chocks & a steel temperature of 27º C (80º F) requires a 1/4 Hardener Reduction



EQUIPMENT FOUNDATION SYSTEMS

ITW Polymer Technologies

Comparison of Physical Properties between SUPER ALLOY® and a Leading Competitive Material

Technical Bulletin # 822A

Figures presented are intended to help you make a practical comparison between SUPER ALLOY and competitive materials. They are typical values achieved after seven day cure at room temperature 72°F (21°C) by an independent testing lab.

TEST	STANDARD	SUPER ALLOY	COMPETITIVE
Compressive Strength	ASTM D-695	15,200 psi	13,600 psi
Hardness Shore D	ASTM D-1706	87	87
Adhesive Tensile Shear	ASTM D-1002	2,000 psi	2,186 psi
Abrasion Resistance	Standard 406 Method 1091: mg/1000 cycles Avg. 5000 cycles	Federal Test 20 mg. wt. loss per 1000 cycles	101 mg. wt. loss per 1000 cycles
Flexural Strength	ASTM D-790	7,700 psi	8,400 psi
Material Machinable within:		3 hours	6 hours
Complete Cure within:		18 hours	24 hours
Cost Differential			5-50% more costly than SUPER ALLOY

ADVANTAGES:

ITW Polymer Technologies' local distributor network providing dependable availability, convenience and technical service.

Superior abrasion resistance.

Faster service time for machining.

Faster curing rate for decreased downtime.

Major cost savings on large and small projects.

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EQUIPMENT FOUNDATION SYSTEMS

Chockfast

Physical Characteristics

of Various Chocking Compounds

Technical Bulletin # 840C

Bulletin Description

This bulletin compares the physical characteristics and the product information of the three chocking compounds offered by ITW Polymer Technologies. This information is presented in a side-by-side format to make the selection the right chocking compound for the job faster and easier.

Physical Properties

	CHOCKFAST® BLACK	CHOCKFAST® ORANGE	CHOCKFAST® GRAY
RELEVANT TECHNICAL BULLETIN	666	659	656
COMPRESSIVE STRENGTH ASTM D-695	119 MPa (17,300 psi)	131 MPa (19,000 psi)	110 MPa (16,000 psi)
COMPRESSIVE MODULUS OF ELASTICITY ASTM D-695	5517 Mpa (800,000 psi)	3675 MPa (533,000 psi)	3586 Mpa (520,000 psi)
LINEAR SHRINKAGE ASTM D-2566	0.00018 mm/mm (0.00018 in/in)	0.0002 mm/mm (0.0002 in/in)	0.0003 mm/mm (0.0003 in/in)
COEFFICIENT OF LINEAR THERMAL EXPANSION ASTM D-696 0°C-60°C (32°F-140°F)	27.0 X 10^{-6}/C° (15.0 X 10^{-6}/F°)	30.8 X 10^{-6}/C° (17.1 X 10^{-6}/F°)	30.8 X 10^{-6}/C° (16.8 X 10^{-6}/F°)
FLEXURAL STRENGTH ASTM C-580	42.7 MPa (6,200 psi)	52.5 MPa (7,615 psi)	
FLEXURAL MODULUS OF ELASTICITY ASTM C-580	9930 MPa (1.4 X 10^{6} psi)	5930 MPa (8.6 x 10^{5} psi)	
TENSILE STRENGTH ASTM D-638	20 MPa (2,900 psi)	34.2 MPa (4,970 psi)	27.5 MPa (4,000 psi)
HARDNESS ASTM D-256	55 BARCOL	40-45 BARCOL	35-40 BARCOL
IZOD IMPACT STRENGTH ASTM D-256	0.023 N.m/mm (5.1 in lb/in)	0.027 N.m/mm (6 in lb/in)	0.032 N.m/mm (7.2 in lb/in)
FIRE RESISTANCE ASTM D-635	Self Extinguishing	Self Extinguishing	Self Extinguishing
SERVICE TEMPERATURE			
MAXIMUM POUR DEPTH	62 mm (2-1/2 in)	100 mm (4 in)	50 mm (2 in)
SPECIFIC GRAVITY	1.94	1.58	1.82

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Product Information

COVERAGE	4.34L 265 in^3	120/260 in^3	13.37/3.06L 816/187 in^3
APPLICATION TEMPERATURE			
CURE TIME (approximate)			
POT LIFE @ 21°C (70°F)	45 minutes	25-30 minutes	30-40 minutes
CLEAN UP			
PACKAGING per Unit			
UNIT WEIGHT			
SHELF LIFE			

NOTE: The physical properties quoted above are for laboratory prepared specimens. Tests on specimens from a job site may not be identical.

Reference

For design considerations and application details please request Bulletin No. 642 or contact ITW Polymer Technologies' Engineering Services Department.

Date

09/2005

EQUIPMENT FOUNDATION SYSTEMS

CHOCKFAST Red & Red SG

Guidelines for Storing, Mixing & Pouring

Technical Bulletin # 1024D

Bulletin Description

The following CHOCKFAST surface preparation, mixing, pouring and storing procedures have been written as an aid for contractors and end users applying CHOCKFAST on a job site. If the application procedures are not adhered to it is recommended that the user contact ITW Polymer Technologies or the local distributor for alternate methods. The nearest distributor can be located on our web page at www. Chockfastgrout.com. All procedures in this bulletin apply to CHOCKFAST RED and CHOCKFAST RED SG unless stated otherwise.

CHOCKFAST RED.-fast curing, high compressive and tensile strength grout that can be applied 50mm (2 in.) to 46cm (18 in.) in thickness.

CHOCKFAST RED SG-fast curing, high compressive and tensile strength grout that can be applied 25mm (1 in.) to 100mm (4 in.) in thickness. A cold weather additive with Red SG will enable grouting at 0°C (32°F).

Grout Storage

*All grout materials should be stored in a dry, shaded area in original unopened containers. Recommended storage temperatures are 16° - 35° C (65°- 95°F).

*The materials have a shelf life in excess of 12 months.

*The grouting materials should be preconditioned to a minimum of 19° - 27° C (65° -80°F) for 24 to 48 hours before mixing and application. (Chockfast Red SG mixed with the cold weather accelerator additive does not need to be preconditioned).

*Construct a shelter over the foundation to protect the work area from the elements particularly during cold, wet or very hot conditions.

Foundation Preparation

*New concrete needs to be 21 to 28 days fully cured. It must also have a minimum compressive strength of 210 kg/cm² (3000 psi) and minimum tensile strength of 21 kg/cm² (300 psi). In order to insure a good bond of epoxy to the concrete, check that hydration has ceased.

*The concrete should be chipped to remove all laitance and 50% of the fractured coarse aggregate exposed to provide a rough bonding surface for the epoxy. A ¾ chisel bit is the preferred tool. A bushing tool should not be used. Dowels should be installed on new exposed concrete to prevent edge lifting.

*The concrete foundation should be dry and oil free before the pouring of grout.

*Form as for concrete using good quality form material. Fit 30mm x 45mm (1-3/16 in. x 1-3/4 in.) chamfer pieces. Wax or grease all surfaces of forming in contact with resin. Seal all gaps with suitable mastic or putty.
*Sleeve all foundation bolts in way of resin to prevent adhesion and to allow bolt stretch.

*Construct head boxes if resin has to flow more than one meter (3 ft).

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Preparation of Baseplate or Soleplates

*All 90 angles on steel work in contact with the epoxy should be rounded to reduce stress concentrations in the grout. Round shim stock is preferred.

*Surfaces of baseplates or soleplates in contact with grout should be sandblasted to a clean, oil free, dry surface. Epoxy primer can be applied to the clean metal surfaces to prevent rusting.

Mixing and Pouring

*Remove lid from resin/hardener container and pour the hardener into the resin. Mix with a low speed drill and 12mm Jiffy Mixer blade for 3 minutes.

*Chockfast Red should be mixed in a 15 –20 rpm mortar mixer capable of holding a minimum of 90.6 lit (3.2 cu ft).

*Add the pre mixed liquids to mortar mixer and one bag of aggregate. Progressively add the remaining bags of aggregate assuring a homogeneous mix. **Mixing is complete when aggregate is wet** (for the first mix ½ a bag of aggregate should be withheld to facilitate the "wetting out of the mixer").

*Subsequent mixes should contain 4 bags. Never reduce aggregate by more than half a bag to improve flow.

*It is important to mix the grout until the 4 bags of aggregate have been "**wetted out**". Over mixing will encourage the entrapment of air.

*Pour the Chockfast Red as soon as possible after mixing.

*Protect newly poured Chockfast Red from sudden temperature changes and direct sunlight.

*Additional layers of Chockfast can be poured providing the initial pour has returned to an ambient temperature and the surface has been roughened up to provide a mechanical bond.

Product Information

	CHOCKFAST Red	CHOCKFAST Red SG
APPLICATION TEMPERATURE		
POT LIFE	2-3 hours @ 21°C (70°F)	40 minutes @ 21°C (70°F)
CURE TIME (approximate)	54 hours @ 16°C (60°F) 36 hours @ 21°C (70°F) 36 hours @ 21°C (70°F) 18 hours @ 32°C (90°F)	48 hours @ 16°C (60°F) 24 hours @ 21°C (70°F)

Reference

For design considerations and application details please request Bulletin No. 643 or contact ITW Polymer Technologies' Engineering Services Department.

Date

1/2007

CWC Industrial

CWC 604 Machine Bond®

Specifications for Installation

Technical Bulletin # 1105B

1.0 SCOPE

1.1. These specifications are to provide the product and procedural information necessary for the proper installation of CWC 604 Machine Bond epoxy resin grout.

1.2. CWC 604 Machine Bond shall be installed in accordance with these specifications and the recommendations of ITW Polymer Technologies.

1.3. These specifications cover the use of CWC 604 Machine Bond when mixed in full two cubic foot unit amounts. Consult with ITW Polymer Technologies before installation if there is intent to mix components in less than full unit amounts.

1.4. The words “epoxy resin grout”, “epoxy grout” and “grout” shall herein refer to CWC 604 Machine Bond epoxy resin grout.

2.0 APPLICATION

2.1. CWC 604 Machine Bond is designed to provide:

2.1.1. Permanent vertical support of heavy machinery, compressors, engines, and production equipment critical to maintaining precision alignment.

2.1.2. Uniform transfer of static and dynamic loads to the concrete foundation and pad.

3.0 PRODUCT CHARACTERISTICS

3.1. CWC 604 Machine Bond is a three-component, 100% solids, epoxy resin grout possessing the following qualities:

3.1.1. EXCELLENT CHEMICAL AND PHYSICAL PROPERTIES
3.1.2. SUPERIOR FLUID CONSISTENCY
3.1.3. SELF-LEVELING
3.1.4. LOW EXOTHERMIC CURE
3.1.5. DEEP MONOLITHIC POURS (18+ INCHES)
3.1.6. EXTENDED PLACEMENT TIME

3.2. Contact your local ITW Polymer Technologies Representative for deeper pours including reconstruction of crude foundations where large volumes of concrete have been removed.

4.0 MATERIAL

4.1. CWC 604 Machine Bond epoxy resin grout shall be mixed and placed when the ambient temperature of the “work area” coincides with the design temperature range stated in Section 10.4 - Grout Working and Curing Table.

4.2. If weather conditions (i.e. temperature, sunlight, moisture, wind) warrant it, the “work area” shall be enclosed by a temporary shelter and conditioned to the requirements stated in these specifications for placement and cure of CWC 604 Machine Bond.

4.3. CWC 604 Machine Bond is for use in installations where the grout bed temperatures will not exceed 185°F (85°C) during the operation of the machinery or equipment.

4.4. One unit of CWC 604 Machine Bond includes Resin (Part A) and Hardener (Part B) in a 5-gallon (19 liter) two-compartment container and four 60 lb. (27.2 kg) bags of Aggregate (Part C). The shipping weight of one unit of CWC 604 is 284 lbs. (129 kg); one unit will yield 2 cu. ft. (0.057 m^3) of grout.

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5.0 STORAGE & HANDLING

5.1. Grout shall be kept dry and protected from extreme temperatures. Both the epoxy resin and hardener liquids, and the aggregate shall be stored in a dry shelter at an ambient temperature of not less than 75F (24C) nor more than 90F (32C) for a period of 24 hours prior to mixing. It is of extreme importance that the aggregate (Part C) is absolutely dry at the time of mixing.

5.2. Components A, B, and C are packed in pre-measured amounts. Use care when transporting containers and bags of aggregate to prevent a puncture or tear. Repair as quickly as possible should this occur.

6.0 FOUNDATION & METAL PREPARATION

6.1. It is recommended that the concrete foundation shall cure a minimum of 28 days prior to the application of CWC 604 Machine Bond to assure the concrete design strength is achieved and shrinkage of the concrete foundation is negligible. If work must proceed prior to 28 days, consult ITW Polymer Technologies before grouting.

6.2. Prepare concrete surface areas to be covered with epoxy grout by chipping and removing all laitance, dirt, dust, and oil-soaked or damaged concrete to provide an irregular, rough, sound, and clean surface for good bonding. Remove all water and dry out each foundation bolt sleeve. A pliable material (i.e. silicone) may be used to fill each foundation bolt sleeve to inhibit the introduction of water, oils, or other foreign materials.

6.3. Seal each foundation bolt sleeve tightly at the top to prevent epoxy grout from entering the sleeves if they are not to be filled with epoxy grout.

6.4. Metal surfaces such as sole plates, rails, reinforcing steel, machinery or equipment bases to be imbedded in epoxy grout shall be thoroughly cleaned of any rust, oil, paint, grease, dirt, or other foreign matter to ensure a good bond with the epoxy grout. The best bond will be established on a surface that has been sandblasted to white metal then cleaned with IMPAX IXT-59 solvent.

6.5. Leveling screws or other items, which must be kept free of grout, shall be protected with caulking, plastic tape, or similar means.

6.6. The entire foundation and grout bed as well as all sole plates, rails, and machinery shall be protected from direct sunlight, rain, and sudden temperature changes during the grout placement and curing cycle.

7.0 FORMWORK

7.1. Forms may be of regular lumber or any material of sufficient strength to withstand the pressure of the grout. Forms shall allow for hydraulic head as needed to facilitate the filling of the grout bed area. The contractor shall verify the finished elevation of the formwork to ensure that the elevations meets or exceeds the finished level of the grout. A chamfer strip shall be fastened to the inside of the forms at finished grout elevation to avoid sharp corners.

7.2. Forms are to be completely sealed and rendered watertight with heavy consistency, pliable caulking or mortar. Forms placed over horizontal, rough concrete surfaces may be sealed at the bottom with a stiff sand and cement mortar flush with the inside of the forms. Place mortar dam immediately prior to beginning mortar operations as shrinkage of the mortar may permit leakage of the epoxy grout. CWC 604 Machine Bond is not self-sealing and will leak until the solidification of the grout occurs.

7.3. Contractor shall coat all formwork to be in contact with the epoxy grout with more than one coat of an industrial paste wax to ensue trouble-free release of forms. Plastic sheet is acceptable, but must be stretched tight to prevent folds and wrinkling.

8.0 CONTROL JOINTS

8.1. Whenever the grout bed exceeds 5 ft. (1.5m) in length and/or width, control joints should be placed perpendicular to the long dimensions of the block, usually 4 ft. (1.2m) to 6 ft. (1.8m) intervals. The exact locations should be determined by the equipment configuration. They should never be placed in a load-bearing area such as a sole plate or chock.

9.0 GROUT MIXING PROCEDURES

9.1. All material and equipment for mixing, placing, and cleanup shall be on hand before any mixing is started. All mixing and placing equipment shall be clean and dry. Check all motorized equipment to make sure it is operable.

9.2. Remove the inner container (Hardener-Part B) from the outer 5-gallon (19 liter) container of CWC 604 Machine Bond. Pour the hardener (Part B) into the Resin (Part A) in the outer 5-gallon container. Use a small rubber squeegee or plastic spatula to make sure all material is removed from the sides and bottom of the container. Mix thoroughly for three minutes with a slow speed (200-300 RPM) drill and a jiffy mixer attachment. Pour the mixture into a 3 to 6 cu. ft. (0.08 to 0.17m^3) mortar mixer. When the temperature of the CWC 604 Machine Bond grout material is between 60°F and 70°F (15°C and 21°C) it is desirable to allow the mixed liquid components of Part A and Part B to stand five minutes in the 5-gallon container before placing into the mixer and adding the Aggregate (Part C).

9.3. Add one bag of Part C Aggregate prior to the start of the mixing blades. Begin mixing and add the three remaining bags. Mix only until the aggregate is thoroughly wet. Care must be taken not to over mix.

9.4. Do not add solvent, water, or foreign material when mixing grout or permit such on the grout bed surface until solidification of the grout occurs. For special situations where additional aggregate or a different aggregate than provided is desired consult an ITW Polymer Technologies Representative.

10.0 WORKING TIME AND CURING TIME

10.1. "Working time" (or "pot life") indicates the time interval between the point of mixing an epoxy grout and the point when hardening begins. The length of the "working time" is affected by the temperature of the grout components at the time of mixing, the ambient temperature of the work area, the temperature of any surface in contact with the grout, and by the volume of the grout used. (See Section 10.4 - Grout Working and Curing Table.)

10.2. Curing time indicates the average time in hours required for the grout bed to acquire adequate physical properties for design loads.

10.3. Where the foundation mass and grouting surface area temperatures are lower then average ambient temperature of the "work area", the cure time shall be extended to compensate for the effect of this lower temperature influence on the grout bed.

10.4. AVERAGE WORKING AND CURING TIME (IN HOURS)

AVERAGE WORKING AND CURING TIME (IN HOURS)										
Ambient Temperature	°F °C	60 16	65 18	70 21	75 24	80 27	85 29	90 32	95 35	100 38
Working Time		6	5	4	3 ½	3	2 ½	2	1 ½	1
Curing Time		60	45	45	40	35	30	25	20	15

10.5. Higher "work area" and foundation temperatures may be affected to hasten the cure of the grout. When external heat is employed, do not exceed the maximum temperature limits indicated in the curing table. The external heat must be distributed uniformly throughout the "work area". At the completion of the curing cycle the temperature shall be lowered slowly, no more than 40°F (22°C) in 24 hours, to avoid the possibility of damage due to sudden contraction.

10.6. During the initial cure, and for at least 30 days thereafter, the grout bed shall be protected so that the temperature of the grout bed does not vary by more than 40°F (22°C) in a 48 hour period.

11.0 GROUT PLACEMENT AND FINISHING

11.1. Foundation and metal surfaces to be grouted shall be prepared as outlined in Section 6 - Foundation and Metal Surface Preparation.

11.2. A final cleaning with IMPAX IXT-59 Solvent of metal surfaces to be imbedded in epoxy grout shall be accomplished immediately prior to grouting.

11.3. Begin filling formwork at one end and maintain level grade as grout progresses to the other end of the form. The grout shall progressively fill voids under the equipment base, sole plate, or rail in a one-direction flow. The grout will flow and seek its own level under normal conditions. Please contact an ITW Polymer Technologies Representative regarding aggregate reduction in case of adverse conditions.

11.4. Check forms frequently during application for leaks. Seal any leaks immediately with a stiff sand and cement mortar or putty.

11.5. All working procedures must be completed within the grout working time as indicated in Section 10.4 - Grout Working and Curing Table.

11.6. IMPAX IXT - 59 Solvent may be used for finishing grout surfaces. When the grout begins to solidify, a trowel dipped in IMPAX IXT - 59 Solvent may be lightly moved across the surface to smooth and provide a shiny finish. Care shall be taken to not allow excess solvent to build up on the grout surface.

11.7. Formwork shall be left in place until grout has solidified.

11.8. Once the grout bed has attained initial cure the jacking bolts or other devices used for support during the grouting and curing period shall be relieved of all stresses or removed. Voids in grout beds caused by the removal of wedges or plates shall be filled with grout.

11.9. Two coats of IMPAX 2001CRE Epoxy Coating are to be applied to the concrete foundation surfaces not covered by CWC 604 Machine Bond (e.g. under the oil sump of engines). This is recommended to prevent penetration of oils, greases, water, and other substances. IMPAX 2001 CRE Epoxy Coating may be applied to the exposed surface areas of the epoxy grout and adjacent concrete to produce an appealing finish with outstanding durability.

12.0 CLEANUP

12.1. Clean water with soap should be used to clean equipment and tools. To clean mixer, fill the drum with water and one bag of silica sand and mix until clean.

13.0 PRE-GROUTING

13.1. Pre-grouting of machinery or equipment sole plates, rail plates, bearing plates, anchor bolts, or other devices shall be accomplished per instructions outlined in these specifications.

14.0 HEALTH PRECAUTIONS

14.1. CWC 604 Machine Bond is a low toxicity system; however, any epoxy resin may produce allergic reactions in some persons. Do not take internally. Persons handling this material should avoid skin contact. The use of gloves or other protective equipment is recommended. Contaminated areas of the body should be cleaned and scrubbed with soap and water. In case of contact with the eyes, flood with water and contact a physician immediately. Use CWC 604 Machine Bond in well-ventilated areas and avoid breathing fumes and aggregate dust.

EQUIPMENT FOUNDATION SYSTEMS

CWC Industrial

CWC 604 Machine Bond®

Chemical Resistance Chart

Technical Bulletin # 1119A

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

ACETALDEHYDE CONC.	S
ACETIC ACID - UP TO 12%	R
ACETIC ACID - 12 TO 20%	S
ACETIC ACID - OVER 20%	N
ACETONE - 100%	N
ACIDS, DILUTE INORGANIC	R
ACIDS, CONCENTRATED	N
ACRYLIC ACID	N
AIR	R
ALCOHOLS	R
ALDEHYDES	S
ALLYL CHLORIDE	S
ALUM, AMMONIUM	R
ALLUMINUM CHLORIDE	R
ALUMINUM SULFATE	R
ALUMINUM POTASSIUM SULFATE	R
ALIPHATIC HYDROCARBONS	R
AMMONIA, 10%	R
AMMONIA, 25%	N
AMMONIUM CHLORIDE	S
AMMONIUM BICARBONATE	R
AMMONIUM BIFLUORIDE	S
AMMONIUM NITRATE	S
AMMONIUM PHOSPHATE	S
AMMONIUM SULFATE	S
AMYL ACETATE	R
AMYL ALCOHOL	R
AMYL CHLORIDE	S
ANILINE	N
ANTIMONY CHLORIDE, TRI-	R
AROMATIC HYDROCARBONS	R
BEER	S
BENZELDEHYDE	N
BENZENE	N
BENZENE HEXACHLORIDE	R
BENZENE SULFONIC ACID	S
BLACK LIQUOR	R
BLEACH LIQUOR	S
BORIC ACID	R
BROMINE WATER	S
BUTYL ACETATE	S
BUTYL ALCOHOL (BUTANOL)	R
BUTYL CELLOSOLVE	R
BUTYRIC ACID	R

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R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

CALCIUM CHLORATE	S
CALCIUM CHLORIDE	R
CALCIUM HYDROXIDE	R
CALCIUM HYPOCHLORITE	S
CARBON BISULFIDE	S
CARBON TETRACHLORIDE	S
CAUSTIC SODA	R
CAUSTIC POTASH	R
CHLORINATED SOLVENTS	S
CHLORINE SOLUTION	S
CHLORINE GAS	R
CHLOROBENZENE	N
CHLOROSULFONIC ACID, DILUTE	R
CHROMIC ACID - UP TO 20%	R
CHROMIC ACID - OVER 20%	N
CITRIC ACID 50%	S
CITRIC ACID, DILUTE 20%	R
COPPER CHLORIDE	R
COPPER SULFATE	R
CRUDE OIL, SWEET/SOUR	R
CYCLOHEXANOL 100%	R
CYCLOHEXANONE 100%	N
DETERGENTS	R
DIBUTYL PHTHALATE	S
DIETHYL ETHER	R
DIETHYLENETRIAMINE 10%	N
DIMETHYL PHTHALATE	S
DIOXANE	N
ETHERS	S
ETHYL ALCOHOL 96% (192 PROOF ETHANOL)	S
ETHYL BENZENE	N
ETHYLENEDIAMINE	N
ETHYLENE DICHLORIDE	S
ETHYLENE GLYCOL	R
FATTY ACIDS	R
FERRIC CHLORIDE	R
FERRIC NITRATE	S
FERRIC SULFATE	R
FORMALDEHYDE, 10%	R
FORMIC ACID	N
GASOLINE, REGULAR	R
GASOLINE, AVIATION	R
GLYCERIN (GLYCEROL)	R

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

HEXANE	R
HEXYLENE GLYCOL	R
HYDROBROMIC ACID	S
HYDROCHLORIC ACID, 20%	R
HYDROCHLORIC, CONCENTRATED	S
HYDROCYANIC ACID	S
HYDROFLUORIC ACID	S
HYDROGEN PEROXIDE, DILUTE	S
HYDROGEN SULFIDE	S
HYPO SOLUTION	R
HYPOCHLOROUS ACID	S
IODINE	S
JET FUEL	R
KEROSENE	R
KETONES	S
KRAFT COOKING OIL, ACID	R
KRAFT COOKING OIL, 250°F	S
LACTIC ACID (DILUTE)	R
LINSEED OIL	R
MAGNESIUM CHLORIDE	R
MAGNESIUM SULFATE	R
MALEIC ANHYDRIDE	S
MERCUROUS NITRATE	S
METHYL ALCOHOL (METHANOL)	S
METHYLENE DICHLORIDE	N
METHYL ETHYL KETONE	S
MILK	R
MINERAL OIL	R
MOLASSES	R
MOTOR OIL	R
NAPTHA	R
NICKEL CHLORIDE	R
NICKEL SULFATE	R
NITRIC ACID - 10%	R
NITRIC ACID, CONCENTRATED	N
NITROBENZENE 100%	N
OLEIC ACID	S
OXALIC ACID	S
OXYGEN	R

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

PHENOL	N
PHOSPHORIC ACID, DIL.	R
PLATING SOLUTIONS	S
POTASSIUM CARBONATE	R
POTASSIUM CHLORIDE	R
POTASSIUM DICROMATE	S
POTASSIUM HYDROXIDE 40%	S
POTASSIUM NITRATE	S
SEA WATER	R
SOAP SOLUTION	R
SODIUM BISULFATE	R
SODIUM BICHROMATE SOL. 66g /100	R
SODIUM CARBONATE	R
SODIUM CHLORIDE	R
SODIUM CHLORITE 10g/100	S
SODIUM HYDROXIDE, 50%	S
SODIUM HYPOCHLORITE	S
SODIUM METHOXIDE	S
SODIUM NITRATE	S
SODIUM PHOSPHATE, TRI	R
SODIUM SULFATE	R
SODIUM THIOSULFATE	S
STEARIC ACID	R
STANNIC CHLORIDE	R
STYRENE	N
SUGAR	R
SULFAMIC ACID	R
SULFUR DIOXIDE	R
SULFURIC ACID, 20%	R
SULFURIC ACID, 50%	S
SULFURIC ACID, 95%	N
TANNIC ACID	S
TARTARIC ACID	R
TETRACHLOROETHANE	N
TETRAETHYLENE PENTAMINE	R
TOLUENE SULFONIC ACID	S
TOLUENE	N
TRICHLOROACETIC ACID	N
TRICHLOROETHYLENE	N
TRISODIUM PHOSPHATE	R
TURPENTINE	N

R – RESISTANT TO IMMERSION OR PROLONGED CONTACT
S – RESISTANT TO SPLASH AND SPILLAGE ONLY
N – NOT RECOMMENDED

UREA	R
URINE	R
VINEGAR	R
WATER, ACID, HOT, STEAM	S
WATER, BOILING	S
WAX EMULSION	R
WINE	R
XYLENE	R
ZINC CHLORIDE	S
ZINC SULFATE	S

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EQUIPMENT FOUNDATION SYSTEMS

ESCOWELD® 7505E/7530 Grout Installation

Procedure for Installing Heavy Equipment

Technical Bulletin # 1600B

Bulletin Description

The following grout installation instructions apply to standard ESCOWELD Epoxy Grout applications on concrete foundations where the grout thickness is within the specified range. Outside this range, please consult your CHOCKFAST distributor for guidance.

Material Check List

The following materials are required to effectively install ESCOWELD epoxy grout. Assemble all materials prior to starting any work.

1. Adequate supply of ESCOWELD 7505E/7530 Epoxy Grout. We recommend ordering 10% to 15% extra to account for spillage, waste, etc. depending on location of distributor.
2. Protective covering for floors and equipment.
3. Air compressor, hoses, chipping gun and auxiliary lighting.
4. Dust masks, goggles, hard hats, rubber gloves and ear protection. Also check with on-site safety personnel for safety equipment requirements.
5. Industrial vacuum cleaner.
6. Replacement anchor bolts if needed.
7. Sandblasting equipment, ventilation equipment if necessary.
8. Tape or split hoses for isolating anchor bolts from grout.
9. Forming materials: lumber, Styrofoam, chamfer strips, nails, putty, weather stripping, paste wax and carpenters tools.
10. Grout mixing equipment: Wheelbarrows, mortar hoes and buckets or mechanical mortar mixer if required.
11. Warm soapy water or clean-up solvent and rags for clean up only.
12. An adequate number of people to help mix and install the grout.

Surface Preparation

For the foundation to successfully absorb vibration from the equipment there must be a solid connection from the equipment down through the baseplate and foundation and into the soil underneath. This requires a solid connection between the epoxy grout and the baseplate as well as the epoxy grout and the concrete foundation. The recommendations below are provided to help ensure this connection exists.

1. Metal surfaces to be in contact with the ESCOWELD *7505E/7530* Epoxy Grout should be dry and free of grease, paint and rust for optimum bonding. A bright metal surface can be obtained by sandblasting or grinding. In high humidity areas, equipment should be grouted immediately after sandblasting or grinding. If immediate grouting is not practical, these surfaces should be protected with a thin coat of ITW Rust Inhibitive Primer.
2. Concrete on which the grout will bear should have attained its design strength and shrinkage before grouting. The design strength, curing information and shrinkage information is available from the concrete supplier. All concrete surfaces that are to come into contact with ESCOWELD 7505E/7530 Epoxy Grout should be chipped approximately 1 inch in depth to remove laitance and provide a rough surface for good bonding and shear strength. If concrete is oil soaked, chip away concrete until oil or contaminants are removed. Only sound concrete is acceptable.
3. All shims, leveling screws, wedges and blocks that will eventually be removed from the installation should be covered with putty or wax prior to pouring ESCOWELD 7505E17530 Epoxy Grout.

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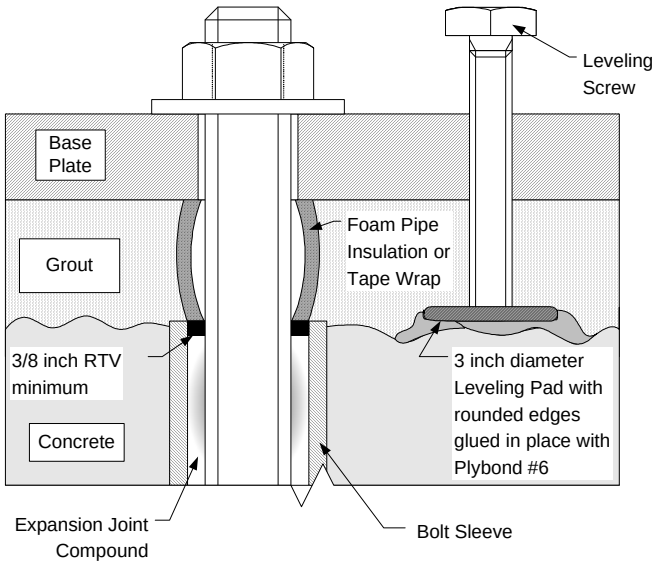
4. Pouring around anchor bolts completely with ESCCWELD 7505E/7530 Epoxy Grout restricts the spring effect capabilities of the full length of the bolt and should be avoided as follows:

   a. Anchor bolt sleeves should be packed with foam rubber, spray urethane foam, asphalt or other non-bonding material.

   b. Anchor bolts should be wrapped to provide a barrier between the ESCOWELD 7505E/7530 Epoxy Grout and the anchor bolts.



Forming Instructions

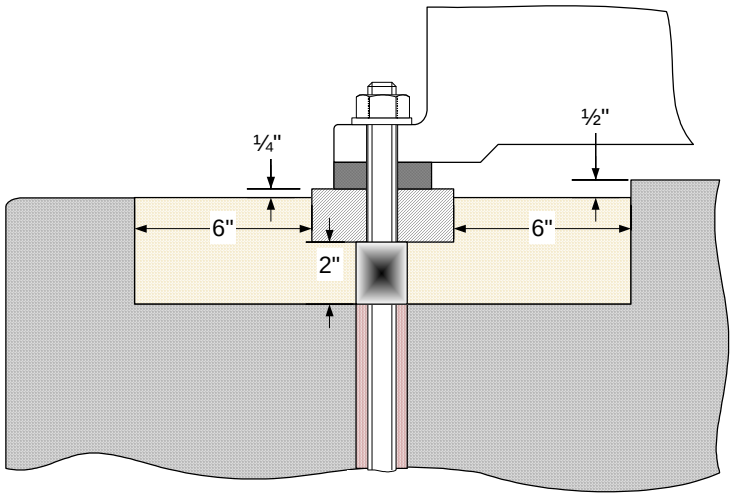
Forms to contain the epoxy grout are typically made from ¾ inch plywood and 2x4's and 2x6's. The following are some recommendations to improve the quality of the formwork.

1. For embedded machines, forms to contain ESCOWELD 7505E/7530 Epoxy Grout should be designed to provide a grout level of one-inch minimum above the engine frame bottom and to chamfer the outside edge of the grout. For rail or soleplate mounted machines, forms shall be designed to provide a grout level of ¼ inch minimum below the top of the rails or soleplates.

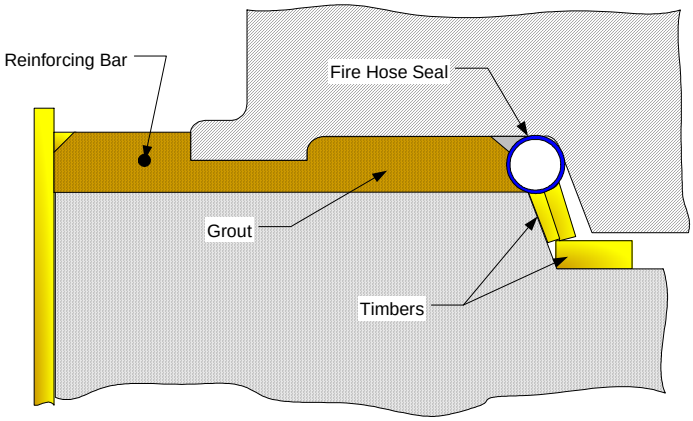
2. Forms should be liquid tight to prevent loss of epoxy grout materials. Any open spaces or cracks in forms at the joints or between forms and the foundation block should be sealed off using putty or duct seal.

3. All form material should be coated with 3 coats of heavy paste wax on all areas that will come into contact with ESCOWELD 7505E/7530 Epoxy Grout to prevent bonding.

4. For engines having a V-shaped oil pan, a seal may be made using a waxed or polyethylene wrapped fire hose to prevent the grout from leaking under the crankcase. The hose should be inflated with water not to exceed 10 psi.

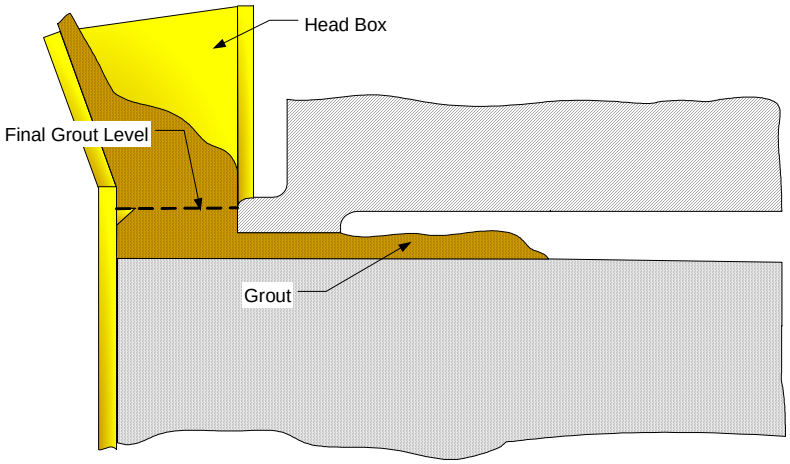


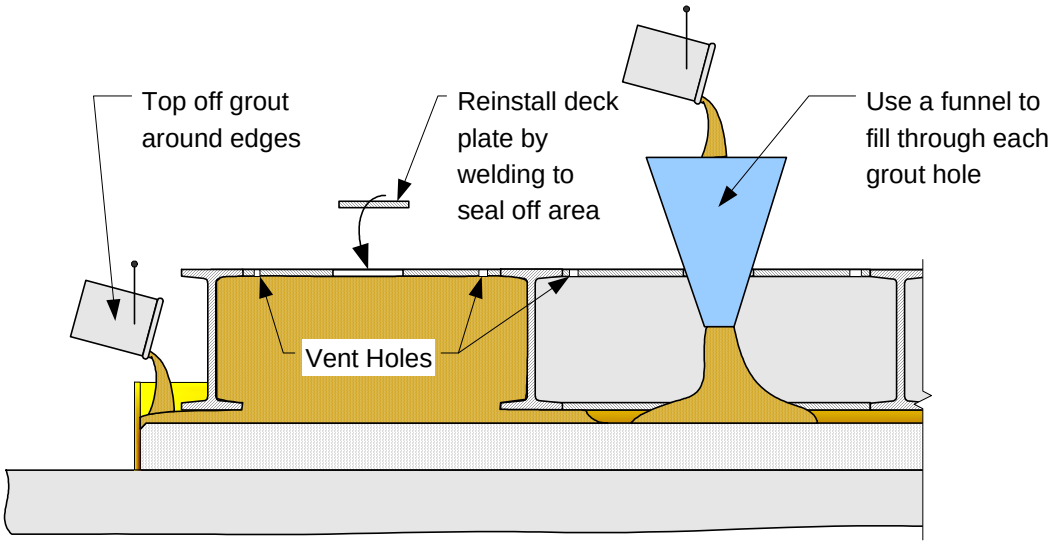
Rail / Soleplate Installation



A typical embedded installation where the grouted surface is narrow and grout does not have to flow a great distance.

5. Any sand, dust or other foreign material shall be removed from the foundation top after forming and sealing are complete.
6. Surfaces of machine-base rails or soleplates that are to be embedded in grout should be cleaned using a wiping cloth dampened with IMPAX IXT-59 Cleaning Solvent
7. Leveling screws should be coated with non-melt grease or a heavy wax film prior to pouring grout.





A typical I-Beam skid for heavy compressor equipment. Hand holes and vent holes should be strategically located between stages, etc., to facilitate grout placement under center longitudinal & transverse beams.

Expansion Joints

When expansion joints are required, the following procedures are suggested:

1. Expansion joints are normally placed in the non-load bearing shoulders. The expansion joint should be 1/2” to 1” thick. 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. In deeper pours closed cell foam can be bonded to thin wooden bracing material and tacked into the base of the form. The top of the foam expansion joint should be level with the finished surface of the grout. Care should be taken that this foam type expansion joint is not moved out of place during the pouring of the grout

2. Another procedure for placing expansion joints: a polyurethane foam strip or a waxed or polyethylene wrapped plywood form is fit firmly in place at pre-selected expansion joint locations. After the epoxy grout cures the foam strip or plywood Form can be removed. The gaps then may be filled with ITW Expansion Joint Compound. This will prevent oil penetration to the concrete. It is suggested that expansion joints be placed so that they isolate each soleplate or rail. In full bed applications, expansion joints should be placed every 4-6 Feet.

Reinforcing Bars

Rebar or reinforcing bars or rods can improve the overall strength and soundness of a grouted foundation. The following recommendations will improve the effectiveness of the rebar.

1. When pouring deep or long pours, steel-reinforcing bars may be used to minimize stress cracking. To distribute the stresses under these conditions, #4, or #5 rebar should be placed at 12-18' centers parallel to the equipment.
2. The rebar should be placed approximately 2" below the grout surface and if the rebar is tiered, the bottom rebar should be located 2" above the foundation surface.

Grout Mixing

1. Instructions on the ESCOWELD packaging labels relating to safety precautions in handling ESCOWELD 7505E/7530 material components should be closely followed.
2. Each unit consists of:
   - One pail containing 25.5 lb. (11.5 kg) of resin (Part A) in lower compartment and 10.2 lb. (4.55 kg) of converter (Part B) in top tray.
   - ESCOWELD® 7530 Aggregate (Part C): Five - 53 lb. bags
3. Always mix complete units. Do not vary the ratio of resin and converter or add solvent or water to change the consistency.
4. Pour the entire contents of ESCOWELD Part B Converter into Part A Epoxy Resins container. Mix thoroughly with a power drill at approximately 200-250 RPM using a Jiffy-type mixing blade. Mixing should be completed in 3 minutes. The net weight of the combined Part A and Part B is 35.7 lb. (16.2 kg). Over mixing or violent agitation will result in excessive air entrapment and should be avoided.
5. ESCOWELD 7505E/7530 Epoxy Grout is mixed using a motorized mortar mixer. Pour the mixture of resin and converter into the mortar mixer then blend the aggregate in slowly until the recommended aggregate ratio has been added. When using a mortar mixer, the maximum mixer blade speed should not exceed 15 RPM. Mix the grout only long enough to uniformly wet all the aggregate particles. Do not over-mix.
6. The first mixing batch will be stiffer in consistency due to some of the liquid wetting the sides of the mixer and blades. Withholding one-half bag of ESCOWELD® 7530 Aggregate from the First batch will compensate for loss of the liquid.
7. Working life of ESCOWELD 7505E/7530 Epoxy Grout

   ESCOWELD 7505E/7530 Epoxy Grout will exhibit the following approximate working time:

Temperature ^{o}F	Working Time - Minutes
90	50
77	120
60	150

Grout Placement

1. Cold Weather Considerations

   a. Storage Conditions - All ESCOWELD 7505E/7530 Epoxy Grout components should be stored at a temperature between 70°F-80°F. Since aggregate is the major component portion of the mix; its temperature will be the most critical in determining the final mix temperature.

   b. Surface Conditions - All surfaces that will come into contact with the grout should be maintained at a temperature of at least 50°F for 48 hours prior to and at least 48 hours after grouting

   c. Curing Conditions - For best results, fabricate temporary shelter around the equipment to be grouted and pre-condition the equipment and foundation. Typical materials for this shelter are canvas or polyethylene. Use conventional heating equipment and be careful not to overheat localized areas.

2. Hot Weather Considerations

   a. Storage Conditions - All ESCOWELDC 7505E/7530 Epoxy Grout components should be stored at temperatures between 70°F-80°F. Since aggregate is the major component portion of the mix, its temperature will be the most critical in determining the final mix temperature.

   b. Surface Conditions - Shading or other cooling methods such as fans should be used to cool the concrete and steel to below 90°F.

   c. Curing Conditions - Concrete and the equipment should be shaded 48 hours prior to grouting and 48 hours after placement of grout. It is suggested to proceed with the grouting operation in the early morning or at night after the equipment and foundation temperature drops. This allows heat development to take place during the coolest part of the day or evening.

3. Placing ESCOWELD 7505E/7530 Epoxy Grout

   a, Prior to the grouting operation, the work area adjacent to the equipment to be grouted should be protected to facilitate clean-up after pouring is completed.

   b. Proceed with grouting within a few hours after machinery leveling and alignment because castings have a tendency to creep or sag over a period of time when supported only by jack bolts. If a day or more elapses after leveling and alignment, re-check to confirm before grouting.

   c. Grout placement should proceed in a manner that will assure the filling of all spaces and complete contact of grout with the surface to be grouted. ESCOWELD 7505E/7530 Epoxy Grout should be poured starting at one end of the equipment and working toward the other end to prevent air pockets and voids.

   d. ESCOWELD~ 7505E/7530 Epoxy Grout has excellent placement consistency, but flow is enhanced using hydraulic head pressure. Construct a head box or funnel 1-2 feet deep to place the grout in these hard to reach places. Never allow the level of grout to fall beneath that of the baseplate because this will result in trapped air and voids. Do not vibrate as this will induce excessive air entrapment and result in a poor bearing area upon curing.

   e. Forms must be constantly checked for leaks. All leaks must be sealed immediately or voids will develop. Putty or duct sealing materials should be available to repair leaks.

   f. A smooth finish can be obtained by troweling the surface of ESCOWELD 7505E/7530 Epoxy Grout with a trowel wetted with IMPAX IXT-59 immediately after completing the pour. Care should be exercised to prevent blending solvent into the surface of the grout. This can result in a soft surface, which may take several days to harden.

   g. Upon completion of the grouting operation, all tools and mixing equipment should be immediately cleaned using water or IMPAX IXT-59 Clean-up Solvent.

Grout Curing

The following is a cure chart which can be used as a guide for determining final cure times. The temperatures shown are of the baseplate and foundation, not ambient temperatures.

Temperature - ^{o}F	Cure Time - Hours
90	12
80	24
70	36

Reference

For details on the ESCOWELD 7505E/7530 Epoxy Grout, please request Bulletin No. 1612 or contact ITW Polymer Technologies' Engineering Services Department.

Date

09/2005

ESCOWELD ®

Industrial Grouts & Polymers

The *ESCOWELD* ® Extended Aggregate Systems for Machinery Grouting and Foundations are designed to meet your installation and product performance needs.

The performance of any epoxy machinery grout system depends not only on the engineering and physical characteristics of the cured grout, but of the mixing and installation.

The new *ESCOWELD*® Enhanced and Super Aggregate Systems for machinery grouting and foundations offer you many benefits designed to simplify installation while providing excellent performance.

Key Benefits:

- **Simpler installation**
- **Greater yield/economy**
- **Excellent performance characteristics**

These unique systems combine The *ESCOWELD*® 7505E Resin/Hardener with *ESCOWELD*® 7530 aggregate with precisely graded enhanced aggregates to provide exceptional flow characteristics, while achieving a greater yield per unit. These systems are a cost effective replacement for polymer-modified concrete and essential for deeper pours and foundation rebuilds. A 24-hour cure makes *ESCOWELD* ® Enhanced Aggregate and *ESCOWELD* ® Super Aggregate Machinery Epoxy Grouting Systems the smart choice for shut-downs and turn-arounds.

Features:

- ***Greater Yield*, resulting in a lower cost per cubic foot.**
- ***Convenient Packaging*, to simplify the mixing of liquid components and provide greater mixing precision.**
- ***Superior Flow Characteristics*, to simplify installation on difficult foundations, assuring proper load-bearing area and reducing the time required for installation.**
- ***Cleans up with water*, a unique feature with obvious advantages over competitive products that require hydrocarbon-cleaning solvents.**
- ***Gentle Exothermic Cure*, provides low-stress results.**

Other unique features and benefits, which have been offered for over 20 years with the original *ESCOWELD* ® 7505E/7530 formulation include:

- ***Excellent Bonding*, to itself without surface preparation to simplify multiple pour projects.**
- ***Wide range of pour depths*, from 1 inch to 18 inches. This simplifies and speeds up any job, which would otherwise have required multiple pours and additional surface preparation.**
- ***24 hour cure*, especially valuable during tight turn-around schedules or emergency repairs.**
- **Exceptional dimensional stability, upon cure.**
- **Excellent resistance, to chemical and physical degradation.**

Mixing & Installation:

Proper mixing of all components is particularly important in obtaining the maximum strength, flow and adhesive characteristics of epoxy grouts.

Mix the liquid components thoroughly and in correct proportions. The pail for *ESCOWELD* ® 7505E Part A has enough room to permit mixing Part B directly in that container. Mix aggregate into a combined liquid components in a mechanical mixer.
Mixing consistency is the key when adding aggregate.

For optimum results, follow the recommendations for site preparations closely, grout storage, grout mixing, grout placement, grout finishing, etc. See the *ESCOWELD* ® Representative in your area for complete details or contact us at www.escoweld.com.

ITW *ESCOWELD* ® Epoxy Grout Systems ♦ Montgomeryville, PA

www.escoweld.com

Rev. 10/03

ESCOWELD®

Extended Aggregate Systems

Typical Physical Properties	Standard Mix	Enhanced Aggregate Mix	Super Aggregate Mix***
Compressive Strength **ASTM C 579** Actual field strength may vary from 10,000 to 14,000 psi depending upon curing and testing conditions.	14,000 psi	14,000 psi	16,000 psi
Yield Per Unit	2.4 cu.ft.**	2.9 cu.ft.**	3.4 cu.ft.**
Tensile Strength	2,100 psi	2,000 psi	2,000 psi
Modulus of Elasticity **ASTM C 579** Modulus of Elasticity as measured by ASTM C579 can vary according to conditions of curing and measuring techniques.	1.8 x 106	1.9 x 10 6	1.9 x 10 6
Coefficient of Linear Expansion **ASTM C 531**	14 x 10 -6	12 x 10 -6	12 x 10 -6
Flexural Strength	4,700 psi	[Not Tested]	[Not Tested]
Adhesive Bond to Concrete **ASTM C 307**	Better than Concrete	Better than Concrete	Better than Concrete
Adhesive Bond to Steel **ASTM C 307+A66**	2,100 psi	[Not Tested]	[Not Tested]
Approximate Working Life **@ 77°F**	2 hours	> 2 hours	> 2 hours
Sealed Shelf Life, Part A & B	2 years	2 years	2 years
Depth of Pour Limitation	18 inches	24 inches*	48 inches*
Cured Density, lbs./cu.ft.	120 lbs./cu.ft.	130 lbs./cu.ft.	136 lbs./cu.ft.
Viscosity, Centipoise @ 77°F			
Epoxy Resin - Part A	1,100 - 1,500 cps	1,100 - 1,500 cps	1,100 - 1,500 cps
Converter - Part B	700 - 1,200 cps	700 - 1,200 cps	700 - 1,200 cps
Flash Point, SETA Closed Cup			
Epoxy Resin - Part A	210°F	210°F	210°F
Converter - Part B	210+B34	210°F	210°F
Dielectric Strength	140 volts/mil	140 volts/mil	140 volts/mil

*** Deeper Pours can be made, but and ESCOWELD® Representative should be contacted for specific instructions.**

****Typical physical properties as expressed for the ESCOWELD® Enhanced Aggregate and Super Aggregate mixtures are approximate based on the averages of multiple field samples tested.**

***** The Super Aggregate System is designed for use as a polymer alternative to concrete when installing new foundations or rebuilding existing only. Contact your ESCOWELD® Representative when considering this system for your next application.**

ESCOWELD®

Extended Aggregate Systems
Mix Data

	Mix Type	Enhanced	Super	Standard
PRC Part #	Component	Quantity	Quantity	Quantity
7575UN	Escoweld 7505E Liquids A&B, 40#/unit	1	1	1
7530A	Escoweld 7530 Engineered Aggregate, 53#/bag	4	4	5
	Coral 1/4 - 3/8 Aggregate, 50#/bag *	2	3	0
	Mixed Yield (Cu. Ft.)**	2.9	3.4	2.4
	Flowability	Good	Fair/Poor	Excellent

NOTES:

*** This product is not available through Philadelphia Resins**

Coral 1/4 - 3/8 Aggregate, 50# bags are available through:

Sheridan White Rock Company
Attention: Pam Vance
P.O. Box 485
Sheridan, AR 72150
Phone: 870-942-2488
Fax: 870-942-7012

Contact Sheridan for cost information

**** Yields on extended aggregate mixtures are approximate and may vary slightly**

ESCOWELD®
Industrial Grouts & Polymers

MIXING INSTRUCTIONS FOR ESCOWELD® 7505E/7530

Standard Mix, Enhanced Mix, and Super Aggregate System

ESCOWELD@ 7505E/7530 can be mixed using three different recipes to create three different products dependent on the application.

Standard Mix	Enhanced Mix	Super Aggregate System
1 unit 7505E Liquid (Parts A & B) 5 bags 7530 Aggregate Yield = 2.4 cubic feet	1 unit 7505E Liquid (Parts A & B) 4 bags 7530 Aggregate 2 bags Coral Pea Gravel Yield == 2.9 cubic feet	1 unit 7505E Liquid (Parts A & B) 4 bags 7530 Aggregate 4 bags Coral Pea Gravel Yield = 3.4 cubic feet
Standard Mix can be poured to depths of 18 inches. For depths greater than 8 inches contact your ESCOWELD Distributor. Enhanced mix may be recommended. When flow ability is a consideration either Standard Mix or Enhanced Mix should be used. Mix parts 7505E Liquid A & B in the 5-gallon bucket provided. Mix for three minutes with a Jiffy mixer blade at 200 - 300 rpm. Pour the mixed 7505E mixture into the mortar mixer and start the paddles. Add the five (53 lb.) bags of7530 Aggregate and mix for two minutes. Empty the mortar mixer into a wheelbarrow and repeat the procedure for additional units.	Enhanced Mix can be poured to depths of 24 inches. For depths greater than 8 inches contact your ESCOWELD Distributor. When flow ability is a consideration either Standard Mix or Enhanced Mix should be used Mix parts 7505E Liquid A & B in the 5-gallon bucket provided. Mix for three minutes with a Jiffy mixer blade at 200 - 300 rpm. Pour the mixed 7505E mixture into the mortar mixer and start the paddles. Add the four (53 lb.) bags of7530 Aggregate and two (50 lb.) bags of Coral Pea Gravel and mix for two minutes. Empty the mortar mixer into a wheelbarrow and repeat the procedure for additional units.	Super Aggregate Mix can be poured to a depth of 48 inches. When flow ability is not a consideration Super Aggregate Mix can be used. Typical applications for Super Aggregate Mix are where depths of over 24 inches are required. Contact your local Distributor before using Super Aggregate Mix. Mix parts 7505E Liquid A & B in the 5-gallon bucket provided. Mix for three minutes with a Jiffy mixer blade at 200 - 300 rpm. Pour the mixed 7505E mixture into the mortar mixer and start the paddles. Add the four (53 lb.) bags of7530 Aggregate and four (50 lb.) bags of Coral Pea Gravel and mix for two minutes. Empty the mortar mixer into a wheelbarrow and repeat the procedure for additional units.

EQUIPMENT FOUNDATION SYSTEMS

ESCOWELD® 7505E/7530

High Strength, Very Fluid, 3-Part Epoxy Grout

Technical Bulletin # 1612D

Product Description

ESCOWELD 7505E/7530 is a highly flowable, epoxy grout system engineered for use with dynamically - operated industrial machinery and equipment where performance and operating reliability are crucial. ESCOWELD grout functions as a critical interface between the equipment and its foundation ensuring proper transference of static and dynamic loads generated by operating equipment to the foundation. This allows the foundation to efficiently absorb and dissipate the loads true to its purpose.

ESCOWELD Epoxy Grout provides proper support for the operating equipment. When coupled with a properly designed anchoring system, ESCOWELD grout maintains critical shaft alignment fundamental for optimum performance of rotating and reciprocating equipment.

ESCOWELD 7505E/7530 also offers improved resistance to many industrial chemicals that would typically destroy conventional cement grouts. A foundation too, is subject to chemical attack. If the foundation mass is reduced by chemical attack, so is its effectiveness as a support and damping mechanism. Using guidelines available from ITW Philadelphia Resins, ESCOWELD grout can also be used to protect concrete foundations from chemical attack that would otherwise deteriorate as a result.

Use & Benefits

The key to the performance of ESCOWELD 7505E/7530 is the combination of ESCOWELD 7505E, a versatile liquid epoxy resin/hardener system, with ESCOWELD 7530, a engineered silica aggregate specifically designed for greater flowability, strength and self-leveling characteristics. Other unique features and benefits that have been offered for over 20 years with ESCOWELD 7505 include:

- Excellent bondability to itself without surface preparation to simplify multiple pour projects.
- Wide range of depth of pour, from 1-1/2” to 18”. This simplifies and speeds up many jobs that would otherwise have required multiple pours and additional surface preparation.
- Cures in 24 hours which is especially valuable during tight turn-around schedules or emergency repairs.
- Exceptional dimensional stability as well as excellent resistance to chemical and physical degradation.
- Negligible shrink on cure.

Design Considerations

For optimum results, follow the recommendations closely for site preparation, grout mixing, grout placement, and grout finishing, etc. found in “ESCOWELD 7505E/7530 Installation Procedures, Bulletin No. 1600.

Application Instructions

The performance of any epoxy machinery grout system depends not only on the engineering and physical characteristics of the cured grout, but also on the quality of the mixing and installation. Proper mixing of all components is particularly important in obtaining the maximum strength and adhesive characteristics of epoxy grouts.

- ESCOWELD 7505E is packaged in a single can. Lower portion contains Epoxy Resin and upper portion contains the converter. Pour entire contents of converter into the Epoxy Resin container and mix properly.
- Mix ESCOWELD 7530 aggregate into combined liquid components in a wheelbarrow or mechanical mixer (mortar/plaster mixer) until all dry particles are wetted out.

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Physical Properties

COMPRESSIVE STRENGTH	14,000 psi (984 kg/cm^2) (Actual field strength may vary, from 10,000 to 14,000 psi depending on curing and testing conditions)	ASTM C-579 MODIFIED
COMPRESSIVE MODULUS OF ELASTICITY	1.8 x 10^6 psi (1.26 x 10^5 kg/cm^2)	ASTM C-579
LINEAR SHRINKAGE	0.036% (.00036 in/in)	ASTM D-2568
COEFFICIENT OF LINEAR THERMAL EXPANSION	26.2 1 x 10^{-6}/ ^{o}C @ 0^{o}C to 60^{o}C (14.6 x 10^{-6} / ^{o}F @ 32^{o}F to 140^{o}F)	ASTM C-531
FLEXURAL STRENGTH	4,700 psi (329 kg/cm^2)	ASTM C-580
FLEXURAL MODULUS OF ELASTICITY	1.8 x IO^6 psi (1.26 x 105 kg/cm^2)	ASTM C-579
TENSILE STRENGTH	2,100 psi (147 kg/cm^2)	ASTM D-307
ADHESIVE BOND TO STEEL	2,100 psi (147 kg/cm^2)	ASTM C-307
IZOD IMPACT STRENGTH		ASTM D-258
FIRE RESISTANCE	Self Extinguishing	ASTM D-637
SERVICE TEMPERATURE	Up to 140^{o}F (60^{o}C)	
SPECIFIC GRAVITY		
DENSITY	125 lbs/cu ft (1948 kg/cu meter)	

Product Information

COVERAGE	2.4 cu.ft. (68 liters)
APPLICATION TEMPERATURE	55^{o}F To 90^{o}F (13^{o}C to 32^{o}C)
CURE TIME (approximate)	12 hours @ 90^{o}F (32^{o}C) 24 hours @ 80^{o}F (27^{o}C) 36 hours @ 70^{o}F (21^{o}C) 38 hours @ 60^{o}F (16^{o}C)
POT LIFE	2 Hours @ 77°F (25°C)
CLEAN UP	Water or IMPAX IXT-59 Solvent
UNIT PACKAGING	Resin (NH): 2.6 gal (9.8 L) in a 5 gal bucket Hardener (NH): 1.2 gal (4.6 L) in a plastic tray inserted into the top of the resin can Aggregate: (5) 53 lb. (24 kg) bags
UNIT WEIGHT	Resin: 25.7 lbs (11.7 kg) Hardener: 10.2 lbs (4.2 kg) Aggregate: 265 lbs (120 kg)
SHIPPING WEIGHT	305 lbs (138 kg)
SHELF LIFE	2 years

Date 09/2005

EQUIPMENT FOUNDATION SYSTEMS

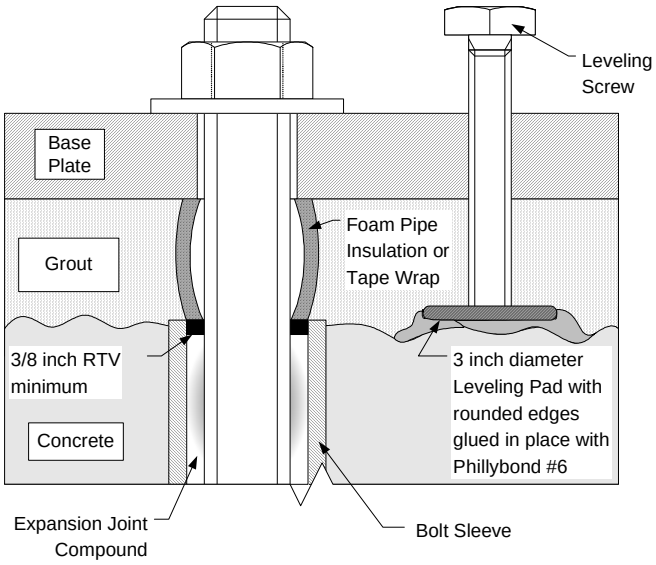
Anchor Bolt & Leveling Screw Installation Detail

For All Epoxy Grout Systems

Technical Bulletin # 1647C

Bulletin Description

This bulletin illustrates the recommended method of protecting an anchor bolt and installing a leveling screw prior to the pouring of Chockfast or Escoweld epoxy grout. The normal sequence of preparation, mixing, and pouring is as follows:



Installation Instructions

1. Remove all laitence and foreign matter from the surface of the concrete by use of a chipping hammer. All areas coming in contact with grout should be roughened.
2. Remove all debris such as concrete chips and all moisture from the bolt sleeve by the use of an air hose.
3. The anchor bolt located within the concrete should be protected by a plastic bolt sleeve in order to prevent the grout from coming in contact with the anchor bolt. This will ensure proper stretch of the bolt.
4. If possible, fill the sleeve with a non-binding material such as Expansion Joint Compound or spray foam insulation. If additional sealing is required, fill the top end of the pipe sleeve with RTV Silicone.
5. Cover the top portion of the anchor bolt with Armaflex Pipe Insulation or wrap with foam-backed tape to prevent it from touching the grout.
6. Sand blast the bottom of the base plate to obtain a 1 to 1 ½ mil profile (SP-6) and coat with ITW Polymer Technologies Rust Inhibitive Primer.
7. Attach a leveling pad to the surface of the concrete foundation using ITW Polymer Technologies Phillybond #6. This pad must be round with rounded edges and must be capable of supporting the load imposed by the leveling screw on the foundation.
8. Set and level the base plate. After leveling, apply paste wax to any areas on the base plate that may get grout dripped on them to make it easier to clean later.

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9. Apply a heavy coat of non-melt grease to all leveling screws both before and after the base plate is aligned.
10. Mix and pour the grout in accordance with “Installation Specification for Pumps and Drivers when Using Epoxy Grouts”.
11. After the grout has hardened, remove the leveling screws and fill the holes with Silicone. If this is not practical back off the leveling screws a minimum of three full turns

Reference

For further design considerations and application details please request the paper titled ***Installation Specification for Pumps and Drivers when Using Epoxy Grouts*** or contact ITW Polymer Technologies' Engineering Services Department.

Date

09/2005

ITW Polymer Technologies

Boletines Technicos / española

Industrial Grouts, Polymers & Foundation Systems

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Boletín Técnico # SP 617N

DESCRIPCIÓN DEL PRODUCTO

EL CHOCKFAST RED ES UN PRODUCTO DE TRES COMPONENTES, DE ELEVADA RESISTENCIA A LA COMPRESIÓN, QUE CONSISTE DE RESINAS EPÓXICAS COMBINADAS CON UN AGREGADO ESPECIALMENTE FORMULADO PARA VACIADOS PROFUNDOS DE MAQUINARIA GRANDE Y PARA SOPORTAR BASES Y PLANCHAS DE METAL EN TODO TIPO DE DISEÑO DE FUNDACIÓN.

EL CHOCKFAST RED MANTIENE UNA ALTA RESISTENCIA A LA COMPRESSION Y A LA TENSIÓN CON UNA RETRACCIÓN VIRTUALMENTE NULA, HACIENDOLO IDEAL PARA LA INSTALCIÓN DE DE MAQUINARIA CRITICAMENTE ALINEADA DENTRO DE TOLERANCIAS MÍNIMAS.

USOS Y BENEFICIOS

EL CHOCKFAST RED TIENE LAS SIGUIENTES VENTAJAS COMPARADO CON MATERIALES CEMENTOSOS CONVENCIONALES:

- INSENSIBLE AL ACEITE
- TIEMPO DE CURA TRES VECES MAS RÁPIDO
- NO SE REQUIERE MEDIR LAS PROPORCIONES DE LOS COMPONENTES AL MEZCLAR
- PUEDE APLICARSE EN MAQUINARIA EN UNA POSICIÓN DE ALINEACIÓN FINAL
- PROPIEDADES FÍSICAS SUPERIORES
- ALTA RESISTENCIA AL IMPACTO
- ALTA RESISTENCIA QUÍMICA
- ALTA ADHESIÓN AL METAL Y AL CONCRETO
- NO AFFECTADO POR LOS CAMBIOS DEL TIEMPO AMBIENTAL
- MANTIENE LAS PROPIEDADES FÍSICAS PROPIAS DEL PRODUCTO
- RESISTENCIA SUPERIOR A LA FATIGA

CONSIDERACIONES DE DISEÑO

EL CHOCKFAST RED ES RAPIDO EN CURACIÓN, COMPARADO CON RELLENOS DE CEMENTO, PERO LA CURACIÓN ES TERMICAMENTE SUAVE. ESTO PERMITE HACER VACIADOS PROFUNDOS SIN CAUSAR RAJADURAS DE PRESIÓN FRECUENTEMENTE ASOCIADAS CON CURAMIENTOS CALIENTES DE VACIADOS EPÓXICOS. EL CHOCKFAST ROJO SE PUDE VACIAR EN ESPESORES MAYORES DE 30mm (1.25”) Y HASTA MAS DE 45cm DE ESPESURA Y 2.2m (7”) DE LARGO.

EL CHOCKFAST RED NO CONTIENE DILUENTES NO REACTIVOS LOS CUALES INTERFIEREN CON EL MECANISMO DE LA CURACIÓN O CAUSAN PÉRDIDA DE MATERIAL DURANTE O DESPUÉS DE LA CURACIÓN. LA MAQUINARIA PUEDE SER COLOCADA EN SU ELEVACIÓN FINAL ANTES DEL VACIADO PORQUE LA RETRACCIÓN DEL MATERIAL ES INSIGNIFICANTE. LOS ALINEAMIENTOS CRÍTICOS SON MANTENIDOS DURANTE LA OPERACIÓN DE LA MAQUINARIA DEBIDO A SU ALTA ESTABILIDAD DIMENSIONAL Y SU ALTA RESISTENCIA A LA VIBRACIÓN Y AL ESCURRIMIENTO PLÁSTICO.

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TRATAMIENTO DEL MATERIAL

EL CHOCKFAST RED SE PUEDE MEZCLAR CON UNA PALA Y CARRETILLA O CON UN PEQUEÑO MEZCLADOR DE MORTERO PORTÁTIL. LA RESINA, EL ENDURECEDOR Y EL AGREGADO SE DEBEN PREACONDICIONAR A 18 - 27°C (65 - 80°F) ANTES DE MEZCLAR. CUANDO SE REQUIERE UNA MEZCLA MAS FLÚIDA SE PUEDE REDUCIR EL CONTENIDO DEL AGREGADO. SIN EMBARGO CUANDOES NECESARIO SOPORTAR CARGAS, UNA REDUCCIÓN MÁXIMA A 3-1/2 BOLSAS SE RECOMIENDA. FAVOR DE CONTACTAR A SU REPRESENTANTE DE CHOCKFAST O A ITW POLYMER TECHNOLOGIES SI MENOS DE 3-1/2 SACOS SON CONSIDERADOS.

PROPIEDADES FÍSICAS

COEFICIENTE TÉRMICO DE EXPANSIÓN LINEAL	20.1 x 10^{-6} °C (11.2 x 10^{-6} °F)	ASTM D-696
MÓDULO O COEFICIENTE DE ELASTICIDAD	140,600 kg/cm^2 (2,000,000 psi)	ASTM C-579
RESISTENCIA A LA COMPRESIÓN	1.072 kg/cm^2 (15,250 psi)	ASTM C-579
TIEMPO DE CURA	54 horas a 16°C (60°F) 36 horas a 21°C (72°F) 24 horas a 27°C (80°F) 18 horas a 32°C (90°F)	
RESISTENCIA AL FUEGO	AUTO EXTINCIÓN	ASTM D-635
RESISTENCIA AL IMPACTO	MAYOR QUE EL CONCRETO	
MERMA LINEAL	NO MEDIBLE	ASTM D-2566
EMPAQUE Y COBERTURA	94 kg (207 lbs) 45.3 litros (1.6 Ft^2)	
VIDA ÚTIL	APROXIMADAMENTE 3 HORAS @ 21°C (70°F)	
VIDA DE ESTANTE	MAS DE UN AÑO EN ALMACENAJE SECO	
GRAVEDAD ESPECÍFICA	2.06	
RESISTENCIA A LA TENSIÓN	133 kg/cm^2 (1,890 psi)	ASTM D-638
PROFUNDIDAD DE VERTIDO	HASTA 46 cm EN UNA SOLA COLADA	

CHOCKFAST® RED SG

VERTIDO FINO - CURA RÁPIDA
RESINA DE ALTA RESISTENCIA

Boletín Técnico # SP 618E

DESCRIPCIÓN DEL PRODUCTO

CHOCKFAST RED SG ES UN COMPUESTO DE TRES COMPONENETES, DE ALTA RESISTENCIA Y DE 100% SÓLIDOS DISEÑADO PARA VERTIDOS FINOS EN TODO TIPO DE MAQUINARIA DONDE EL ESPACIO LIBRE MÍNIMO ES DE 25mm (1”). CHOCKFAST RED SG DEMUESTRA ALTAS PROPIEDADES FÍSICAS Y UNA RETRACCIÓN INSIGNIFICANTE HACIENDOLO IDEAL PARA MAQUINARIA CRÍTICAMENTE ALINEADA DENTRO DE TOLERACIAS MÍNIMAS EN SU POSICIÓN FINAL. COMPRESORES MONTADOS EN PATINES, TURBINAS, BOMBAS, MOTORES Y RIELES DE GRUAS MARINAS SON ALGUNOS DE LOS EQUIPOS TÍPICOS QUE SE INTALAN CON CHOCKFAST RED SG. CUANDO SE USA CHOCKFAST RED SG DEBAJO DE RIELES DE GRUAS SE RECOMIENDA COLOCAR UNA JUNTA DE EXPANSIÓN CADA 3m (10’).

USOS Y BENEFICIOS

CHOCKFAST RED SG TIENE LAS SIGUIENTES VENTAJAS COMPARADO A PRODUCTOS CEMENTOSOS CONVENCIONALES:

- INSENSIBLE AL ACEITE Y EL ATAQUE QUÍMICO
- TIEMPO DE CURA TRES VECES MAS RÁPIDO
- NO REQUIERE MEDIR LAS PROPORCIONES ANTES DE MEZCLAR
- PUEDE APLICARSE EN MAQUINARIA ALINEADA EN POSICIÓN FINAL
- SUPERIORES PROPIEDADES FÍSICAS
- FUERTE ADHESIÓN AL CONCRETO Y AL METAL
- NO ES AFECTADO POR CAMBIOS SEVEROS DEL TIEMPO AMBIENTE
- RESITENCIA SUPERIOR A LA FATIGA

EL CHOCKFAST RED SG NO CONTIENE DILUENTES NO REACTIVOS LOS CUALES INTERFIEREN CON EL MECANISMO DE LA CURACIÓN O CAUSAN PÉRDIDA DE MATERIAL DURANTE O DESPUÉS DE LA CURACIÓN. LA MAQUINARIA PUEDE SER COLOCADA EN SU ELEVACIÓN FINAL ANTES DEL VACIADO PORQUE LA RETRACCIÓN DEL MATERIAL ES INSIGNIFACANTE. LOS ALINEAMIENTOS CRÍTICOS SON MANTENIDOS DURANTE LA OPERACIÓN DE LA MAQUINARIA DEBIDO A SU ALTA ESTABILIDAD DIMENSIONAL Y SU ALTA RESISTENCIA A LA VIBRACIÓN Y AL ESCURRIMIENTO PLÁSTICO.

CONSIDERACIONES DE DISEÑO

PARA CONSIDERACIONES DE DISEÑO O DETALLES CONTACTAR AL DEPARTAMENTO DE INGENIERÍA DE ITW POLYMER TECHNOLOGIES.

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TRATAMIENTO DEL MATERIAL

EL CHOCKFAST RED SG SE PUEDE MEZCLAR CON PALA Y CARRETILLA O EN UN MEZCLADOR PORTÁTIL. MEZCLAR EL ENDURECEDOR CON LA RESINA, COMPLETAMENTE, ANTES DE AÑADIR EL AGGREGADO. CUANDO SE REQUIERE UNA CONSISTENCIA DE ALTA FLUIDEZ SE PUEDE REDUCIR EL AGREGADO DE ACUERDO CON LAS CONDICIONES NECESARIAS. FAVOR DE CONTACTAR A SU REPRESENTANTE DE CHOCKFAST O A ITW POLYMER TECHNOLOGIES CUANDO ES DESEABLE REDUCIR EL AGREGADO.

EL CHOCKFAST RED SG SE CURA RELATIVAMENTE RÁPIDO COMPARADO CON LOS MATERIALES CEMENTOSOS, PERO EXHIBE UNA CURA TÉRMICAMENTE SUAVE. ESTO PERMITE VACIADOS GRUESOS SIN CAUSAR RAJADURAS DE TENSIÓN EXOTERMICA, TÍPICAS DE MATERIALES QUE DESAROLLAN CALOR EXCESIVO DURANTE SU CURA.

NOTA: EL CHOCKFAST RED NORMAL ES DISPONIBLE Y PERMITE VACIADOS DE HASTA 450mm (18”) EN UNA SOLA COLADA PARA LA RECONSTRUCCIÓN DE CONCRETO.

PARA TEMPERATURAS DE 0°C - 15°C (32°F - 60°F)

UN ACELERADOR ES DISPONIBLE PARA USO CON EL CHOCKFAST RED SG CUANDO LA TEMPERATURA AMBIENTAL DE LA FUNDACIÓN DE CONCRETO Y DEL CHOCKFAST RED SG ES DE 0°C (32°F) A 15°C (60°F). EL ACELERADOR ES SUMINISTRADO EN UNA BOTELLA PLÁSTICA DE 0.9L (1 QUART) QUE TIENE UNA SOLA LINEA DE REDUCCIÓN Y ES INVERTIDA PARA FACILITAR SU USO. EL ACELERADOR SE AÑADE A CADA UNIDAD DE CHOCKFAST RED SG IMEDIATAMENTE DESPUÉS QUE EL AGREGADO SE HAYA MEZCLADO CON LOS COMPONENETES LÍQUIDOS (MEZCLADOS DE ANTE MANO) EN UN MEZCLADOR DE MORTERO. PARA TEMPERATURAS AMBIENTALES DE 0°C A 10°C (32 - 50°F) USAR TODO EL MATERIAL EN LA BOTELLA QUE ES EQUIVALENTE A 7.3% DEL PESO NETO DE LA RESINA Y EL ENDURECEDOR.

PARA TEMPERATURAS AMBIENTALES DE 10°C A 15°C (50 - 60°F) VACIAR EL CONTENIDO DE LA BOTELLA HASTA LA LINEA DE REDUCCIÓN CON LA BOTELLA INVERTIDA. ESTA CANTIDAD DE ACELERADOR ES EQUIVALENTE A 5% DEL PESO NETO DE LA RESINA Y EL ENDURECEDOR. LOS SIGUIENTES SON LOS TIEMPOS DE CURA:

- 0°C (32°F) 90 HORAS *
- 5°C (40°F) 48 HORAS *
- 10°C (50°F) 24 HORAS *

* ESTOS TIEMPOS DE CURA REPRESENTAN LA CANTIDAD DE TIEMPO REQUERIDO PARA PRODUCIR UNA RESISTENCIA A LA COMPRESIÓN EN EXCESO DE 700 kg/cm2 (10,000 psi) A LA TEMPERATURA INDICADA. LA MAQUINARIA SE PUEDE ASENTAR Y LOS PERNOS DE ANCLAJE SE PUEDEN TORSIONAR CON VACIADOS DE 30mm A 50mm (1.25” - 2”) DE ESPESOR A LAS TEMPERATURAS INDICADAS ARRIBA. CURA ADICIONAL Y MAYOR RESISTENCIA A LA COMPRESIÓN SE PUEDEN REALIZAR CON TIEMPO, RESULTANDO EN PROPIEDADES FÍSICAS EQUIVALENTES A LAS DE UNA APLICACIÓN NORMAL DEL CHOCKFAST RED SG CURADA A 22C (75F) SIN USO DEL ACELERADOR.

NOTA: EL TIEMPO DE CURA FINAL Y LA FLUIDEZ DEL CHOCKFAST RED SG MEJORAN SI LA TEMPERATURA DEL MATERIAL ES MAS ALTA QUE LAS TEMPERATURAS AMBIENTALES MENCIONADAS ARRIBA, AUNQUE LA TEMPERATURA DEL MATERIAL NO DEBE EXEDER DE 21C (70F) CON EL USO DEL ACELERADOR .

PROPIEDADES FÍSICAS

ADHESIÓN AL CONCRETO	MAYOR QUE EL CONCRETO	
MÓDULO COMPRESIVO DE ELASTICIDAD	138,505 kg/cm^2 (1,970,000 psi)	ASTM C-109
RESISTENCIA A LA COMPRESIÓN	1.230 kg/cm^2 (17,500 psi)	ASTM C-109
COBERTURA	442 cc/kg (13 in^3./lb.)	
TIEMPO DE CURA	24 a 48 horas a 21°C (70°F)	
RESISTENCIA AL FUEGO	AUTO EXTINCIÓN	ASTM D-635
MERMA LINEAL	NO MEDIBLE	ASTM D-2566
EMPAQUE Y	96 kg (211 lbs)	
COBERTURA POR UNIDAD	45.3 litros (1.6 Ft^3)	
EMPAQUE Y COBERTURA POR COMPONENTE	RESINA: 9.05 litros (3 gal. can) ENDURECEDOR: 1.63 litros (1 gal. can) AGREGADO: 4 sacos de 21 kg cada uno (46 lb). ACELERADOR (SI NECESARIO): .9 litros (1 qt.)	
VIDA ÚTIL	UNA HORA @ 21°C (70°F)	
VIDA DE ESTANTE	MAS DE UN AÑO EN ALMACENAJE SECO	
GRAVEDAD ESPECÍFICA	2.24	
RESISTENCIA A LA TENSIÓN	211.3 kg/cm^2 (3,000 psi)	ASTM D-638

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Boletín Técnico # SP 616

DESCRIPCIÓN DEL PRODUCTO

EL CHOCKFAST BLUE ES UN PRODUCTO AUTO NIVELANTE QUE CONSISTE DE DOS COMPONENETES PARA APLICACIONES SEVERAS. ESTE MATERIAL SE USA CON FRECUENCIA PARA REEMPLAZAR PLANCHAS DE ACERO O RIELES Y COMO RECUBRIMIENTO DE CIMENTACIONES CON ALTA RESISTENCIA A TEMPERATURAS ELEVADAS. SUS PROPIEDADES ÚNICAS PERMITEN EL USO DE ESTE MATERIAL DIRECTAMENTE DEBAJO DE LA SUPERFICIE DE MONTAJE DE MAQUINARIA BAJO ALTAS TENSIONES. LAS APLICACIONES TÍPICAS INCLUYEN RELLENOS DEBAJO DE MOTORES DE DIESEL, COMPRESORES, GENERADORES, ENGRANAJES, BOMBAS Y OTROS TIPOS DE EQUIPO PESADO. EL CHOCKFAST BLUE NO ES SUPERADO DEBAJO DE MAQUINARIA RECÍPROCA Y ROTATIVA DADO A SU EXCELEENTE RESISTENCIA AL ESCURRIMIENTO PLÁSTICO, A LA FATIGA Y A LAS FUERZAS DE IMPACTO. ES TAMBIÉN UNA EXCELENTE SUPERFICIE DE APOYO PARA EL CHOCKFAST BLACK.

CONSIDERACIONES DE DISEÑO

EL CHOCKFAST BLUE SE USA NORMALMENTE EN UNA GAMA DE ESPESURA DE 25-38mm (1” A 1-1/2”). SECCIONES MAS GRUESAS SE PUEDEN REALIZAR USANDO TÉCNICAS APROPIADAS. FAVOR DE PONERSE EN CONTACTO CON ITW POLYMER TECHNOLOGIESS PARA INSTRUCCIONES ADICIONALES DE APLICACIÓN.

VERTIDOS LARGOS DEBEN DIVIDIRSE EN SECCIONES DE NO MAS DE 1.1m (3 6”) DE LONGITUD. VERTIDOS MAS LARGOS, MAS GRUESOS O MAS FINOS DE LO NORMAL SE PUEDEN REALIZAR, PERO SE DEBE CONSULTAR A ITW PHILADELPHA RESINS ANTES DE SER CONSIDERADOS. LA VISCOSIDAD AUTO NIVELANTE DEL CHOCKFAST BLUE PERMITE UN 100% DE CONTACTO DE SUPERFICIE. COMO EL CHOCKFAST BLUE EXHIBE UNA RETRACCIÓN INSIGNIFICANTE UNA ALINEACIÓN FINAL SE PUEDE REALIZAR ANTES DEL VERTIDO.

EN TEMPERATURAS ENTRE 49 - 60°C (120 - 140°F) DURANTE LA OPERACIÓN DE LA MAQUINARIA LA CARGA ESTÁTICA SOBRE EL CHOCKFAST BLUE NO DEBE EXCEDER DE 35 kg/cm^2 (500 psi), LA CUAL ES PERFECTAMENTE ADECUADA PARA LA MAYORÍA DE LAS MAQUINARIAS. CUANDO LAS TEMPERATURAS SON DE MENOS DE 49°C (120°F) CARGAS DE HASTA 140 kg/cm^2 (2,000 psi) SON PERMISIBLES PERO NO DEBEN EXCEDER A 85 kg/cm^2 (1,200 psi) SIN CONSULTAR CON ITW POLYMER TECHNOLOGIESS, QUE SIEMPRE ESTÁ DISPONIBLE PARA CONSULTAS SOBRE CUALQUIER APLICACIÓN.

TRATAMIENTO DEL MATERIAL

PREACONDICIONAR LA RESINA Y EL ENDURECEDOR A 21 - 27°C (70 - 80°F) POR 24 HORAS ANTES DE MEZCLAR. EL ENDURECEDOR DEBERÁ AGREGARSE A LA RESINA Y MEZCLADO HASTA QUE UNA TEXTURA Y COLOR HOMOGÉNEO SEAN EVIDENTE. MEZCLAR POR 3-5 MINUTOS CON UN MEZCLADOR ESTILO “KOL” O CON UN MEZCLADOR ESTILO “JIFFY” DE ACERO INOXIDABLE EN UN TALDRO DE VELOCIDAD VARIABLE.

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PROPIEDADES FÍSICAS

COEFICIENTE LINEAL DE EXPANSIÓN TÉRMICA	27.7 x 10^{-6} °C (15.4 x 10^{-6} °F)	ASTM D-696
GAMA DE TEMPERATURA	24°C a 71°C (76°F a 160°F)	
MÓDULO COMPRESIVO ELASTICIDAD	115,300 kg/cm^2 (1,640,000 psi)	ASTM C-109
RESISTENCIA A LA COMPRESIÓN	1,336 kg/cm^2	ASTM C-109
COBERTURA	500 cc/kg 435 m^2 a 30mm (13.8 in^3 /lb) (640in^2 @ 1¼")	
TIEMPO DE CURA	36 horas a 16°C (60°F) 24 horas a 21°C (72°F) 16 horas a 27°C (80°F) 11 horas a 32°C (90°F)	
RESISTENCIA AL INCENDIO	AUTO EXTINCIÓN	ASTM D-635
RESISTENCIA AL IMPACTO	CHOCKFAST BLUE 0.15 Newton m/cm (3.4 in. lbs./in.) CONCRETO 0.2 Newton m/cm (4.6 in. lbs./in.)	
RETRACCIÓN LINEAL	0.0001 mm/mm (0.0001in./in.)	
EMPAQUE	26 kg (58 lbs.) en 5- gal lata 13.1 litros (800 in^3)	
VIDA ÚTIL	35-50 minutos a 21°C (70°F)	
VIDA DE ESTANTE	EXCESO DE UN AÑO EN ALMACENAJE SECO	
GRAVEDAD ESPECÍFICA	2.0	
RESISTENCIA A LA TENSIÓN	140.6 kg/cm^2 (2,000 psi)	ASTM D-638

EQUIPMENT FOUNDATION SYSTEMS

Chockfast®

CHOCKFAST® ORANGE

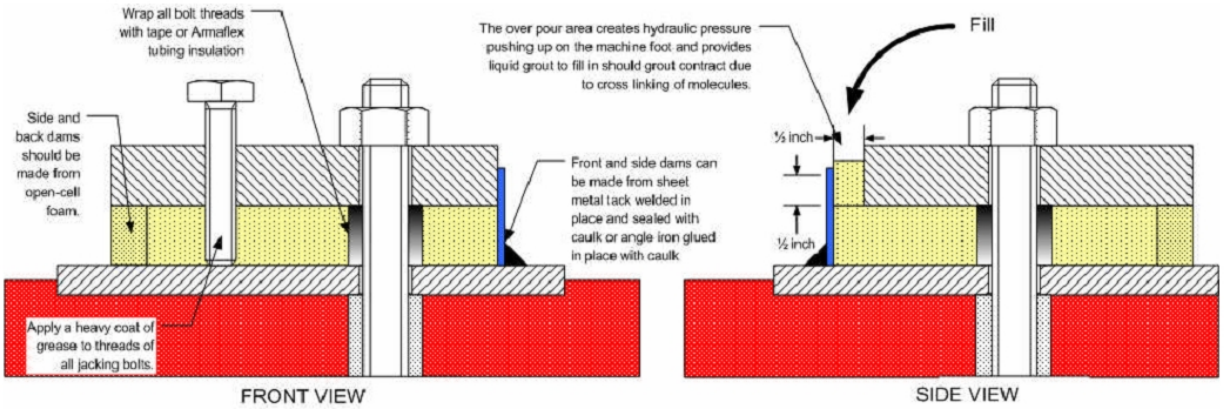
Boletín Técnico # SP 659

DESCRIPCIÓN DEL PRODUCTO

EL CHOCKFAST ORANGE ES UNA FORMULACIÓN DE 100% SÓLIDOS, QUE CONSISTE DE UN COMPUESTO DE VACIADO DE DOS COMPONENTES DE RELLENOS INERTES, DESAROLLADO PARA USO COMO TACO (“CHOCK”) O MATERIAL DE LECHADA EPÓXICA. EL CHOCKFAST ORANGE HA SIDO DISEÑADO PARA RESISTIR AMBIENTES SEVEROS MARINOS E INDUSTRIALES LOS CUALES INVOLUCRAN ALTOS GRADOS DE IMPACTO TÉRMICO Y FÍSICO. EL COMPUESTO NO ENCOJE Y DEMUESTRA ALTA RESITENCIA AL IMPACTO Y A LA COMPRESIÓN. AÑOS DE EXPERIENCIA EN SERVICIO HAN DEMOSTRADO QUE EL CHOCKFAST ORANGE ES UN MÉTODO SUPERIOR Y MAS ECONÓMICO DE ESTABLECER, Y PERMANENTE MANTENER, LA ALINEACIÓN DE EQUIPO DE ALTA PRECISION BAJO CONDICIONES EXTREMAS. EL CHOCKFAST ORANGE ES APROBADO POR LA AGENCIA ESTAUNIDENSE DE EMBARQUES, EL REGISTRO DE LLOYD’S, LA AGENCIA VERITAS, DET NORSKE VERITAS, GERMANISCHER LLOYD Y LA MAYORÍA DE LAS AGENCIAS REGULADORAS IMPORTANTES GLOBALMENTE.

USOS Y BENEFICIOS

EL CHOCKFAST ORANGE HA SIDO DESAROLLADO COMO UN COMPUESTO PARA LECHADA EPÓXICA O TACOS (“CHOCKS”) EN APLICACIONES BAJO MAQUINARIA MARINA DE PROPULSIÓN PRINCIPAL. EL COMPUESTO SE USA BAJO MOTORES DE GAS Y DIESEL, ENGRANAJES DE REDUCCIÓN, GENERADORES, COMPRESORES, BOMBAS, BLOQUES DE APOYO, CARRILES DE GRÚA Y OTRAS NUMEROSAS APLICACIONES. EL MATERIAL NO REQUIERE HERRAMIENTAS O HABILIDADES ESPECIALES COMO EN EL CASO DE APLICACIONES DE TACOS O RESISTENTES DE ACERO. AL VACIAR, EL CHOCKFAST ORANGE, FLUYE FACILMENTE AL ÁREA DEL TACO RELLENANDO FACILMENTE TODOS LOS VACÍOS Y CONFORMÁNDOSE A TODAS LAS IRREGULARIDADES DE LA BASE DEL EQUIPO. ESTO ELIMINA EL AJUSTE MAQUINADO DE LAS FUNDACIONES O LAS BASES DE LOS EQUIPOS PARA OBTENER UN TACO PERFECTAMENTE AJUSTADO.



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PROPIEDADES FÍSICAS

COEFICIENTE LINEAL DE EXPANSIÓN TÉRMICA	0.0002 mm/mm (0.0002 in/in)	ASTM D-2566
VIDA ÚTIL	30 min @ 21°C (70°F)	
RESISTENCIA A LA COMPRESIÓN	1,336 kg/cm^2 (19,000 psi)	ASTM C-109
RESISTENCIA AL CORTE	380 kg/cm^2 (5,400 psi)	
RESISTENCIA A LA TENSIÓN	349 kg/cm^2 (4,9700 psi)	
MÓDULO DE ELASTICIDAD	37,482 kg/cm^2 (533,00 psi)	
TIEMPO DE CURA	48 horas @ 15°C (60°F) 36 horas @ 18°C (65°F) 24 horas @ 21°C (70°F) 18 horas @ 26°C (80°F)	
COBERTURA	1966cc por 3.4kg (120 in^3/ 7.5 lbs.) 4261cc por 6.8kg (260 in^3 / 15 lbs.)	
VIDA DE ESTANTE	Mas de 18 meses	
GRAVEDAD ESPECÍFICA	1.58	

EQUIPMENT FOUNDATION SYSTEMS

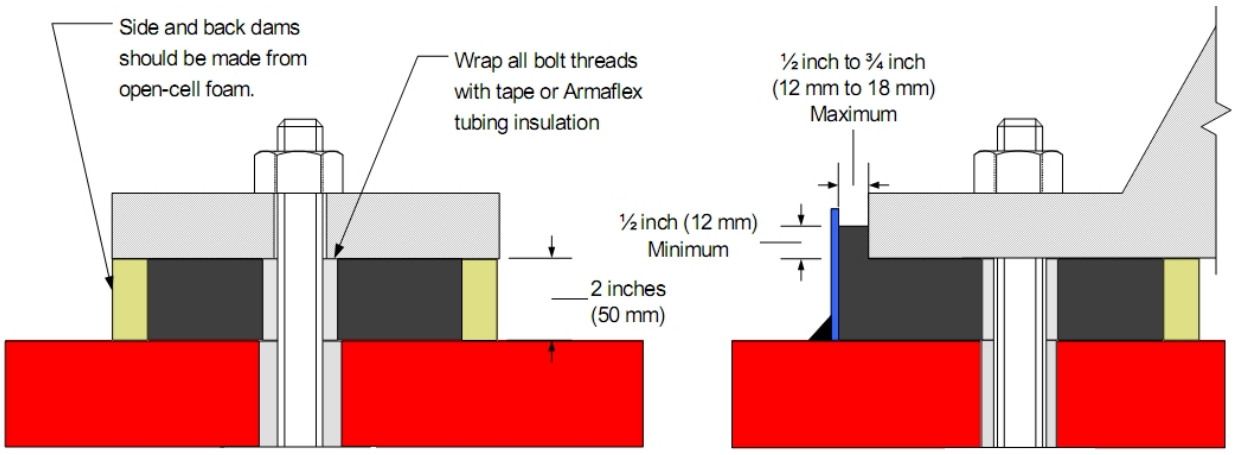
CHOCKFAST® BLACK

Boletín Técnico # SP 666D

DESCRIPCIÓN DEL PRODUCTO

EL CHOCKFAST BLACK ES UNA FORMULACIÓN DE 100% SÓLIDOS QUE CONSISTE DE UN COMPUESTO DE COMPONENTES INERTES, DESAROLLADO PARA USO COMO TACO (“CHOCK”) O MATERIAL DE LECHADA EPÓXICA. ESTE PRODUCTO ÚNICO ES USADO BAJO MOTORES DE DIESEL Y GAS, COMPRESORES, GENERADORES, TURBINAS, MOTORES, BOMBAS Y OTROS DIVERSOS TIPOS DE EQUIPO. EL CHOCKFAST NEGRO ES UN MÉTODO COSTO EFECTIVO PARA MANTENER PERMANENTE LA ALINEACIÓN PRECISA DE EQUIPO CRÍTICO. EL MATERIAL RESISTE AMBIENTES SEVEROS DE ALTO IMPACTO FÍSICO Y TÉRMICO. EL CHOCKFAST NEGRO ES IDEAL PARA USO BAJO MAQUINARIA CALIENTE RECÍPROCA Y ROTATIVA DEBIDO A SU EXCELLENTE RESISTENCIA AL ESCURRIMIENTO PLÁSTICO Y A LA FATIGA EN ALTAS TEMEPRATURAS DE OPERAMIENTO. NO ENCOJE Y TIENE ALTA RESISTENCIA A LA COMPRESIÓN Y AL IMPACTO. PUESTO QUE ESTOS TACOS (“CHOCKS”) DE RESINA EPÓXICA (1) DISMINUYEN LA ACUMULACIÓN DE CALOR EN LAS FUNDACIONES DE HORMIGÓN, (2) ASEGURAN CONTACTO PRECISO, SIN IGUAL, CON LA BASE PLACA Y (3) PROPORCIONA UN ALTO COEFICIENTE DE FRICCIÓN PARA AGUANTAR A LA MÁQUINARIA FIRMENTE DURANTE SU OPERACIÓN. SON IDEALES PARA REDUCIR EL DAÑO A LOS COJINETES Y AL CIGUEÑAL.

EL CHOCKFAST BLACK HA SIDO DISEÑADO COMO MATERIAL DE COLADA GRUESA. UNA PROFUNDIDAD DE 50mm ES LA NORMA. SIN EMBARGO COLADAS MAS FINAS OR GRUESAS SE PUEDEN REALIZAR SATISFACTORIAMENTE. EL TACO (“CHOCK”) DE 50mm (2”) ELEVA AL EQUIPO SOBRE LA FUNDACIÓN SUBYACENTE PERMITIENDO LA CIRCULACIÓN DE AIRE BAJO LA MAQUINARIA REDUCIENDO LA POSIBILIDAD DE ENCORVAMIENTO DE LA FUNDACIÓN. PONERSE EN CONTACTO CON ITW POLYMER TECHNOLOGIES PARA MAS INFORMACIÓN EN CUANTO A VACIADOS DE MENOS DE 32mm (1-1/4”) DE ESPESOR O MAS DE 62mm (2-1/2”) DE GRUESO.



COSTOSO EN DINERO Y TIEMPO. EL EXCELENTE CONTACTO A LA SUPERFICIE Y EL ALTO COEFICIENTE DE FRICCIÓN ENTRE EL CHOCKFAST NEGRO Y LA BASE PLACA DE LA MAQUINARIA ASEGURAN UNA ALINEACIÓN PRECISA Y PERMANENTE LA EXCELENTE FLUIDEZ DEL CHOCKFAST NEGRO PERMITE LLENAR VACÍOS EN EL AREA DEL TACO (“CHOCK”) CONFORMANDOSE, AL MISMO TIEMPO, A TODAS LAS IRREGULARIDADES DE LA SUPERFICIE. ESTO ELIMINA LA NECESIDAD DE MÁQUINAR LA BASE PLACA QUE ES.

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PROPIEDADES FÍSICAS

COEFICIENTE LINEAL DE EXPANSIÓN TÉRMICA	27.0 x 10^{-6} °C (15.0 x 10^{-6} °F)	ASTM D-696
GAMA DE TEMPERATURA	0°C a 60°C (32°F a 140°F)	
MÓDULO DE ELASTICIDAD	5.6 x 10^{4} kg/cm^2	ASTM D-695
RESISTENCIA A LA COMPRESIÓN	1,216 kg/cm^2 (17,300 psi)	ASTM D-695
COBERTURA	4343 cc por 8.6 kg 86860 mm^2 @ 50mm grueso (265 in^3 por 19 lbs) (132 in^2 @ 2" grueso)	
TIEMPO DE CURA	48 horas @ 15°C (60°F) 36 horas @ 18°C (65°F) 24 horas @ 21°C (70°F) 18 horas @ 26°C (80°F)	
DUREZA - BARCOL	55 Cura total	ASTM D-2583
IZOD FUERZA DE IMPACTO	0.23 N. m/cm (5.1 in.lbs./in.)	
MERMA LINEAL	0.00018mm / mm	ASTM D-2566
VIDA ÚTIL	45 min. @ 21°C (70°F)	
RESISTENCIA AL CORTE	350 kg/cm^2 (5,000 psi)	FED-STD-406 (Method 1041)
RESISTENCIA A LA TENSIÓN	204 kg/cm^2 (2,900 psi)	ASTM D-638
VIDA DE ESTANTE	Mas de 18 meses	
GRAVEDAD ESPECÍFICA	1.94	

EQUIPMENT FOUNDATION SYSTEMS

Chockfast®

Boletín Técnico # SP 639A

MANTENIMINETO DE ALINEAMINETO CON TACOS (“CHOCKS”) DE RESINA CHOCKFAST

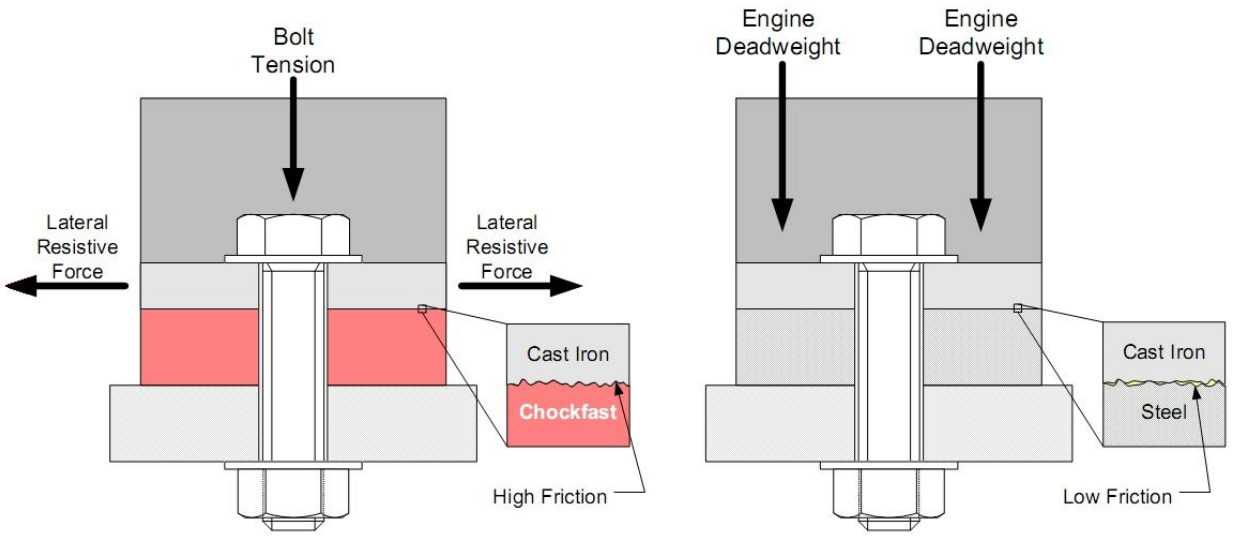
EL MANTENIMIENTO DE LA ALINEACIÓN DEL CIGÜEÑAL EN MAQUINARIA ALTERNATIVA ES DE

IMPORTANCIA CRÍTICA PARA EL OPERADOR DE ESTA. FALTA DE MANTENIMIENTO AUMENTA LA POSIBILIDAD DE FRACTURAS DEL ÁRBOL DEL CIGÜEÑAL, EL GASTO EXCESIVO DE LOS COJINETES Y EL TIEMPO MUERTO ASOCIADO CON ESTOS PROBLEMAS.

CON LOS TACOS (“CHOCKS”) DE RESINA CHOCKFAST, EL MANTENIMINETO DE LA ALINEACIÓN DE LA MAQUINARIA ES SUPERADA DRAMATICAMENTE COMPARADO CON EL USO DE LOS TACOS DE ACERO.

EXISTEN MUCHOS CASOS DE ALINEAMIENTOS SUPERADOS A TRAVÉS DEL USO DE CHOCKFAST COMO UN TACO AJUSTABLE SUBSTITUYENDO TACOS DE ACERO EN MAQUIANARIA DIFICULTOSA.

LA RAZÓN CLAVE PAR EL ÉXITO DE LOS TACOS DE RESINA CHOCKFAST ES QUE ELLOS PRODUCEN UNA RESISTENCIA LATERAL MÁS ALTA A LA DE LOS TACOS DE ACERO BAJO EL ARMAZÓN DE LA MAQUINARIA. EL COEFICIENTE DE FRICCIÓN ENTRE LOS TACOS DE RESINA CHOCKFAST Y EL HIERRO FUNDIDO DEL ARMAZÓN ES DE 0.7 COMPARADO CON 0.15 ENTRE EL ACERO Y EL ARMAZÓN. ESTOS COEFICIENTES HAN SIDO ESTABLECIDOS POR UN FABRICANTE INDEPENDIENTE DE MAQUINARIA DURANTE UN PROGRAMA EXTENSIVO DE PRUEBAS (SULZER BROTHERS - WINTERHUR, SUIZA). LAS CALCULACIONES SIGUIENTES DEMUESTRAN LA RESISTENCIA LATERAL SUPERIOR DERIVADAS DEL USO DE LOS TACOS DE RESINA EPÓXICA.



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EJEMPLO 1: DRESSER CLARK HBAS

SI COMPARAMOS LA FUERZA TOTAL DEL LA RESISTENCIA DISPONIBLE CON LOS TACOS DE RESINA CHOCKFAST PARA UN HBAS CLARK, OBTENEMOS LO SIGUIENTE:

- PESO MUERTO DEL EQUIPO = 170,000 lbs
- TORQUE DE CADA PERNO DE ANCLAJE = 25,560 lbs
- PERNOS DE 1 ½” DE DIAMETRO - 19 PERNOS EN LA ARMADURA

ASUMIR QUE TODA LA CARGA ESTÁ SOBRE 19 TACOS DE RESINA EPÓXICA MIDIENDO 10” POR 10”.

CARGA TOTALNORMAL = PESO MUERTO DEL EQUIPO + TORQUE DE TODOS LOS PERNOS = 170,000 LBS + 19 x 25,560 lbs (655,640 lbs).

FUERZA DE RESISTENCIA TOTAL DE TACOS DE RESINA A LA BASE DEL EQUIPO = COEFICIENTE DE FRICCIÓN DEL CHOCKFAST AL ARMAZÓN DE HIERRO x CARGA TOTAL NORMAL = 0.7 x 655,640 lbs. = 458,948 lbs.

FUERZA DE RESISTENCIA TOTAL DE TACOS DE ACERO A LA BASE DEL EQUIPO = COEFICIENTE DE FRICCIÓN DEL TACO DE ACERO x CARGA TOTAL NORMAL = 0.15 x 655,640 lbs. = 98,346 lbs.

FUERZA DISPONIBLE PAR AYUDAR A MANTENER EL ALINEAMIENTO:

1) CON TACOS DE RESINA CHOCKFAST - 45,948 lbs.
2) CON TACOS DE ACERO - 98,346 lbs.

CHOCKFAST® RED

PROCEDIMIENTOS PARA LA APLICACIÓN DE CHOCKFAST ROJO EN INSTALACIONES EN BOMBAS

SUPERFICIE DE CONCRETO DEBERÁ SER PREPARADA EN LA FORMA SIGUIENTE:

1) PICAR LA SUPERFICIE HASTA DEJAR EXPUESTA LA PIEDRA (AGREGADO) DEL HORMIGÓN.
2) BISELAR TODAS LAS ORILLAS DE LA FUNDACIÓN AL MENOS 20 mm (3/4”) CON UN ÁNGULO DE 45°.
3) LA SUPERFICIE DEBERÁ ESTAR LIBRE DE ACEITE, AGUA, MATERIAL SUELTO Y CUALQUIER OTRO CONTAMINANTE.
4) UTILIZAR COMPRESOR DE AIRE LIBRE DE ACEITE O AGUA, O ASPIRADORA PARA REMOVER POLVO Y CONCRETO SUELTO.
5) EL CONCRETO VIEJO SE DEBE REPICAR HASTA EL PUNTO QUE NO HAYA CONTAMINACIÓN DE ACEITE.
6) TODAS LAS GRIETAS DEBERÁN SER ELIMINADAS O REPARADAS.
7) EL CONCRETO DEBERA SER DE POR LO MENOS 211 kg/cm^2 (3.000 PSI) DE FUERZA COMPRESIVA. COMPROBAR SU RESITENCIA.

SUPERFICIE DE LAS BASE DE LA MAQUINARIA DEBERA SER PREPARADA EN LA FORMA SIGUIENTE:

1) ES PREFERIBLE DESMONTAR EL EQUIPO DE LA BASE PARA HACER TODOS LOS PROCEDIMINETOS.
2) UN AGUJERO DE 10 a 15 cm (4 a 6”) ES NECESARIO PARA CADA COMPARTIMENTO INDIVIDUAL DE LA BASE
3) AÑADIR AGUJEROS DE AIRE EN LAS ESQUINAS DE LOS SOPORTES Y DEBAJO DE DONDE SE VA A MONTAR EL EQUIPO PARA EVITAR VACIOS.
4) REDONDEAR TODAS LAS ESQUINAS AGUDAS QUE HAGAN CONTACTO CON EL EPOXY.
5) SOLDAR UNA TUERCA CERCA DE LOS PERNOS DE ANCLAJE PARA ACOMODAR UN TORNILLO DE NIVELACIÓN.
6) APLICAR CHORRO DE ARENA HASTA QUE EL METAL QUEDE BLANCO O CASI BLANCO.
7) SI EL VACIADO DE CHOCKFAST RED NO SE VA A HACER INMEDIATAMENTE, APLICAR EL ITW RUST INHIBIITIVE PRIMER PARA SELLAR LA BASE CONTRA OXIDACIÓN.
8) ANTES DE HACER EL VERTIDO, HACER UNA LIMPIEZA A LA BASE CON UN SOLVENTE COMO PRT 61.

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PROCEDIMIENTOS PARA LA NIVELACIÓN DE LA BASE DE LA MAQUINARIA USANDO TORNILLOS DE NIVELACIÓN:

1) LOS TORNILLOS DE NIVELACIÓN DEBERÁN DE ESTAR CERCA DE LOS PERNOS DE ANCLAJE

2) LOS TORNILLOS DE NIVELACION DEBERÁN ASENTAR SOBRE PLANCHAS REDONDAS DE ACERO DE APROXIMADAMENTE 7cm (3" DE DIAMETRO).

3) ENVOLVER LA ROSCA DE LOS TORNILLOS DE NIVELACIÓN CON CINTA ADHESIVA PARA DUCTOS PARA FACILITAR SU RETIRO DESPUÉS QUE EL CHOCKFAST RED HAYA ENDURECIDO.

4) NIVELAR DE ACUERDO CON LAS ESPECIFICACIONES DEL FABRICANTE DEL EQUIPO.

PROCEDIMIENTOS PARA MOLDES O ENCOFRADOS:

1) EL MATERIAL DE MOLDE O ENCOFRADO DEBERÁ SER MULTILAMINADO ("PLYWOOD") DE ESPESOR MINIMO DE 20 mm (3/4") P Y AFIANZADO VERTICAL Y HORIZONTALMENTE CON MADEROS DE 2" X 4" O MAS (5 X 10 cm).

2) LOS LADOS DE LAS MADERAS QUE HARAN CONTACTO CON LA RESINA DEBERAN SER BARNIZADOS Y APLICARSELES DOS (2) CAPAS DE CERA EN PASTA (PARA PISOS) O UN EQUIVALENTE PARA PREVENIR QUE LA RESINA SE ADHIERA AL LA MADERA.

3) EL ENCOFRADO DEBERÁ SER A PRUEBA DE FUGA DE LÍQUIDOS. SELLAR LAS FORMAS A LA SUPERFICIE VERTICAL DEL CONCRETO DONDE LAS FORMAS VERTICALES HACEN CONTACTO CON LAS FORMAS. HORIZONTALES Y DONDE LAS FORMAS VERTICALES HACEN CONTACTO CON LA BASE DEL EQUIPO. USAR UN MATERIAL SELLANTE COMO SELLADOR DE SILICÓN. ESTE MATERIAL DEBE CURARSE TOTALMENTE ANTES DE HACER EL VERTIDO DE CHOCKFAST RED. RELLENAR CUALQUIER ESPACIO DONDE SE PUEDA FUGAR EL LÍQUIDO EPÓXICO.

4) LOS MOLDES DEBERAN TENER UN BISEL DE 45° Y 25 mm (1") COLOCADO EN DONDE LAS SUPERFICIES VERTICALES SE JUNTAN CON LAS FORMAS HORIZONTALES.

EL MEZCLADO DEL CHOCKFAST ROJO SE REALIZARÁ DE LA SIGUIENTE MANERA:

1) EL GROUT SE DEBE MEZCLAR EN UN MEZCLADOR DE MORTERO LIMPIO, A BAJA VELOCIDAD (15-20 RPM). SI EL VACIADO ES PEQUEÑO, 5 UNIDADES O MENOS, PODRÁ UTILIZARSE CARRETILLA Y PALA.

2) TODOS LOS COMPONENETES DEL GROUT DEBERÁN SER ALMACENADOS EN UN AMBIENTE LIBRE DE HUMEDAD A TEMPERATURA CONTROLADA DE 21 A 27°C (70- 80°F) DURANTE 24 HORAS ANTES DEL MEZCLADO. SI ESTAS CONDICIONES NO SE PUEDEN SATISFACER, CONTACTE A SU REPRESENTANTE O A ITW POLYMER TECHNOLOGIES.

3) VERTIR EL ENDURECEDOR EN LA LATA DE RESINA Y MEZCLAR POR, NO MENOS DE , TRES MINUTOS CON UN MEZCLADOR DE ACERO INOXIDABLE JIFFY (MARCA REGISTRADA) TAMAÑO MEDIANO, O UN MEZCLADOR EQUIVALENTE. SE REQUIERE UN TALADRO DE 12 mm (1/2”) Y DE VELOCIDAD VARIABLE. MEZCLAR A 200 - 250 RPM.

4) VACÍE LA MEZCLA DE RESINA/ENDURECEDOR EN EL MEZCLADOR Y AÑ ADE EL AGREGADO, UNA BOLSA A LA VEZ, HASTA QUE EL AGREGADO ESTÉ COMPLETAMENTE MOJADO. UTILICE 3 Y 1/2 BOLSAS EN LA PRIMERA TANDA PARA MOJAR EL MEZCLADOR. TODAS LAS OTRAS TANDAS DEBERÁN SER DE CUATRO (4) BOLSAS DE AGREGADO. NUNCA UTILIZE MENOS DE 3 Y 1/2 BOLSAS.

5) EL MATERIAL DEBERÁ SER MEZCLADO SOLO EL TIEMPO NECESARIO PARA MOJAR TODO EL AGREGADO CON LO CUAL MINIMIZAMOS LA INCORPORACIÓN DE AIRE DE FORMA TAL QUE EL PROCESO COMPLETO DEL MEZCLADO DURE NO MAS DE 7 MINUTOS.

6) UNA VEZ QUE SE EMPIEZA EL PROCESO DEL VACIADO DEL MATERIAL NO SE DEBE DE INTERRUMPIR HASTA QUE EL VERTIDO HAYA SIDO COMPLETO.

7) EL TIEMPO DE VIDA UTIL (POT LIFE) DEL GROUT EPÓXICO ES DE APROXIMADAMENTE DOS (2) HORAS A 25°C (77°F) PARA OTRAS TEMPERATURAS CONSULTE A SU REPRESENTANTE LOCAL O A ITW POLYMER TECHNOLOGIES.

VACIADOS DE CHOCKFAST ROJ 0 SE REALIZARÁN DE ACUERDO A LO SIGUIENTE:

1) EL MATERIAL NO SE DEBERÁ VACIAR EN LLUVIA O ALTA HUMEDAD.

2) LA TEMPERATURA DEL CONCRETO DEBERÁ SER UN MÍNIMO DE 15°C Y UN MÁXIMO DE 29°C (60 – 85°F) A MENOS QUE HAYA SIDO APROBADO POR UN TÉCNICO O UN DISTRIBUIDOR DE ITW POLYMER TECHNOLOGIES.

3) SE DEBERÁ LLENAR CADA COMPARTIMIENTO HASTA QUE EL MATERIAL DESBORDE POR LOS AGUJEROS DE ESCAPE DE AIRE.

4) A CONTINUACIÓN ES DESEABLE COLOCAR UN PEDAZO DE 6” A 8” DE TUBERIA PVC SOBRE EL AGUJERO DE VERTIDO Y LLENARLO CON CHOCKFAST ROJO PARA MANTENER UN CABEZAL HIDRÁULICO.

5) ESTE PASO SE REPETIRÁ EN CADA COMPARTIMIENTO PARA FORZAR LA EXPULSIÓN DE TODO EL AIRE DEBAJO DE LA BASE.

6) LA LIMPIEZA DEL MEZCLADOR DE MORTERO Y DE HERRAMIENTAS SE PUEDE HACER CON AGUA INMEDIATAMENTE DESPUÉS DE USADO.

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