



**Polymer
Grouts**

MASTERFLOW® 668B CHOCK GROUT

Epoxy chock grout for mounting equipment

Description

MASTERFLOW® 668B chock grout is a high-performance, three-component, flowable, modified epoxy resin-based grout for applications where conventional epoxy grouts cannot be used. It can be placed 1 to 3 in. (25 to 76 mm) thick on a base grout pour directly to the concrete or steel to steel.

Features/Benefits

- Can conform to worn or irregular surfaces
- Excellent physical properties at high temperatures
- Low creep characteristics through a wide temperature range
- May be incorporated as a replacement for metal chocks
- Can be placed 1 to 3 inches (25 to 76 mm) thick between foundation concrete and steel or steel to steel

Where to Use MASTERFLOW® 668B

- Reciprocating gas compressors
- Steam and gas turbines
- Machinery requiring precision grouting
- Heavy equipment

How to Apply MASTERFLOW® 668B

ChemRx® recommends that the user request the services of the local Representative for a pre-job conference to plan the installation.

Pre-Grout Checklist

THE FOLLOWING CHECKLIST MAY BE USED TO ENSURE ALL NECESSARY STEPS HAVE BEEN TAKEN BEFORE ANY GROUT IS MIXED OR PLACED:

- Store grout at 60 to 80°F (16 to 27°C). Keep aggregate dry.
- Chip foundation to remove laitance.
- Clean prepared metal surfaces of base or plate to be grouted at least 1 in. (25 mm) up from bottom. Minimum surface prep would be wire-brushing or grinding.
- Make sure concrete is oil-free and dry. Remove all dust and contaminants.
- Make sure bolts and sleeves are sealed and dry.
- Provide shade from direct sunlight for at least 24 hours prior to and 48 hours after grouting. Protect work area from inclement weather.
- Heat surrounding areas, if necessary, to obtain baseplate and foundation temperatures above 55°F (13°C) to increase grout workability and reduce cure time.
- Putty around jack screws or wedges.
- Be sure forms are well sealed, "liquid tight."
- Wax forms with at least two heavy coats of paste wax.
- Wax other surfaces that are to be protected from grout spillage.
- Prepare tools for pushing grout.
- Have rags and pails of solvent available.
- Mixer, wheelbarrows, buckets, etc. should be clean and dry.
- Cover the floor around equipment to aid in cleanup.

- Check aggregate by squeezing a handful; if it remains in a ball, it is too wet.
- Follow proper safety precautions when pouring grout.
- Pour the hardener into the pail of grout liquid and stir until well mixed (approximately 3 minutes with paddle, electric or air drill).
- Pour the mixture (catalyzed material) into a mortar or concrete mixer.
- Put the grout aggregate into the mixer gradually and mix until completely wetted out. (Use all aggregate contained in the unit.)

Note:

- (1) Do not add water to any components.
- (2) Do not use wet aggregate.
- (3) Do not alter proportions of materials.

- Pour the grout under the equipment from one side to the other and/or from one end to the other.
- Check frequently for leaks; leaks do not self-seal. If not stopped, leaks will cause voids.
- Forms should be left in place until the grout is hard enough that it cannot flow.
- Jack screws may be loosened and equipment placed in operation when design strength of the grout has been reached.

Establishing a Size

The size or area of chock for equipment support should be determined based on the total compressive load to be transferred. The maximum suggested operating stress for MASTERFLOW® 668B chock grout is 500 psi (3.5 MPa). Allow for possible errors in field forming and area lost for the anchor bolt and jack screw (if used). Other factors such as alignment sensitivity on a given piece of equipment, extent of dynamic loading, and temperature may be reason to decrease design stress.

Chock size should be determined by a mechanical or structural engineer, based on anticipated stresses and grout capabilities.

Preparation

Most chock grout applications involve the placement of epoxy chocks on a base grout pour. Please reference MASTERFLOW® 648 CP Grout Installation Bulletin.

Base grout pour

- The base grout pour should have sufficient time to cure before chock grout application.
- The base pour should be free of any oil, water, or other contamination and be solvent wiped.

Chocking directly to concrete

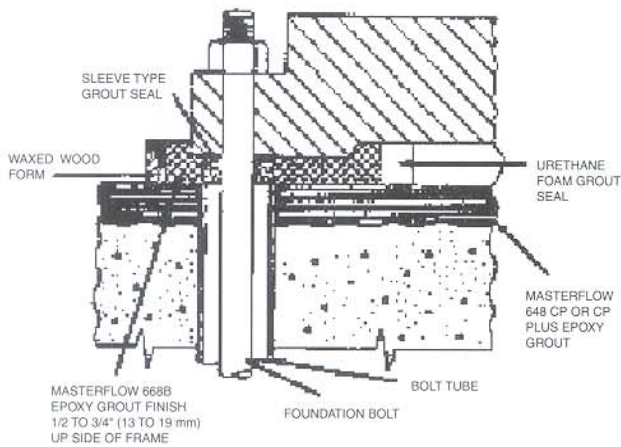
- The concrete should be cured and chipped; recommendations can be found in MASTERFLOW 648 CP Grout Installation Bulletin.
- The concrete should be dry and free of any oil, water, or other contamination.
- The exposed concrete outside the chock area should be sealed with an oil or chemical-resistant coating.

Chocking steel to steel

- Both steel surfaces should be free of oil, water, or other contamination.

- Both steel surfaces should ideally be sandblasted to white metal. Other mechanical methods, such as grinding and sanding, are also effective but do not produce as high a bond strength as sandblasting.
- When a permanent bond is not desired, apply a thin layer of mold release agent to one of the steel surfaces to prevent bond of the grout to the steel.
- The steel, wood, or foam should be coated with paste wax to allow for easier removal.
- Typical epoxy chock thickness should be from 2 to 3 in. (51 to 76 mm). The grout should be poured at least 3/4 in. (19 mm) above the bottom of the base being grouted.
- A 2 in. (51 mm) shoulder should be formed for proper pouring and grout head.
- Tape-back foam should be applied to the vertical edge of the steel frame to allow for thermal growth of the equipment.

Forming Epoxy Chock



Forming

- Open cell urethane foam is generally used under the frame. When using foam, precautions should be taken to properly support the foam. The foam should have a minimum width of 2" (50 mm) and a depth 1 to 2" (25 to 50 mm) larger than required for the chock. The foam will be held in place by compression. The form area outside of the frame (shoulders) should be approximately 2" (50 mm) in width to allow for placement of the grout, and at least 3/4" (19 mm) above the bottom of the base.
- The shoulder pouring area can be formed with foam, steel, or wood. The foam must be supported so the forms do not break during the pouring operation. Contact adhesive and caulk can be used to seal any joints or edges. The forms must be liquid tight.
- Mix grout a minimum of 2 minutes after all components are in the mixer.
- Do not mix more grout than can be placed in approximately 30 minutes.
 - The base grout pour should have sufficient time to cure before chock grout application.
 - The base pour should be free of any oil, water, or other contamination and be solvent wiped.

Grout

- The aggregate must be completely dry. It should be stored under cover and on pallets. Before using, check for moisture by squeezing a handful. The clumping or balling of aggregate when squeezed indicates the presence of moisture. Moist aggregate should not be used.
- In cold weather, store in a warm place for at least 24 hours; 70°F (21°C) is preferred. In hot weather, store in a cool, shaded area.
- MASTERFLOW® 668B Resin and Hardener should be stored at the same temperature as the aggregate. All components should ideally be brought to between 60 and 80°F (16 and 27°C) 24 hours prior to pouring.

Mixing

These proportions are superseded by those on the package label if they differ:

- Full Unit 60.6 lb (27.5 kg) 0.47 ft³ (0.013 m³)
- MASTERFLOW® 668B Grout Resin
One 9.06 lb (4.11 kg) can
- MASTERFLOW® 668B Grout Hardener
One 1.5 lb (0.68 kg) bottle
- MASTERFLOW® 668B Grout Aggregate
One 50 lb (22.7 kg) bag

Mixing Instructions

- Do not add solvent, water, or any other material to the grout.
- Do not alter the resin/hardener proportion.
- Pour the hardener into a pail of grout resin and stir until well mixed (approximately 3 minutes).
- Pour the mixture into the mixer without delay.
- Add the grout aggregate slowly and mix until completely wet (approximately 2 minutes).
- Pour grout into buckets for transporting to the poursite. Remove the grout from the wheelbarrow/mixer within 10 minutes or it will be difficult to place. After the pour is complete, clean the mixer and tools with acetone, MEK, or lacquer thinner. Use caution when using flammable solvents for cleaning.

Working Time

The following chart is a guide for the working time of a fresh grout mix at various ambient temperatures. The working time of a MASTERFLOW® 668B grout mix begins when the hardener is added to the resin:

Temperature°F (°C)	Working Time – Minutes
90 (32)	20 to 30
70 (21)	50 to 60
50 (10)	150 to 180

Do not let mixed resin and hardener stand without adding aggregate. See Safety section.

Grout Placement

Temperature Control

Summer grouting

Avoid high temperatures while grouting in the summer. High ambient temperatures will increase the heat generated during cure and decrease the working time.

If the packaged grout is above 90°F (32°C), chill the sealed pails of grout in a tub of water or cover the pails with water-soaked burlap.

PROVIDE SHADE FROM SUMMER SUNLIGHT FOR AT LEAST 24 HOURS BEFORE AND 48 HOURS AFTER GROUTING.

Winter grouting

Temperatures below 60°F (16°C) make the grout stiff and hard to handle, and cure time is significantly increased. The baseplate and foundation may be much cooler than room temperature. In cold weather, materials should be stored in a warm place. For best handling, the ingredients should be at least 70°F (21°C). When baseplate and the foundation temperature (measured by a contact thermometer) are less than (50°F [10°C]), the grout may be so stiff that it will not readily flow. Flowability is also determined by the length and depth of the grout pour, so field judgment may be necessary to determine if area heating is required.

If heating is required, an enclosure (typical materials are polyethylene or canvas) should be erected around the equipment and foundation to be grouted. Forced air or infrared heaters may be used to obtain the necessary heat to increase the baseplate and foundation temperatures (above 50°F [10°C]). Heat should be applied 1 to 2 days in advance of grouting so uniform baseplate and foundation temperatures are achieved. Avoid exposure to products of combustion when grouting. During grout placement, it is desirable that heat be removed.

Placing the Grout

- When pouring chock grout, it is advisable to pour on one side of formed chock to minimize air entrapment. Trapped air should pass through the open-cell foam, resulting in no air voids. Once the chock

grout has been started on one side, the level of grout should be kept filled above the equipment base.

2 MASTERFLOW® 668B grout is flowable but can be helped by the vertical movement of a banding strip in the open form area. Do not vibrate. Low foundation temperatures decrease flowability.

3 Where grout cannot be adequately worked to fill the grout cavity due to large size or limited space, a head box will greatly assist flow. A sturdy wooden box or sheet metal funnel about 6 to 12 in. (152 to 305 mm) deep may be used.

4 Check for leaks. Leaks do not self-seal. If not stopped, they will cause voids.

5 The grout should always have a minimum of 3/4 in. (19 mm) head in the open form during pouring and cure.

Curing

Jack screws may be removed and equipment placed in operation when design strength of the grout has been achieved.

The grout will not harden below a temperature of approximately 35°F (2°C).

Water will inhibit the cure and strength of the grout, so it must be from rain until it hardens.

Cold Weather Curing

The foundation and the equipment base will probably be cooler than room temperature unless room temperature has been consistent for some time. Thus, the foundation and engine temperatures must be used in estimating cure time.

Cure Time Vs. Temperature

The following table is a guide for final cure time. As mentioned, the base-plate and foundation temperature should be measured since they may be cooler than room temperature.

Compressive Strength (ASTM C 579-B, modified 1 1/2 in. [38 mm] cubes):

All materials conditioned 24 hours at test temperature prior to pouring.

Time (hours)	psi			MPa		
	55°F	73°F	90°F	13°C	23°C	32°C
8	—	14,500	18,600	—	100	128
16	9,500	17,000	19,000	66	117	131
24	14,000	18,000	19,200	97	124	132
48	15,300	18,800	19,200	106	130	132

Temperatures vary so radically, day vs. night, atmospheric vs. metal surface, that field judgment must still be used as the final measure. Cured grout should have a solid, almost metallic feel when struck with a hammer. Be sure to check as close to the base of the equipment as possible.

Finishing and Clean Up

A smooth finish may be obtained by spraying or brushing the surface with mineral spirits. Best results can be obtained by smoothing the surface several times just prior to the hardening of the grout surface. Clean tools and mixer with acetone, ketone solvents or xylene before epoxy cures. Cured material must be removed mechanically.

For Best Performance

- MASTERFLOW® 668B Chock Grout is a three-component epoxy grout formulated for industrial and professional use only and must be kept out of the reach of children. These products contain chemicals that may be COMBUSTIBLE and potentially HARMFUL to your health if not stored and used properly. Hazards can be significantly reduced by observing all precautions found on material safety data sheets, and product labels. Please read this literature carefully before using product.
- Installation procedures contained in this data guide are as specific as possible but cannot cover all variations in field conditions; therefore, supervisors experienced in installing grouting materials may sometimes deviate slightly from the published procedures to fit specific field and service conditions. If additional information on installation procedures is required, please contact ChemRex®

- Make certain the most current version of this data guide is being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by ChemRex® personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Technical Data

Compressive Strength: (ASTM C 579 Method B, Modified) 2 x 2 in. cubes

Test Temperature		24 Hour Room Temperature		16 Hours @ 140°F (60°C) Conditioned 1 Hour @ Test Temperature	
°F	°C	psi	MPa	psi	MPa
73	23	18,300	126	18,900	130
140	60	13,100	90	14,700	101
170	77	13,100	90	13,800	95
235	113	8,000	55	8,400	58

Tensile Strength (ASTM C 307) Test Temperature

°F	°C	psi	MPa
73	23	2,600	17.9

Flexural Strength (ASTM C 580) Test Temperature

°F	°C	psi	MPa
73	23	6,200	43

Modulus of Elasticity (ASTM C 580) Test Temperature

°F	°C	x 10 ⁶ psi	GPa
73	23	2.3	16
110	43	2.2	15
125	52	2.1	15
140	60	2.1	15
155	68	2.0	14
170	77	1.7	12

Creep (Cured per ASTM C 579, Method B) (Test Method 160)

°F	Conditions		MPa	Creep @ 1 Year in./in. (cm/cm)
	psi	°C		
140	600	60	4.1	0.8 x 10 ⁻³ (2.03 x 10 ⁻³)
140	900	60	6.2	1.3 x 10 ⁻³ (3.3 x 10 ⁻³)
140	1,200	60	8.3	1.9 x 10 ⁻³ (4.83 x 10 ⁻³)

Working Time

Temperature		Time
°F	°C	
90	32	1/2 hour
73	23	1 hour
55	13	3 hours

Cure Time To obtain 10,000 psi (69 MPa)

Temperature		Time
°F	°C	
90	32	4 hours
73	23	6 hours
55	13	18 hours

Time (hours)	Cure Rate					
	Compressive strength when cured at:					
	55°F	13°C	73°F	23°C	90°F	32°C
	psi	MPa	psi	MPa	psi	MPa
8	—	—	14,500	100	18,600	128
16	9,500	66	17,000	117	19,000	131
24	14,000	97	18,000	124	19,200	132
48	15,300	106	18,800	130	19,200	132

Coefficient of Thermal Expansion (ASTM C 531)	
73° to 210°F	19 x 10 ⁻⁶ in/in/°F
23° to 100°C	34 x 10 ⁻⁶ cm/cm/°C

Water Absorption (ASTM C 413)	
0.09%	

Bond Strength to Steel - Tension			
°F	°C	psi	MPa
73	23	5,300	36
140	60	3,500	24
170	77	3,200	22
235	113	1,200	8

Bond Strength to Steel - Shear			
°F	°C	psi	MPa
73	23	4,500	31
140	60	3,600	25
170	77	3,600	25
235	113	1,200	8

Density (ASTM C 905)	129 lb./ft. ³ (2,064 kg/m ³)
Specific Gravity	2.06
Tensile Bond Strength to Concrete	350 psi (2.4 MPa)

Flash Points (Pensky-Martens Closed Cup)	
MASTERFLOW® 668B Grout Resin	Above 230°F (110°C)
MASTERFLOW® 668B Grout Hardener	210°F (99°C)

Test results are averages obtained under laboratory conditions. Reasonable variations can be expected.

Order Information

Packaging

MASTERFLOW® 668B CHOCK GROUT

- Full Unit: 60.6 lb. (27.5 kg)

MASTERFLOW® 668B Grout Resin	One 9.06 lb. (4.11 kg) can
MASTERFLOW® 668B Grout Hardener	One 1.50 lb. (0.68 kg) bottle
MASTERFLOW® 668B Grout Aggregate	One 50 lb. (22.7 kg) bag

Color

- Metallic gray

Coverage

- One full unit yields 0.47 ft.³ (0.013 m³).

Caution

MASTERFLOW® 668B CHOCK GROUT Part A

Risks

May cause eye irritation. May cause lung irritation and allergic respiratory reaction. May cause skin irritation. Skin sensitizer.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel ill, seek medical advice.

First Aid

If breathing is difficult, move person to fresh air. If you feel ill, seek medical advice. In case of eye contact, flush immediately with plenty of water for 15 minutes and call a physician. For skin, wash thoroughly with soap. If affected by inhalation of vapor or spray mist, remove to fresh air. Ingestion: Drink two glasses of water, then induce vomiting by taking Ipecac Syrup, salt water or by placing finger at back of throat. DO NOT give anything by mouth to an unconscious person.

For additional information on personal protective equipment, first aid, and emergency procedures, refer to the product Material Safety Data Sheet (MSDS) on the job site or contact the company at the address or phone numbers given below.

Proposition 65

This product does not contain materials listed by the state of California as known to cause cancer, birth defects, or reproductive harm.

VOC Content

This product contains 0 g/L or 0 lbs./gallon.

Caution

MASTERFLOW® 668B CHOCK GROUT Part B

Risks

Lung irritant. May cause allergic respiratory reaction. Causes severe eye and skin burns. Harmful if absorbed through skin. Harmful if swallowed. Refer to Material Safety Data Sheet (MSDS) for effects of repeated overexposure.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Use with adequate ventilation. Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during and after application unless air monitoring demonstrates vapor/mist levels are below applicable limits. Follow respirator manufacturer's directions for respirator use. Do not get in eyes, on skin or on clothing. If you feel ill, seek medical advice. Wash soiled clothing before reuse. The contents of this package must be blended with other components before the product may be used. Any mixture of components will have hazards of both components. Before opening the packages, read all warning labels. Follow all precautions.

First Aid

In case of eye contact, flush immediately with plenty of water for 15 minutes and call a physician. For skin, wash thoroughly with soap. If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician. If affected by inhalation of vapor or spray mist, remove to fresh air. Destroy contaminated shoes. If swallowed, DO NOT induce vomiting. Have victim drink water if conscious. Obtain medical attention immediately.

For additional information on personal protective equipment, first aid, and emergency procedures, refer to the product Material Safety Data Sheet (MSDS) on the job site or contact the company at the address or phone numbers given below.

Proposition 65

This product does not contain materials listed by the state of California as known to cause cancer, birth defects, or reproductive harm.

VOC Content

This product contains 0 g/L or 0 lbs./gallon.

Caution

MASTERFLOW® 668B CHOCK GROUT Part C

Risks

Eye irritant. Skin irritant. Lung irritant. May cause delayed lung injury.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Avoid contact with eyes. Wear suitable protective eyewear. Avoid prolonged or repeated contact with skin. Wear suitable gloves. Wear suitable protective clothing. Do not breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. Wash soiled clothing before reuse.

First Aid

Wash exposed skin with soap and water. Flush eyes with large quantities of water. If breathing is difficult, move person to fresh air.

Waste Disposal Method

This product when discarded or disposed of is not listed as a hazardous waste in federal regulations. Dispose of in a landfill in accordance with local regulations.

For additional information on personal protective equipment, first aid, and emergency procedures, refer to the product Material Safety Data Sheet (MSDS) on the job site or contact the company at the address or phone numbers given below.

Proposition 65

This product contains materials listed by the state of California as known to cause cancer, birth defects, or reproductive harm.

VOC Content

This product contains 0 g/L or 0 lbs./gallon.

*For medical emergencies only, call ChemTrec
(1/800/424-9300).*

Limited Warranty Notice

Every reasonable effort is made to apply ChemRex® exacting standards both in the manufacture of our products and in the information which we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, CHEMREX® MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and CHEMREX® shall have no other liability with respect thereto. Any claim regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the ChemRex® Technical Manager.



MBT mark used under license from MBT Holding AG

ChemRex®

Corporate Office:

889 Valley Park Drive; Shakopee, MN 55379

Authorized Dealer: ROBT. L. ROWAN & ASSOC., INC.
P.O. Box 920760 Houston, TX. 77292-0760
(713) 681-5811 Fax# (713) 681-5815 www.rlrowan.com