

MasterFlow[®] 647

Liquid epoxy grout for pressure or gravity application

FORMERLY MASTERFLOW[®] 647R REPAIR GROUT

PACKAGING

MasterFlow 647 is available as a 2.5 gallon (9.43 liter) unit:

- PART A: 1.5 gallons (5.66 liters) in a 3.5 gallon steel pail.
- PART B: 1.0 gallon (3.77 liters) in a 1 gallon steel can.

YIELD

2.5 gallons yields 575 in³ (0.33 ft³ or 0.009 m³) of mixed product. When estimating project requirements, be sure to account for application variables.

1.15 ft³ (0.03 m³) per full kit of MasterFlow 647 mixed with 120 lbs. of MasterSeal 941 aggregate.

STORAGE

Store in unopened containers at temperatures at or below 80 °F (27 °C) in clean, dry conditions. Freezing temperatures during storage will not harm the product. However, the components should be conditioned to temperatures between 70° and 80 °F (21°–27 °C) prior to use.

SHELF LIFE

2 years (for both part A and part B) when properly stored

VOC CONTENT

0 g/L less water and exempt solvents

DESCRIPTION

MasterFlow 647 grout is a two component, modified epoxy resin-based grout. It is specially formulated injection or gravity feed. The material will penetrate and fill voids, cracks, and fissures. MasterFlow 647 exhibits excellent adhesion to concrete or steel that is properly prepared whether wet, dry or oil-contaminated concrete. It can be used to repair cracks in concrete that contain water. (Not for use in underwater repair.)

PRODUCT HIGHLIGHTS

- Structural grade epoxy that can be used under sustained loads
- Bonds to damp and oil-contaminated concrete
- Chemical resistant for use in a wide range of application environments
- Low viscosity helps to penetrate fine cracks
- Simple mix ratio for ease of use in the field
- Can be extended for wide range of options for crack repair and void filling
- Fast cure rate for rapid return to service
- Accelerator available for increased usage capabilities at low temperatures
- Solvent-free; VOC compliant
- Liquid resin can be stored at low temperature (20 °F) making it easy to transport and store
- MasterFlow 647 can be used as an epoxy mortar when a full unit is mixed with 120 lbs. of oven dried aggregate (MasterSeal 941) or a half unit is mixed with 60 lbs. of MasterSeal 941

APPLICATIONS

- Grouted baseplates under compressors, generators, pumps, cement mills and other vibrating and rotating machinery
- Thin bed repair grout applications
- Repair of cracked concrete
- Precast pile bonding
- Bonding post-tensioned beams
- Epoxy resin binder for epoxy mortar patching of voids

Technical Data

Composition

Masterflow 647R is a two-component, modified epoxy resin-based grout.

Compliances

- ASTM C881, Type I, II and IV, Grade 1 and 2.

Test Data

Time (hrs)	55 °F psi	(13 °C) Mpa	75 °F psi	(24°) Mpa	90 °F psi	32 °C Mpa
Compressive Strength Cure Rate						
8	–	–	800	6	1,100	8
16	–	–	3000	23	7100	49
24	500	3	4900	34	7800	54
48	5300	37	7800	54	9800	68
72	6400	44	9700	67		
96	8800	61				
120	9800	68				
144	10500	72				

Physical Properties

PROPERTY	RESULTS	TEST METHOD
Compressive Strength	10,000 psi (70 MPa)	ASTM C 579
Flexural Properties		ASTM D 790
Strength	9,800 psi (68 MPa)	
Elongation	4.7%	
Coefficient of Thermal Expansion		ASTM C 531
33–74 °F in/in °F (0.6–23 °C cm/cm °C)	46 x 10 ⁻⁶ (83 x 10 ⁻⁶)	
74–110 °F (23–43 °C)	47 x 10 ⁻⁶ (85 x 10 ⁻⁶)	
Density	68.7lbs./ft ³ (1100kg/m ³)	ASTM C 905
Water Absorption	+0.4%	ASTM C 413
Flash Point (Pensky-Martens Closed Cup)		
Resin	230 °F (110 °C)	
Hardener	230 °F (110 °C)	

Epoxy Mortar Physical Properties

PROPERTY	RESULTS	TEST METHOD
Compressive Strength, psi (Mpa)		ASTM C 579 2x2 cubes
1 day	700 (4.8)	
3 day	3,250 (22)	
7 day	12,000 (83)	
28 day	15,000 (103)	
Adsorption, %	0.06%	7 Day I 24 Hour Soak
Shrinkage		ASTM C 157 (1x1x10" Bars)
2 day	-0.0015	
3 day	-0.0022	
7 day	-0.0063	
14 day	-0.0063	
21 day	-0.0063	
28 day	-0.0064	
Tensile Strength, psi (Mpa)		ASTM C 307
7 day	2,100 (14)	
14 day	2,150(15)	
Flexural Strength, psi (Mpa)		ASTM C 348
7 day	4,450 (30)	
14 day	4,500 (31)	

Test results are averages obtained under laboratory conditions using a full unit of MasterFlow 647 mixed with 120 lbs. (54 kg) of MasterSeal 941 aggregate . Expect reasonable variations .

HOW TO APPLY

SURFACE PREPARATION CONCRETE

- Concrete surfaces should be clean, sound and as oil- and water-free as possible. Excessively damaged concrete should be removed.
- When repairing cracks in oil, water or oil-water conditions, the bond strength will be less than for clean, dry surfaces, and will depend upon conditions and methods employed. Field tests should be performed to determine properties for specific applications.

MIXING

- To preserve product properties, do not mix partial units.
- Precondition all components to 70–80 °F (21–27 °C) for 24 hours prior to use.
- Inspect containers prior to opening. Do not use material if containers have been punctured in transportation and storage, or show evidence of leakage.
- Do not add thinners, solvents or water to product.
- Pour the hardener (Part B) into a pail of grout resin (Part A) and stir by hand, using a spatula

or paint stirring paddle, until well mixed to a uniform gray color.

- Alternatively, a slow speed drill and mixing paddle may be used, provided that the mixing does not produce a vortex in the material. Excessive mixing will pull air into the product, which may compromise the finished installation.

MIXING EPOXY MORTAR

To prepare an epoxy mortar, slowly add the recommended amount of oven-dried aggregate (MasterSeal 941) to the already mixed MasterFlow 647 and mix until uniform in consistency.

EQUIPMENT

Masterflow 647 has a volume mixing ratio of 1.5 parts A to 1 part B, and is compatible with plural component equipment. Note that some plural component equipment may create fluctuations in mixing ratio. If using a two-component, side by side injection pump, in which the two components are mixed at the point of discharge, pre-test the mix ratio at the pump hose inlets.

WORKING TIME

Temperature affects the working time and cure time of epoxy grouts. The foundation or concrete being grouted may be cooler than room temperature unless the temperature has been constant for significant periods. Field judgment and professional experience must be used when anticipating working time. Curing time will vary with temperature of the environment, the surfaces being grouted and the temperature of the mixed grout. MasterFlow 647 can be used with an accelerator. Contact Master Builders Solutions Technical Support for additional information.

Working Time

TEMPERATURE, °F (°C)	MINUTES
90 (32)	10–20
75 (24)	20–30
55 (13)	30–40

The above working times assume product has been properly conditioned for cold or hot weather use.

PLACEMENT

PRESSURE GROUTING OF BASE PLATES AT EDGES

This method is used to fill voids under machinery base plates.

1. If the crack or seam at the edge of the base plate is open more than 0.010" (0.25 mm), seal the edge with MasterEmaco ADH 327RS.
2. Drill holes in the exposed edges of the structural member or sole plate.
 - a. If using an injection pump (preferred), install pump manufacturer's preferred ports.
 - b. If using a grease gun, ream out the holes to accommodate 1/8" or 1/4" pipe taps and install grease fittings (zerks).
3. Inject MasterFlow 647 through the fittings/ports into the void until any water or oil has been flushed out and the grout is discharged from the crack.
4. Remove the grease fittings before the grout has set to bleed off any remaining pressure.
5. If grout is not visible or does not flow out of the open fitting hole, repeat the process.
6. If this process does not result in bonding the steel and in-place grout, it is possible that the steel surface was not adequately prepared for grouting prior to the original grout placement.

PRESSURE GROUTING OF HOLLOW BASE PLATES

1. If sounding reveals the presence of voids between the baseplate and installed machinery grout (polymer or cementitious), use this method to grout the voids.
2. Drill holes for ports or zerk fittings and as vents. Typical tapped hole sizes are 1/8" or 1/4". Locate holes within 12 inches of one another, on center.
3. Start injection at one end of void and pump until grout is discharged from adjacent holes.
 - a. Move to the nearest hole where grout has appeared. Continue to inject grout using the new location. Continue this process until all air is vented and all voids filled.
 - b. Remove ports or fittings and check to assure that no settlement or seepage occurred.
 - c. If settlement or seepage has occurred, repeat previous steps.

SMALL REPAIRS

1. Small repairs (i.e. < 10 ft² / 1 m²) should be prepared according to ICRI Guideline no. 310.2R to permit proper bond.
2. Ensure substrate appears dry
3. Apply mixed mortar into area to be repaired. Trowel to desired finish with a steel trowel.
4. Allow repair to air cure.

CLEANUP

Uncured epoxy may be removed from tools and equipment using soap and water or a citrus degreaser. Cured material must be removed mechanically.

FOR BEST PERFORMANCE

- Do not add solvent, water, or any other material to the grout.
- Do not alter the resin or hardener proportions
- Contact your local representative for a pre-job conference to plan the installation.
- Application temperature range is from 50 to 105 °F (10 to 41 °C). Please note that above 90 °F (32 °C), working time will be significantly reduced.
- Neat epoxy binder should not be applied greater than 1/4" (6 mm) in thickness. If greater thickness is required, contact Master Builders Solutions Technical Service.
- For professional use only; not for sale to or use by the general public.
- Make certain the most current versions of product data sheet and SDS are being used; visit www.master-builders-solutions.com/en-us to verify the most current versions.
- Proper application is the responsibility of the user. Field visits by Master Builders Solutions personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

HEALTH, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.com/en-us, e-mailing your request to mbsbcst@mbcc-group.com or calling 1(800)433-9517. Use only as directed.

IN CASE OF EMERGENCY: Call CHEMTEL +1 (800) 255-3924 or if outside the US or Canada, +1 (813) 248-0585.

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