BUILDING TRUST

PRODUCT DATA SHEET

SikaFlow®-648

(formerly MFlow 648)

HIGH-STRENGTH, HIGH-FLOW, CHEMICAL RESISTANT EPOXY GROUT

DESCRIPTION

SikaFlow®-648 is a three-component epoxy resin-based precision grout used to secure critical equipment for proper alignment and transmission of static and dynamic loads. With carefully balanced physical properties and excellent resistance to chemical attack, elevated service temperatures, vibration and torque, SikaFlow®-648 is formulated for easy installation, with good flow characteristics suitable for pouring or pumping in thicknesses from 10 mm up to 150 mm, low dust generation and soap and water clean-up. SikaFlow®-648 is available in all regions of the world, supported by trained sales and technical personnel with experience in the specification and installation of epoxy grouts on every continent.

USES

SikaFlow®-648 is used for assembling and fixing of the following items:

- Industrial turbines, generators and compressors
- Very large reciprocating compressors
- Machine bases, base plates for light and heavy machinery.
- Rolling, stamping, grinding, drawing and finishing mills.
- Forging hammers.
- Rail tracks base plate, crane rails.
- Paper machine sole plates.
- Bridge bearings
- Machinery and equipment requiring high strength maximum bearing.

CHARACTERISTICS / ADVANTAGES

- High early & ultimate strengths for rapid turnaround
- Low creep maintains equipment alignment
- Retains physical properties at elevated temperatures increasing the service range
- Low-dusting for added worker comfort and safety
- Very low shrinkage for full baseplate contact and load transfer
- Excellent flowability with high bearing area for even load distribution
- Variable fill ratio for desired flowability
- Excellent adhesion to steel and concrete for optimum load transfer and vibration dampening
- High chemical resistance enables use in challenging environments
- Excellent freeze/thaw resistance for equipment in low temperature service environments
- Resists water and chloride intrusion for use in wet and aggressive environments
- Resists impact and dampens torque to protect equipment and extend service life
- Extended working time
- Pumpable for maximum productivity on large grout installations
- Durable bond to concrete and steel optimizes load transfer
- Meets the requirements of EN 1504-6
- Can be applied in thickness from 10 to 150 mm
- Globally available for consistent project results.

PRODUCT INFORMATION

Chemical base	Epoxy resin, selected fillers and aggregates

Packaging

	Flowable	Fluid
Component A+B+C	26.075 Kg	20.375 Kg
Component A	2.57 Kg Container	2.57 Kg Container
Component B	0.805 Kg Container	0.805 Kg Container
Component C	22.7 Kg Bag	17.0 Kg Bag

Appearance / Colour	Dark Grey	
Shelf life	12 months if stored at below mentioned storage conditions.	
Storage conditions	Store at ambient temperatures, out of direct sunlight, in cool, dry warehouse conditions and clear of the ground on pallets protected from rainfall prior to application. The resin parts need to be protected from frost!	
Density	Flowable ~ 2.3kg/l Fluid ~ 2.1kg/l	(ASTM C 905) (ASTM C 905)

TECHNICAL INFORMATION

Compressive strength	**Flowable** ≥75 N/mm² (1day at 25°C) ≥100 N/mm² (7days at 25°C) **Fluid** ≥70 N/mm² (1day at 25°C) ≥100 N/mm² (7days at 25°C)	(ASTM C 579, Method B) (ASTM C 579, Method B)
Modulus of elasticity in compression	≥ 15000 N/mm² (filling ratio 1/6.7) ≥ 12000 N/mm² (filling ratio 1/5.0)	(EN 13412)
Effective Bearing Area	> 85 %	(ASTM C1339)
Flexural strength	≥ 28 N/mm² at 25°C, 7Day (Flowable/Fluid)	(ASTM C 580)
Tensile strength	≥ 13 N/mm² at 25°C, 7Day (Flowable/Fluid)	(ASTM C 307)
Pull-out bond strength	> 2.5 N/mm² (at 30°C, 7 Day)	(EN 1542)
Shrinkage	Flowable ≈ 0.016 % Fluid ≤ 0.04 %	(ASTM C 531)
Creep	Flowable = 4 ~ 5 x10^{-3} @ 60°C, 28 days (mm/mm) at 4.2 MPa Fluid = 5 ~ 6 x10^{-3}	(ASTM C 1181)
Tensile adhesion strength	Adhesion to concrete: ≥ 3.0 N/mm² (7 days) Adhesion to steel: ≥ 10.0 N/mm² (1 day)	(EN 1542) (EN 12188)
Coefficient of thermal expansion	Flowable = 2 ~ 3 ×10^{-5} Fluid = 3 ~ 4 ×10^{-5}	(ASTM C 531)
Reaction to fire	Class Efl No ignition	(EN 13501-1) (EN ISO 11925-2)
Freeze thaw de-icing salt resistance	Adhesion to concrete after freeze-thaw: ≥ 2.0 N/mm² (28 days) (50 cycles with salt)	(EN 13687-1)
Glass transition temperature	+80°C	(EN 12614)
Heat deflection temperature	+64°C	(ASTM D648)

APPLICATION INFORMATION

Mixing ratio	Flowable = Component A : B : C = 2.57 : 0.805 : 22.7 by weight Fluid = Component A : B : C = 2.57 : 0.805 : 17.0 by weight
Layer thickness	Minimum grout depth: 10 mm Maximum grout depth: 150 mm
Peak Exotherm	43 °C (internal method)
Ambient air temperature	+10 °C min. / +30 °C max.
Dew point	Substrate temperature during application must be at least 3 °C above dew point to avoid condensation.
Substrate temperature	+10 °C min. / +30 °C max.
Pot life	≥45 minutes at 30°C
Open time	The following chart is a guide for the working time of a SikaFlow®-648 grout at various ambient temperatures. +10 °C: 120 - 150 minutes +21 °C: 90 - 120 minutes +30 °: 50 - 60 minutes The open time begins when the resin and hardener are mixed. It is shorter at high temperatures and longer at low temperatures. The larger the quantity mixed, the shorter the pot life. To obtain longer workability at high temperatures, the mixed grout may be divided into portions. Another method is to chill components A+B and C before mixing them (i.e. only when application temperatures are above +20 °C).
Curing time	Full cure is reached in 7days after the application (at 23 ºC).

BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

FURTHER DOCUMENTS

HANDLING AND TRANSPORT Usual preventive measures for the handling of chemical products should be observed when using this product, for example do not eat, smoke or drink while working and wash hands when taking a break or when the job is completed. Specific safety information referring the handling and transport of this product can be found in the Material Safety Data Sheet. For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted. Disposal of product and its container should be carried out according to the local legislation in force. Responsibility for this lies with the final owner of the product.

ECOLOGY, HEALTH AND SAFETY

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in this product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w).

APPLICATION INSTRUCTIONS

NOTES ON INSTALLATION

- Do not apply at temperatures below +10ºC nor above +30ºC.
- Do not add solvent, water, or any other material to the grout.
- Do not alter the resin or hardener proportions.
- Cold material will exhibit decreased flowability and delayed strength development.
- Chamfering the concrete edge helps reduce thermal cracking. Following proper installation procedures also reduces the potential for cracking.
- Severe chemical attack may lead to discolouration of SikaFlow®-648. This is however no sign of physical weakening of the product.
- In case of thicker applications and complex geometries consult your local Sika representative.

SUBSTRATE PREPARATION

The concrete should be free of frost, curing membranes, waterproofing treatments, oil stains, laitance, friable material and dust. The concrete surfaces should be chipped and if there is a water leakage it must be drained or properly plugged. Surfaces should be dry. Particular attention should be paid to bolt holes to ensure that these are dry. Use vacuum and/or oil free compressed air to remove free standing water. The concrete areas to be grouted should not be primed or sealed. Base plates, bolts, etc. must be clean (SA 2½) and free of oil, grease and paint etc. to obtain proper adhesion. Set and align equipment. If shims are to be removed after the grout has set, then lightly grease them for easy removal. Priming the metal surfaces is only required when a long delay between cleaning and grouting will allow corrosion and contamination. A head box should be installed with the formwork to ease the pour and flow of the mixed grout:

Ensure formwork is secure and watertight to prevent movement and leaking during the placing and curing of the grout. The area should be free of excessive vibration. Shut down adjacent machinery until the grout has hardened. In hot weather, base plates and foundations must be shaded from direct sunlight. Bags and buckets of grout should be stored in the shade prior to use. In cold weather, the temperature of base plates and foundations should be raised to over +10°C

MIXING

The fill ratio is the weight of the aggregate to combined resin and hardener components. SikaFlow®-648 is designed to be utilised at a variable fill ratio (resin / aggregate) from the standard 1/6.72 ratio to as low as 1/5.0 (hi-flow version).
SikaFlow®-648 maintains high bearing area when fill ratios are decreased. In addition, physical properties including high temperature performance are maintained.
Add all the contents of the hardener container to the resin part and mix thoroughly for at least 3 minutes. Transfer to a mechanical mixer. Add the aggregate, mixing thoroughly until a uniform consistency is obtained. At low temperatures (+10°C) the flow characteristics of SikaFlow®-648 will be reduced and installation times increased.

APPLICATION

Lengths of metal strapping laid in the formwork prior to placing may be necessary to assist grout flow over large areas and in compacting and eliminating air pockets. Have sufficient manpower, materials and tools to make mixing and placing rapid and continuous. Where grout must flow some distance, make the initial batch slightly more fluid or flowable than required; this lubricates the surfaces and avoids blockage of the grout that follows. The grout shall be poured continuously and from one side only, to avoid entrapment of air while grouting. Maintain a constant hydrostatic head, preferably of at least 15 cm. On the side where the grout has been poured, allow 10 cm clearance between the side of the form and the base plate of the machine. On the opposite side allow 5-10 cm clearance between the formwork and the base plate. Due to differences in temperature between the grout under the base plate, and exposed shoulders that are subject to more rapid temperature changes, debonding and / or cracking can occur. Avoid shoulders wherever possible. If shoulders are required, they should be firmly anchored with reinforcing to the substrate to prevent debonding.
Make sure grout fills the entire space to be grouted and remains in contact with the plate throughout the entire grouting placement. Note: Do not use vibrator for placing the grout!

CLEANING OF TOOLS

After the pour is complete, remove uncured epoxy from the mixer, wheelbarrow and tools with soap and water or a citrus degreaser. Cured material can only be removed mechanically.

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product’s suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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