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Technical Data Guide

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MasterFlow 649 Installation Guide

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Epoxy
Grouting

MasterFlow® 649

High-strength, high-temperature, high-flow epoxy grout

FORMERLY MASTERFLOW 648 CP

PACKAGING AND YIELD

Available in 2 packaging configurations:

- 57.4 lb unit (0.43 ft³ [0.012 m³])
- 5.6 lb (2.5kg) pail Part A (Resin)
- 1.87 lb (0.85kg) bottle Part B (Hardener)
- 50 lb (22.7kg) bag Part C (Aggregate)

230 lb unit (1.73 ft³ [0.049 m³])

- 22.3 lb (10.1kg) pail Part A
 - 7.6 lb (3.4kg) bottle Part B
 - 4 x 50 lb (22.7kg) bags Part C
- All components packaged separately.

May be ordered as a 3-bag high-flow unit, which will yield 1.35 ft³ (0.038 m³). When estimating project requirements, be sure to account for application variables.

STORAGE

Store in unopened containers at 60 to 80°F (16 to 27° C) in clean, dry conditions.

SHELF LIFE

1.5 years (for both resin and hardener) when properly stored

VOC CONTENT

0 g/L less water and exempt solvents

DESCRIPTION

MasterFlow 649 grout is a high-performance epoxy grouting material for support of heavy equipment. It ensures the proper transmission of static and dynamic loads to the equipment foundation.

PRODUCT HIGHLIGHTS

- High early and ultimate strengths with low creep for rapid turnaround
- Superior physical properties at high temperatures increases the range of in-service temperatures
- Excellent bearing area for even load distribution
- Good chemical resistance
- Resists impact and dampens torque
- Durable bond to concrete and steel optimizes load transfer
- Meets the requirements of American Petroleum Institute (API); API Standard 610 and API Recommended Practice 686 for rotating equipment

APPLICATIONS

- Precision alignment of compressors, generators, pumps and electric motors
- Pour-back grouting for post-tensioning cables
- Crane rail grouting
- Grouting of crusher ball mills, slab tables and other equipment subject to high torque, impact and vibration
- Grouting of wind turbine tower bases
- Grouting of anchors, bars and dowels

HOW TO APPLY

DO NOT INSTALL THIS PRODUCT WITHOUT READING AND REFERENCING THE COMPANION MASTERFLOW 649 INSTALLATION GUIDE.

MIXING

1. Aggregate must be completely dry.
2. Precondition all components to 70oF (21oC) for 24 hours before using.
3. 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 amber color.
4. Pour the mixed liquids into a horizontal shaft mortar mixer or a Kol type mixer without delay.
5. Add the grout aggregate, one bag at a time, and mix only until aggregate is completely wetted out to avoid air entrapment. Start the mixer just prior to adding the last bag of aggregate. Caution: Always add aggregate to the mixer after the premixed liquids have been poured in.
6. Pour the grout into a wheelbarrow or buckets for transporting to pour-site. Remove it from the wheelbarrow within 15 minutes.
7. After the pour is complete, remove uncured epoxy from the mixer, wheelbarrow and tools with soap and water or a citrus degreaser. Cured material must be removed mechanically.

Technical Data

Composition

MasterFlow 649 grout is three-component modified epoxy-resin-based grout.

Test Data

PROPERTY	RESULTS			TEST METHOD
Compressive strength , psi (MPa), when cured at: Cure rate, filled 6.25 : 1				2 by 2" cubes ASTM C 579 modified,
Hours	55° F (13° C)	73° F (23° C)	90° F (32° C)	
8	—	700 (5)	9,400 (65)	
16	—	7,000 (48)	13,700 (96)	
24	1,300 (9)	11,500 (81)	16,000 (112)	
48	9,400 (65)	16,400 (115)	18,500 (130)	
72	13,900 (96)	17,100 (118)	19,000 (134)	
96	16,700 (115)	18,000 (124)	20,000 (141)	
Tensile strength , psi (MPa), filled 6.25 : 1				ASTM C 307
Modulus of elasticity , psi (GPa)				ASTM C 580
Test Temp ° F (° C)	5.75	Fill Ratios 6.25	6.75	
76 (24)	2.5 x 10 ⁶ (18)	2.5 x 10 ⁶ (18)	2.6 x 10 ⁶ (18)	
110 (43)	2.1 x 10 ⁶ (15)	2.3 x 10 ⁶ (16)	2.3 x 10 ⁶ (16)	
125 (52)	2.0 x 10 ⁶ (14)	2.1 x 10 ⁶ (15)	2.1 x 10 ⁶ (15)	
140 (60)	1.6 x 10 ⁶ (11)	1.7 x 10 ⁶ (12)	1.8 x 10 ⁶ (12)	
155 (68)	0.7 x 10 ⁶ (5)	0.7 x 10 ⁶ (5)	0.9 x 10 ⁶ (6)	
Flexural strength , psi (MPa), filled 6.25 : 1, cured 7 days at 73° F (23° C) ° F (° C)				ASTM C 580
76 (24)	4,600 (32)			
140 (60)	4,200 (29)			
170 (77)	2,100 (15)			
Creep , in/in				Test Method STS 22.2
	Over 24 hours	2.8 x 10 ⁻³		
	Over 1 year	3.7 x 10 ⁻³		
	Over 10 years	4.0 x 10 ⁻³		
Shrinkage , unrestrained linear, in/in, filled 6.25:1				ASTM C 531
Coefficient of thermal expansion , in/in/° F (cm/cm/° C), filled 6.25 : 1				ASTM C 531
31 – 74° F (0 – 23° C)		11.8 x 10 ⁻⁶ (21.2 x 10 ⁻⁶)		
74 – 110° F (23 – 43° C)		13.0 x 10 ⁻⁶ (23.4 x 10 ⁻⁶)		
74 – 210° F (23 – 99° C)		21.8 x 10 ⁻⁶ (39.2 x 10 ⁻⁶)		
Water absorption , %, filled 6.25 : 1				ASTM C 413
Bond strength to steel , tension, psi (MPa)				Michigan DOT
73° F (23° C)		3,100 (21)		
140° F (60° C)		2,000 (14)		
Bond strength to steel , shear, psi (MPa)				Michigan DOT
73° F (23° C)		5,000 (35)		
140° F (60° C)		2,000 (14)		
Density , lb/ft ³ (kg/m ³)				ASTM C 905
Filled 5.75 : 1		129 (2,064)		
Filled 6.25 : 1		131 (2,096)		
Filled 6.75 : 1		133 (2,128)		
Volume per unit , filled 6.75 : 1				1.73 ft ³ (0.049 m ³)
Impact strength				Better than concrete
Abrasion resistance				Better than concrete

Test results are averages obtained under laboratory conditions. Expect reasonable variations.

Materials Removed or Added

TEMPERATURE ° F (° C)	THIN POURS OR LONG FLOW DISTANCES UNDER EQUIPMENT	STANDARD POURS	THICK POURS, OPEN AREAS, OR SHORT FLOW DISTANCES
Above 90 (32)	—	—	1/2 – 1 bag (Add 3.8 L)
70 – 90 (21 – 32)	Up to 1/2 bag	—	1/2 bag
50 – 70 (10 – 21)	1/2 to 1 bag	1/2 bag	1/2 bag

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.
- For guidelines on specific anchor-bolt applications, contact Technical Service.
- Always use a head box when placing less than 1" (25 mm) depths.
- Substrate temperature must be greater than 50° F (10° C).
- Cold material will exhibit decreased flowability and reduced strength development.
- Minimum placement thickness is 1/2" (13 mm). Consult your BASF representative before placing lifts more than 6" (152 mm) in depth.
- Chamfering the concrete edge helps reduce thermal cracking. Following proper installation procedures also reduces the potential for cracking.
- 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; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF 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.basf.us, e-mailing your request to basfbscst@basf.com or calling 1(800)433-9517. Use only as directed.

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

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