BUILDING TRUST

PRODUCT DATA SHEET

SikaGrout®-928

(formerly MFlow 928)

LOW DUST, HIGH-PRECISION MINERAL-AGGREGATE GROUT WITH EXTENDED WORKING TIME

PRODUCT DESCRIPTION

SikaGrout®-928 grout is a hydraulic cement-based mineral aggregate non-shrink grout with extended working time. It is ideally suited for grouting machines or plates requiring precision load-bearing support. It can be placed from fluid to damp pack over a temperature range of 45 to 90 °F (7 to 32 °C).

USES

- Grouting of equipment, such as compressors and generators, pump bases and drive motors, tank bases, and conveyors.
- Grouting anchor bolts, rebar, and dowel rods
- Grouting of precast wall panels, beams, columns, curtain walls, concrete systems, and other structural and non-structural building components
- Repairing concrete, including grouting voids and rock pockets

Substrates

- Concrete

CHARACTERISTICS / ADVANTAGES

- Meets the requirements of ASTM C1107 and US Army Corps of Engineers CRD C621 (Grades B and C) at a fluid consistency over a 30-minute working time
- Low-dusting for added worker comfort and safety
- NSF/ANSI 61 Std for use with potable water
- Pumpable
- Extended working time
- Can be mixed at a wide range of consistencies
- Freeze/thaw resistant making it suitable for exterior applications
- Hardens free of bleeding, segregation, or settlement shrinkage to provide maximum effective bearing area for optimum load transfer
- Contains high-quality, well-graded quartz aggregate for optimum strength and workability
- Sulfate resistant for marine, wastewater, and other sulfate-containing environments

APPROVALS / STANDARDS

- ASTM C 1107 and CRD 621, Grades B and C, requirements at a fluid consistency over a temperature range of 40–90 °F (4–32 °C)
- NSF/ANSI 61 Std for use with potable water

PRODUCT INFORMATION

Chemical Base	SikaGrout®-928 is a hydraulic cement-based mineral-aggregate grout.
Packaging	55 lb (25 kg) polyethylene-lined bags 3,300 lb (1,500 kg) bulk bags
Shelf Life	55 LB BAG: 1 year when properly stored 3,300 LB BULK BAG: 3 months when properly stored
Storage Conditions	Store in unopened containers in cool, clean, dry conditions

TECHNICAL INFORMATION

Specific Advice

Dust Reduction

SikaGrout®-928 vs Control	50%	(DIN55992-2)

Testing

Jobsite Testing

If strength tests must be made at the jobsite, use 2” (51 mm) metal cube molds as specified by ASTM C 942 and the ASTM C 1107 modification of ASTM C 109. DO NOT use cylinder molds. Control field and laboratory tests on the basis of desired placement consistency rather than strictly on water content.

Compressive Strength

	Plastic[1]	Consistency Flowable[2]	Fluid[3]	(ASTM C 942) according to ASTM C 1107 of ASTM C 109
1 day	4,500 psi (31 MPa)	4,000 psi (28 MPa)	3,500 psi (24 MPa)	
3 days	6,000 psi (41 MPa)	5,000 psi (34 MPa)	4,500 psi (31 MPa)	
7 days	7,500 psi (52 MPa)	6,700 psi (46 MPa)	6,500 psi (45 MPa)	
28 days	9,000 psi (62 MPa)	8,000 psi (55 MPa)	7,500 psi (52 MPa)	

1. 100–125% flow on flow table per ASTM C 230
2. 125–145% flow on flow table per ASTM C 230
3. 25 to 30 seconds through flow cone per ASTM C 939

Modulus of Elasticity in Compression

3 days	2.82 x 10^6 psi (1.94 x 10^4 MPa)	(ASTM C 469, modified) Test conducted at a fluid consistency
7 days	3.02 x 10^6 psi (2.08 x 10^4 MPa)	
28 days	3.24 x 10^6 psi (2.23 x 10^4 MPa)	

Flexural Strength

3 days	1,000 psi (6.9 MPa)	(ASTM C 78) Test conducted at a fluid consistency
7 days	1,050 psi (7.2 MPa)	
28 days	1,150 psi (7.9 MPa)	

Tensile Strength

3 days	490 psi (3.4 MPa)	(ASTM C 190) Test conducted at a fluid consistency
7 days	500 psi (3.4 MPa)	
28 days	500 psi (3.4 MPa)	

Tensile Strength

Ultimate Tensile Strength and Bond Stress

Diameter	Depth	Tensile Strength	Bond Stress	(ASTM E 488, tests*)
5/8 in (15.9 mm)	4 in (101.6 mm)	23,500 in (10,575 mm)	2,991 in (20.3 mm)	
3/4 in (19.1 mm)	5 in (127.0 mm)	30,900 in (13,905 mm)	2,623 in (18.1 mm)	
1 in (25.4 mm)	6.75 in (171.5 mm)	65,500 in (29,475 mm)	3,090 in (21.3 mm)	

*Average of 5 tests in ≥ 4,000 psi (27.6 MPa) concrete, using 125 ksi threaded rod in 2” (51 mm) diameter, damp, core-drilled holes.

Notes

1. Grout was mixed to a fluid consistency.
2. Recommended design stress: 2,275 psi (15.7 MPa).

3. For more detailed information regarding anchor bolt applications, contact Technical Service.
4. Tensile tests with headed fasteners were governed by concrete failure.

Shear Strength

Punching Shear Strength
3 by 3 by 11" (76 by 76 by 279 mm) beam

3 days	2,200 psi (15.2 MPa)	(Sika Method)
7 days	2,260 psi (15.6 MPa)	
28 days	2,650 psi (18.3 MPa)	

Shrinkage

Volume change (ASTM C 1090)

	% Change	% Requirement of ASTM C 1107
1 day	> 0	0.0 – 0.30
3 days	0.04	0.0 – 0.30
14 days	0.05	0.0 – 0.30
28 days	0.06	0.0 – 0.30

Coefficient of Thermal Expansion

6.5 x 10^{-6} in/in/°F (11.7 x 10^{-6} cm/cm/°C) (ASTM C 531)
Test conducted at a fluid consistency

Freeze-Thaw Stability

Resistance to Rapid Freezing and Thawing
Durability Factor > 90% 300 Cycles (ASTM C 666, Procedure A)

Splitting tensile strength

3 days	575 psi (4.0 MPa)	(ASTM C 496)
7 days	630 psi (4.3 MPa)	Test conducted at a fluid consistency
28 days	675 psi (4.7 MPa)	

APPLICATION INFORMATION

Coverage

One 55 lb (25 kg) bag of SikaGrout®-928 grout mixed with 10.5 lbs (4.8 kg) or 1.26 gallons (4.8 L) of water (fluid consistency) provides approximately 0.50 ft3 (0.014 m3) of grout. Note: The water requirement may vary due to mixing efficiency, temperature, and other variables.

Set Time (ASTM C 191)

	Plastic[1]	Consistency Flowable[2]	Fluid[3]
Initial set	2:30 hr:min	3:00 hr:min	4:30 hr:min
Final set	4:00 hr:min	5:00 hr:min	6:00 hr:min

1. 100–125% flow on flow table per ASTM C 230
2. 125–145% flow on flow table per ASTM C 230
3. 25 to 30 seconds through flow cone per ASTM C 939

Curing Conditions

Cure all exposed grout with an approved membrane curing compound compliant with ASTM C 309 or preferably ASTM C 1315. Apply curing compound immediately after the wet rags are removed to minimize potential moisture loss.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

APPLICATION INSTRUCTIONS

NOTES ON INSTALLATION

Forming

1. Forms should be liquid tight and nonabsorbent. Seal forms with putty, sealant, caulk or polyurethane foam. Use sufficient bracing to prevent the grout from leaking or moving.
2. Moderately sized equipment should utilize a head box to enhance the grout placement.
3. Side and end forms should be a minimum 1" (25 mm) distant horizontally from the equipment to be grouted to permit expulsion of air and any remaining saturation water as the grout is placed.
4. Leave a minimum of 2" between the bearing plate and the form to allow for ease of placement.
5. Eliminate large, non-supported grout areas wherever possible.
6. Extend forms a minimum of 1" (25 mm) higher than the bottom of the equipment being grouted.
7. Expansion joints may be necessary. Consult your local Sika field representative for suggestions and recommendations.

Temperature

1. The ambient and initial temperature of the grout should be in the range of 45 to 90 °F (7 to 32 °C) for both mixing and placing. For precision grouting, store and mix grout to produce the desired mixed-grout temperature. If bagged material is hot, use cold water, and if bagged material is cold, use warm water to achieve a mixed-product temperature as close to 70 °F (21 °C) as possible.
2. If temperature extremes are anticipated or special placement procedures are planned, contact your local Sika representative for assistance. 3. When grouting at minimum temperatures, see that the foundation, plate, and grout temperatures do not fall below 40 °F (7 °C) until after final set. Protect the grout from freezing (32 °F or 0 °C) until it has attained a compressive strength of 3,000 psi (21 MPa) in accordance with ASTM C 109.

Recommended Temperature Guidelines for Precision Grouting

	Minimum °F (°C)	Preferred °F (°C)	Maximum °F (°C)
Foundation and plates	45 (7)	50–80 (10–27)	90 (32)
Mixing water	45 (7)	50–80 (10–27)	90 (32)
Grout at mixed and placed temp.	45 (7)	50–90 (10–32)	90 (32)

SURFACE PREPARATION

1. Steel surfaces must be free of dirt, oil, grease, or other contaminants.
2. The surface to be grouted must be clean, SSD, strong, and roughened to a CSP of 5–9 following ICRI Guideline 310.2 to permit proper bond.
3. When dynamic, shear or tensile forces are anticipated, concrete surfaces should be chipped with a “chisel-point” hammer, to a roughness of (plus or minus) 3⁄8" (10 mm). Verify the absence of bruising following ICRI Guideline 210.3.
4. Concrete surfaces should be saturated (ponded) with clean water for 24 hours just before grouting.
5. All freestanding water must be removed from the foundation and bolt holes immediately before grouting.
6. Anchor bolt holes must be grouted and sufficiently set before the major portion of the grout is placed.
7. Shade the foundation from sunlight 24 hours before and 24 hours after grouting.

MIXING

By using the minimum amount of water to provide the desired workability, maximum strength will be achieved. Whenever possible, mix the grout with a mortar mixer or an electric drill with a paddle such as ICRI 320.5 type A, D, E, F, G or H. Put the measured amount of potable water into the mixer, add grout, then mix till a uniform consistency is attained. Do not use water in an amount or a temperature that will cause bleeding or segregation. Note: The water requirement may vary due to mixing efficiency, temperature, and other variables.

1.Place estimated water (use potable water only) into the mixer, then slowly add the grout. For a fluid consistency, start with 9 lbs (4 kg) (1.1 gallon [4.2L]) per 55 lb bag.
2.The water demand will depend on mixing efficiency, material, and ambient-temperature conditions. Adjust the water to achieve the desired flow. Recommended flow is 25–30 seconds using the ASTM C 939 Flow-Cone Method. Use the minimum amount of water required to achieve the necessary placement consistency.
3.Moderately sized batches of grout are best mixed in one or more clean mortar mixers. For large batches, use ready-mix trucks and 3,300 lb (1,500 kg) bags for maximum efficiency and economy.
4.Mix grout between 3 and 5 minutes after all material and water is in the mixer until a homogenous consistency is achieved. Use mechanical mixer only.
5.Do not mix more grout than can be placed in approximately 30 minutes.
6.Transport by wheelbarrow or buckets or pump to the equipment being grouted. Minimize the transporting distance.
7.Do not retemper grout by adding water and remixing after it stiffens.
8.Do not add plasticizers, accelerators, retarders, or other additives.
9.For placements greater than 6" (152 mm) in depth, product should be extended with aggregate. Aggregate extension is dependent upon the grout type, placement, application requirements, and is typically required for placement depths beyond the limitation of the neat

material. The aggregate should be washed, graded, saturated, surface-dry (SSD), high-density, free from deleterious materials, and comply with the requirements of ASTM C 33. Consult Sika Technical Service for additional guidance.

APPLICATION

Placement

1. Always place grout from only one side of the equipment to prevent air or water entrapment beneath the equipment. Place SikaGrout®-928 in a continuous pour. Discard grout that becomes unworkable. Make sure that the material fills the entire space being grouted and that it remains in contact with plate throughout the grouting process.
2. Immediately after placement, trim the surfaces with a trowel and cover the exposed grout with clean wet rags (not burlap). Keep rags moist until grout surface is ready for finishing or until final set.
3.The grout should offer stiff resistance to penetration with a pointed mason's trowel before the grout forms are removed or excessive grout is cut back. After removing the damp rags, immediately coat with a recommended curing compound compliant with ASTM C 309 or preferably ASTM C 1315.
4.Do not vibrate grout. Use steel straps inserted under the plate to help move the grout. 5.Minimum placement thickness is 1" (25 mm). Consult your Sika representative before placing lifts more than 6" (152 mm) in depth.

CLEANING

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 Safety Data Sheet (SDS) on the job site or contact the company at the address or phone numbers given below

OTHER RESTRICTIONS

LEGAL DISCLAIMER

- **KEEP CONTAINER TIGHTLY CLOSED**
- **KEEP OUT OF REACH OF CHILDREN**
- **NOT FOR INTERNAL CONSUMPTION**
- **FOR INDUSTRIAL USE ONLY**
- **FOR PROFESSIONAL USE ONLY**

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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