MICROSIL® ANCHOR GROUT

ANCHORING GROUT

DESCRIPTION: MICROSIL® ANCHOR GROUT is an un-sanded, Portland cement-based expanding grout containing silica fume (micro-silica), 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 performance requirements of ASTM C1107.

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

⇒ Rock bolts or soil anchors in tunnel support systems.
⇒ Earth tie-backs for excavation or slope stabilization.
⇒ Cable bolting.
⇒ Soil or rock tendons used for anchoring piles or foundation structures.
⇒ Infill of pipe piles.

ADVANTAGES:

⇒ 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.
⇒ 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.
⇒ 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.
⇒ 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).
⇒ SUPERIOR BOND: MICROSIL® ANCHOR GROUT at one day achieves 90% greater tensile bond to rebar than a Type GU cement grout.
⇒ NON-CORROSIVE: MICROSIL® ANCHOR GROUT meets the requirements of CSA A23.1 of "Cement Grout for Bonded Tendons" which sets limits on the concentration of corrosive inducing chemicals in a Portland cement grout.

PROCEDURES:

Mix MICROSIL® ANCHOR GROUT to the consistency required for placement. MICROSIL® ANCHOR GROUT's thixotropic properties at a pumpable consistency make the grout appear thick and cohesive when in fact it is quite pumpable. Over-watering will result in reduced compressive strength and inferior physical properties.

ON SITE TESTING:

⇒ Follow the procedures outlined in CSA A23.2-1B Testing for properties of flowable grout for Viscosity, Bleeding, Expansion and Compressive Strength of Flowable Grout. In the USA, follow ASTM C1107 (modified).
⇒ Take the sample from the mixer discharge. Sample shall be taken between the 10% and 90% points of discharge.
⇒ Minimum sample size must be 5 liters (5.28 USQ).
⇒ Cubes must be restrained with a 'C' clamp and stored indoors for the first 24 hrs. at a temperature between 15°C to25°C (59°F-77°F).
⇒ At 24 hrs. remove cubes from mold and store in water between 15°C to25°C (59°F-77°F) until transported to the lab for testing.
⇒ Standard moist cure the cubes in the lab until the cubes are tested.

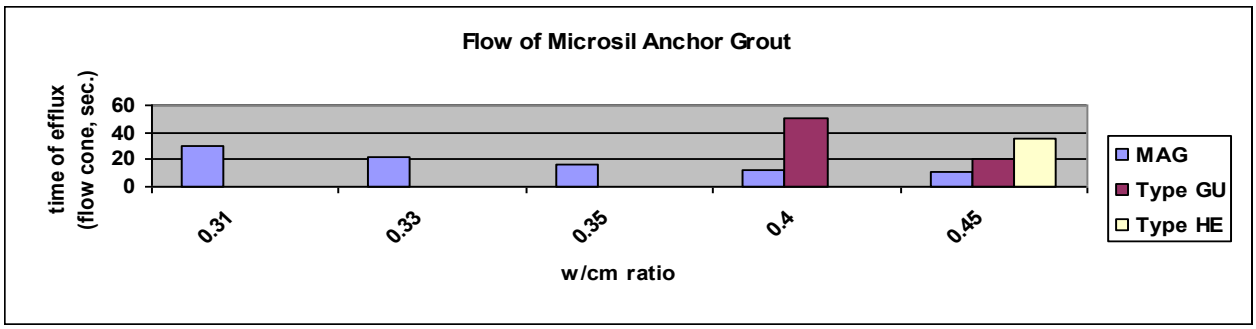
CONSISTENCY	W/CM	RECOMMENDED MAX. WATER (66lbs/30kg bag)
Pumpable	0.27	8.2 liters (2.1 US gal)
Flowable (Fluid)	0.31	9.3 liters (2.5 US gal)

TECHNICAL DATA:

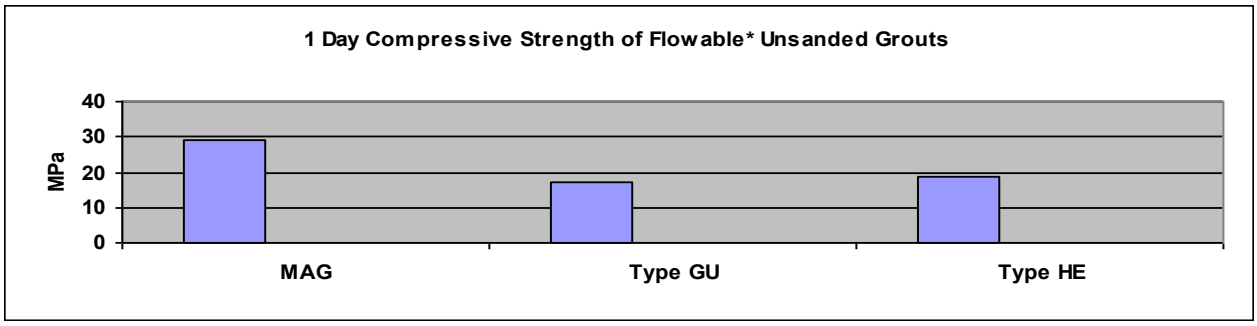
The data outlined below is representative of typical values achievable under controlled laboratory conditions. Results obtained in the field may vary from those stated.

PROPERTIES	TEST METHOD	PUMPABLE	FLOWABLE
Flow	CSA A 23.2 –1B/ ASTM C939	150%	20 to 35 sec
Working time		1 hour	1 hour
Set times	ASTM C266	N/A	5hr 20min (initial) 6hr 40 min (final)
Early Age Expansion	ASTM C827	N/A	3 % (max.)
Hardened Expansion	ASTM C1090	N/A	+0.21%
Bleeding	ASTM C940/ CSA A 23.2 –1B	Nil	Nil
Segregation		Nil	Nil
Density: kg/m3 (lb/ft3)	ASTM C185 (modified)	2121 (132)	2000 (125)
Yield: m^3/bag (ft^3/bag)		.018 (.64)	.019 (.68)
Sulphate Resistance	ASTM C1012	N/A	0.043% at 6 months
Poisson Ratio	ASTM C469	N/A	0.20 at 28 Days
Modulus of Elasticity		N/A	13.4 GPa at 28 days

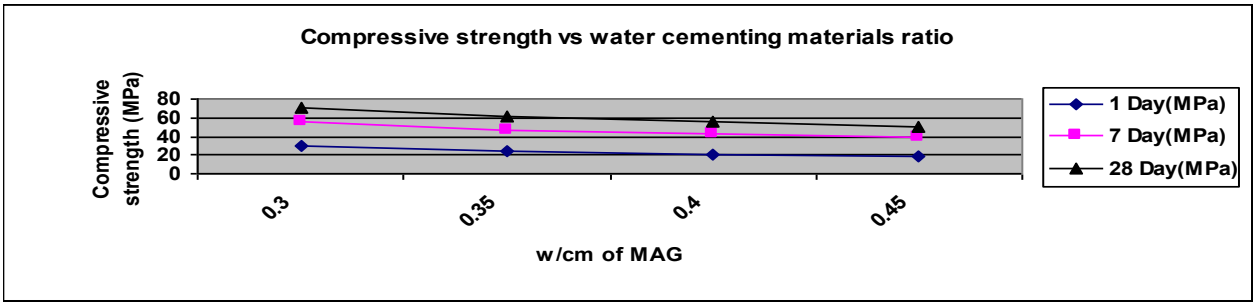
COMPRESSIVE STRENGTH MPa (psi)			
CSA A23.2-1B (ASTM C109)	Pumpable (20°C)	Pumpable (8°C)	Flowable (20°C)
1-Day	30 (4350)	10 (1450)	25 (3600)
3-Day	60 (8700)	37(5365)	35 (5050)
7-Day	75 (10875)	63 (9120)	50 (7250)
28-day	79 (11455)	72 (10400)	65 (9425)



Type GUL Cement below w/cm of 0.45 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.



* Time of efflux between 16 and 21 seconds.



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

LIMITATION:
Adhering to recommended water 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.

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

SAFETY PRECAUTIONS:
MICROSIL® ANCHOR GROUT contains GUL 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.
Safety Data Sheet is available at www.basalite.ca.

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