BUILDING TRUST
CONSTRUIRE LA CONFIANCE

PRODUCT DATA SHEET

SikaGrout®-928

(formerly MFlow 928)

Low dust, high-precision mineral-aggregate cementitious 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 7 to 32 °C (45 to 90 °F).

WHERE TO USE

- 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

- Low-dusting for added worker comfort and safety
- 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 / CERTIFICATES

- ASTM C1107 and CRD 621, Grades B and C, requirements at a fluid consistency over a temperature range of 4 to 32 °C (40 to 90 °F)
- NSF/ANSI 61 Std for use with potable water
- 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

PRODUCT INFORMATION

Composition / Manufacturing	SikaGrout®-928 is a hydraulic cement-based mineral-aggregate grout
Packaging	25 kg (55 lb) polyethylene-lined bags
Shelf Life	12 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)

Shore A Hardness

Jobsite Testing

If strength tests must be made at the jobsite, use 51 mm (2 in) metal cube molds as specified by ASTM C942 and the ASTM C1107 modification of ASTM C109. 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

(ASTM C942) according to ASTM C1107 of ASTM C109

	Plastic[1]	Consistency Flowable[2]	Fluid[3]
1 day	31 MPa (4500 psi)	28 MPa (4000 psi)	24 MPa (3500 psi)
3 days	41 MPa (6000 psi)	34 MPa (5000 psi)	31 MPa (4500 psi)
7 days	52 MPa (7500 psi)	46 MPa (6700 psi)	45 MPa (6500 psi)
28 days	62 MPa (9000 psi)	55 MPa (8000 psi)	52 MPa (7500 psi)

1. 100–125 % flow on flow table per ASTM C230
2. 125–145 % flow on flow table per ASTM C230
3. 25 to 30 seconds through flow cone per ASTM C939

Modulus of Elasticity in Compression

(ASTM C469, modified) Test conducted at a fluid consistency

3 days	19.4 GPa (2.82 x 10^6 psi)
7 days	20.8 GPa (3.02 x 10^6 psi)
28 days	22.3 GPa (3.24 x 10^6 psi)

Tensile Strength in Flexure

(ASTM C78) Test conducted at a fluid consistency

3 days	6.9 MPa (1000 psi)
7 days	7.2 MPa (1050 psi)
28 days	7.9 MPa (1150 psi)

Tensile Strength

(ASTM C190) Test conducted at a fluid consistency

3 days	3.4 MPa (490 psi)
7 days	3.4 MPa (500 psi)
28 days	3.4 MPa (500 psi)

Ultimate Tensile Strength and Bond Stress

(ASTM E488, tests*)

Diameter	Depth	Tensile Strength	Bond Stress
15.9 mm (5/8 in)	101.6 mm (4 in)	10,575 kg (23,500 lb)	20.3 MPa (2991 psi)
19.1 mm (3/4 in)	127.0 mm (5 in)	13,905 kg (30,900 lb)	18.1 MPa (2623 psi)
25.4 mm (1 in)	171.5 mm (6.75 in)	29,475 kg (65,500 lb)	21.3 MPa (3090 psi)

*Average of 5 tests in ≥ 27.6 MPa (4000 psi) concrete, using 125 ksi threaded rod in 51 mm (2”) diameter, damp, core-drilled holes.

Notes

1. Grout was mixed to a fluid consistency.
2. Recommended design stress: 15.7 MPa (2275 psi).
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

76 mm x 76 mm x 279 mm (3 in x 3 in x 11 in) beam

	3 days	15.2 MPa (2200 psi)	(Sika Method)
	7 days	15.6 MPa (2260 psi)	
	28 days	18.3 MPa (2650 psi)	

Shrinkage

Volume change (ASTM C1090)

	% Change	% Requirement of ASTM C1107
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

11.7 x 10^{-6} cm/cm/°C (6.5 x 10^{-6} in/in/°F) (ASTM C531)
Test conducted at a fluid consistency

Freeze thaw resistance

Durability Factor > 90 % 300 Cycles (ASTM C666, Procedure A)

Splitting Tensile Strength (ASTM C496)
Test conducted at a fluid consistency

3 days	4.0 MPa (575 psi)
7 days	4.3 MPa (630 psi)
28 days	4.3 MPa (675 psi)

APPLICATION INFORMATION

Consumption

One 25 kg (55 lb) bag of SikaGrout®-928 grout mixed with 4.8 kg (10.5 lb) or 4.8 L (1.26 US gal) of water (fluid consistency) provides approximately 0.014 m^3 (0.50 ft^3) of grout.
Note: The water requirement may vary due to mixing efficiency, temperature, and other variables.

Setting Time (ASTM C191)

	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 C230
2. 125–145 % flow on flow table per ASTM C230
3. 25 to 30 seconds through flow cone per ASTM C939

Curing Conditions

Cure all exposed grout with an approved membrane curing compound compliant with ASTM C309 or preferably ASTM C1315. Apply curing compound immediately after the wet rags are removed to minimize potential moisture loss.

BASIS OF PRODUCT DATA

Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.

LIMITATIONS

The user is responsible for the proper use of the product. Site visits by Sika personnel are for the sole purpose of providing technical recommendations and are in no way intended to supervise or control the quality of work on site.

ENVIRONMENT, HEALTH & SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

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 25 mm (1 in) 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 50 mm (2 in) 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 25 mm (1 in) 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 7 to 32 °C (45 to 90 °F) 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 21 °C (70 °F) 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 7 °C (40 °F) until after final set. Protect the grout from freezing 0 °C (32 °F) until it has attained a compressive strength of 21 MPa (3000 psi) in accordance with ASTM C109.

Recommended Temperature Guidelines for Precision Grouting

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

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) 10 mm (3/8 in). 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 4 kg (9 lb) (4.2 L [1.1 US gal]) per 25 kg (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 C939 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.
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 152 mm (6 in) 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 C33. 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 C309 or preferably ASTM C1315.
4. Do not vibrate grout. Use steel straps inserted under the plate to help move the grout.
5. Minimum placement thickness is 25 mm (1 in). Consult your Sika representative before placing lifts more than 152 mm (6 in) in depth.

CLEANING

Clean tools and equipment with clean water immediately after use. Once hardened, the 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

Sika Canada Inc.
Head Office
601, avenue Delmar
Pointe-Claire, Quebec
H9R 4A9
1-800-933-SIKA
www.sika.ca

Other locations
Boisbriand (Quebec)
Brantford; Cambridge;
Sudbury; Toronto (Ontario)
Edmonton (Alberta)
Surrey (British Columbia)