

**DESCRIPTION:** MICROSIL® ANCHOR GROUT is an unsanded, Portland cement-based, expanding grout containing silica fume (microsilica), fly ash, and other carefully selected additives. MICROSIL® ANCHOR GROUT gains strength quickly and resists water washout, making it ideal for anchoring tendons, cables and bolts into soil or rock media. MICROSIL® ANCHOR GROUT meets the requirements of ASTM C 1107 classification "C" for dimensional stability.

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**USES:** MICROSIL® ANCHOR GROUT can be used for most grouted anchor requirements, including:

1. Rock bolts or soil anchors in tunnel support systems.
  2. Earth tie-backs for excavation or slope stabilization.
  3. Cable bolting.
  4. Soil or rock tendons used for anchoring piles or foundation structures.
  5. Infill of pipe piles.
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**ADVANTAGES:**

1. **HIGH EARLY STRENGTH:** MICROSIL® ANCHOR GROUT has superior early strength gain compared to Type HE grouts, allowing early tensioning of anchors. It has comparable strength gain to high alumina grouts, but does not experience strength regression.
2. **RESISTANCE TO WATER WASHOUT:** MICROSIL® ANCHOR GROUT has excellent cohesive properties. It resists washout or dilution by water and thus can be used in wet ground conditions and still retain its excellent physical properties.
3. **REDUCES GROUT TAKES:** MICROSIL® ANCHOR GROUT has thixotropic properties when mixed to a w/cm of 0.27 or less. It pumps easily yet it tends to gel after placement or pumping. This gelling action prevents the loss of grout in porous or fractured geology.
4. **COLD WEATHER PERFORMANCE:** When cold weather grouting standards are followed, MICROSIL® ANCHOR GROUT can achieve excellent physical properties in temperatures down to 5 °C (41 °F).
5. **FREEZE/THAW DURABILITY:** MICROSIL® ANCHOR GROUT exhibits excellent freeze/thaw resistance as demonstrated by ASTM C 666 testing.
6. **SUPERIOR BOND:** MICROSIL® ANCHOR GROUT at one day achieves 90% greater tensile bond to rebar than a Type GU cement grout.
7. **NON-CORROSIVE:** MICROSIL® ANCHOR GROUT meets the requirements of CSA A23.1-00 Section 25.5.3.7 of "Cement Grout for Bonded Tendons" which sets limits on the concentration of corrosive inducing chemicals in a Portland cement grout.

# MICROSIL<sup>®</sup> ANCHOR GROUT

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## PROCEDURES:

1. Mix MICROSIL<sup>®</sup> ANCHOR GROUT to the consistency required for placement. MICROSIL<sup>®</sup> ANCHOR GROUT's thixotropic properties at a pumpable consistency make the grout appear thick and cohesive when in fact it is quite pumpable.

<u>CONSISTENCY</u>	<u>W/CM</u>	<u>RECOMMENDED MAX. WATER/30 kg (66 lb)</u>
Pumpable	0.27	8.2 litres (2.1 US gal)
Flowable	0.31	9.3 litres (2.5 US gal)

Over-watering will result in reduced compressive strengths and inferior physical properties.

2. Introduce potable water into the high shear mixer, and then add MICROSIL<sup>®</sup> ANCHOR GROUT while operating at medium speed. Consistency may vary due to type of mixer used, RPM of mixer and condition of mixer paddle.
3. Mix at high speed for a minimum of five minutes. Mortar style mixers are not recommended for this purpose.
4. Decrease mixer speed to low and continue mixing while placing or pumping the grout. The grout's pot life is approximately one hour.

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## ON SITE TESTING:

1. Follow the procedures outlined in CSA A23.2-B, Viscosity, Bleeding, Expansion and Compressive Strength of Flowable Grout. In the USA, follow ASTM C 1107 modified.
2. Take the sample from the mixer discharge. Sample shall be taken between the 10% and 90% points of discharge.
3. Minimum sample size must be 5 litres (5.28 USQ).
4. Cubes must be restrained with a "C" clamp and stored for the first 24 hrs. indoors at a temperature between 15° C (59 ° F) and 25° C (77 ° F).
5. At 24 hrs. remove cubes from mold and store in water between 15° C (59 ° F) and 25° C (77 ° F) continuously until transported to the lab for testing.
6. Standard moist cure the cubes in the lab until the cubes are tested.

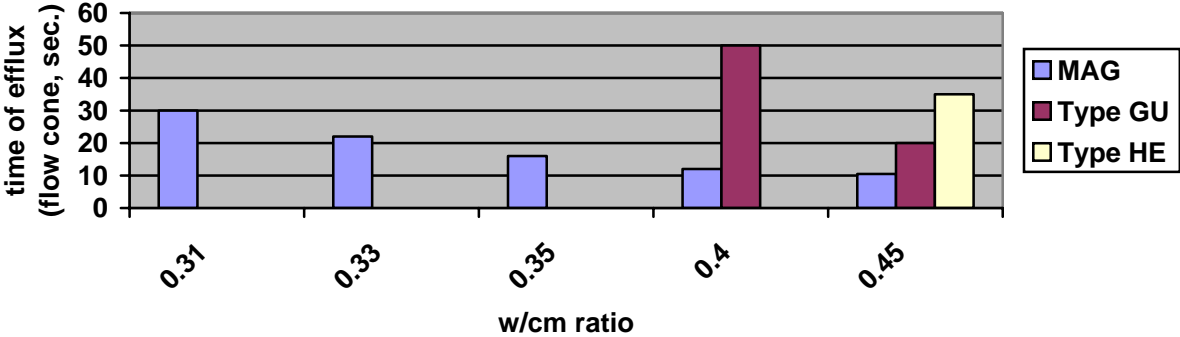
# MICROSIL® ANCHOR GROUT

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**TECHNICAL DATA:** The data outlined below is representative of typical values achievable under controlled laboratory conditions. Results obtained in the field may vary from those stated.

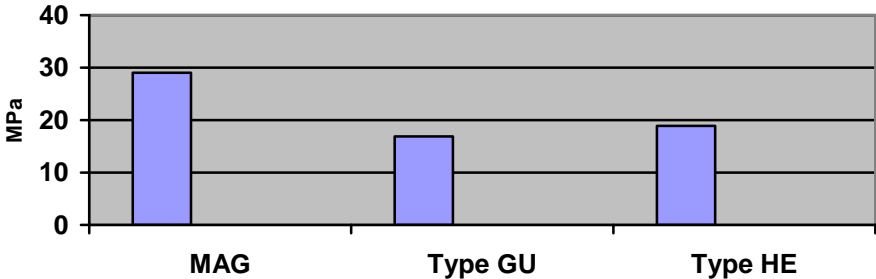
	<u>Test Method</u>	<u>Pumpable</u>		<u>Flowable</u>	
		<u>20° C</u>	<u>8° C</u>	<u>20° C</u>	
Flow		150 %		25 to 35 sec.	
Working Time		1 hour		1 hour	
Plastic Expansion	ASTM C 1107	n/a		1 to 3%	
Hardened Expansion	ASTM C 1107	n/a		+0.094 %	
Bleeding	CSA A 23.2-1B (ASTM C 940)	Nil		Nil	
Segregation	CSA A 23.2-1B (ASTM C 940)	Nil		Nil	
Density - kg/m <sup>3</sup> (lb/ft <sup>3</sup> )	ASTM C 185 (modified)	2121 (132)		2056 (128)	
Yield - m <sup>3</sup> /bag (ft <sup>3</sup> /bag)		.018 (.64)		.020 (.69)	
Compressive Strength MPa (psi)	CSA A 23.2-1B (ASTM C 1107)	<u>Pumpable</u>		<u>Flowable</u>	
		<u>20° C</u>		<u>20° C</u>	
		1-Day	32 (4640)	12 (1740)	27 (3915)
		3-Day	62 (8925)	40 (5830)	38 (5510)
		7-Day	75 (10875)	63 (9120)	50 (7250)
28-Day	79 (11455)	72 (10400)	65 (9425)		

Flow of Microsil Anchor Grout



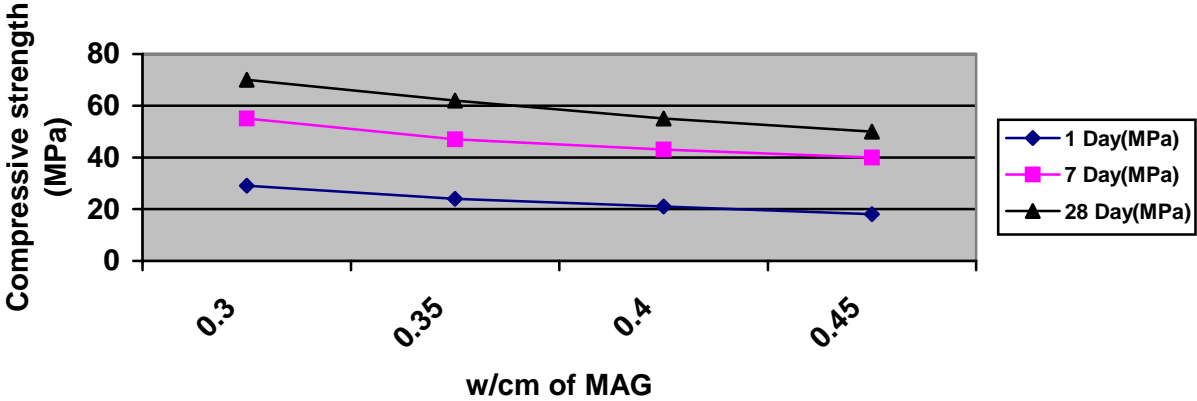
Type GU Cement below a w/cm of 0.45 is not fluid enough to pass through a flow cone. Type GU Cement below a w/cm of 0.4 is not fluid enough to pass through a flow cone. Only M.A.G. is fluid and pumpable below a w/cm of 0.4.

1 Day Compressive Strength of Flowable\* Unsanded Grouts



\* Time of efflux between 16 and 21 seconds.

Compressive strength vs water cementing materials ratio



Note: These are laboratory test results. Field test results will vary due to site conditions.

**LIMITATION:** Adhering to recommended water additions is very important. Exceeding the maximum recommended water content per sack will result in inferior physical properties.  
Liability for damages or defective goods shall be limited to the refund of the purchase price or product replacement.

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**PACKAGING:** MICROSIL® ANCHOR GROUT is packaged in 30 kg (66 lb.) triple-lined paper bags. All Basalite Dry Mix can be custom packaged to meet specific project requirements.

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**SAFETY PRECAUTIONS:** MICROSIL® ANCHOR GROUT contains Portland cement, silica fume, fly ash, and other carefully selected additives. Normal safety wear such as rubber gloves, dust mask and safety glasses, used to handle conventional cement-based products, should be worn. Material Safety Data Sheets are available on request.