

# ULTRAFINE CEMENTITIOUS GROUT

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## PRODUCT

US Grout products are ultrafine cementitious grouts composed of a finely ground mixture of Portland cement, pumice and dispersant. The ultrafine grout has an average particle size of only a few microns, in contrast to typical particle sizes of 50 to 70 microns in conventional cements.

## COLOR

Concrete gray

## USES

- Stabilizing weak soils
- Sealing seepage in mines, dams and tunnels
- Low permeability grout curtaining
- Hazardous waste containment
- Oil well squeeze-cementing



## CHARACTERISTICS

- Very low water to cement ratio.
- Little or no bleed.
- Two hours of injectability without measurable agglomeration.
- Volume stability, less than 1% linear shrinkage.
- Low superplasticizer content.
- Enhancement of strength and decreased permeability because of pore refinement.
- Decreased alkalinity and readily soluble residual lime.
- Reduced hydraulic conductivity resulting from reduced solubility and decreased permeability.
- More stable material – excellent longevity.
- Improved resistance to chemical attack due to lower alkalinity.
- Improved resistance to thermal cracking – low heat hydration.

## ADVANTAGES

- U.S. Grout products are ready to use – no additives required.
- Competitively priced.
- Stable North American source of supply.
- Quality control program and modern facility ensures uniformity from order to order.
- Smaller particle size will penetrate smaller fractures and finer soils.
- Low internal cohesion means better penetration and less drilling costs.
- Composed of non-hazardous materials.
- Lower permeability, means reduced hydraulic conductivity and extended longevity.

Product performance is affected by many factors, including storage, method and conditions of application and use. User testing is ESSENTIAL to determine suitability of product for intended method of application and use. Target's SOLE WARRANTY is that the product has been manufactured to specifications. No oral or written information or advice shall increase this warranty or create new warranties. Target's SOLE LIABILITY is to replace product proved defective. In no event shall Target be liable for any consequential, indirect or other damages whether arising from negligence or otherwise.

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## PROCEDURES

Use of U.S. Grout products is simple, but these precise mixing instructions must be followed for best results:

1. The mixer should be a high-shear, "colloidal" mixer such as the Colcrete.
2. Water/dry grout ratio should be 0.6/1 by weight for Type V Premium Grout and 0.8/1 by weight for Type V Standard Grout.
3. Add water to mixer and set unit on high speed.
4. Slowly add dry grout to mixer.
5. Mix at high speed for 3 minutes.

Note: These grouts are thixotropic which means they will become stiff if allowed to remain at rest. This is true of all microfine cement grouts. The material will re-liquefy when a pressure slightly in excess of the material's internal cohesion is applied. In practice, the grout is kept in motion through the use of a continuous loop grouting setup.

## TYPE V PREMIUM GROUT PRODUCT DATA

	Property	Standards & Conditions	Results
<b>Dry</b>	Dispersant		1.5% by weight of dry grout
	Color	Visual	Cement gray
	Particle Size	SediGraph 5100	90% <5 microns, average 2.5 microns
	Surface Area	ASTM C-204 (Blaine Fineness)	17,100 cm <sup>2</sup> /gram
	Dry Loose Unit Weight		0.497 grams/cc
	Dry Density (Specific Gravity)	ASTM C-188	2.63 grams/cm <sup>3</sup>
	Dry Weight/Wet Volume		1.01 kg/liter
<b>Wet</b>	Water/Grout		0.6/1 by weight of dry grout
	Wet Density (Specific Gravity)	API RP 13B-1 (Baroid Mud Balance)	1.64 grams/cc
	Initial Viscosity	API RP 13B-1 (Marsh Cone)	60 seconds
	Internal Cohesion	Lombardi Plate	2.5 Pascals
	Initial Gelation	Wally Baker Shear Vane	3.9 hours
	Final Gelation	Wally Baker Shear Vane	4.9 hours
	Initial Set	ASTM C-191 (Vicat Needle)	6.0 hours
	Final Set	ASTM C-191 (Vicat Needle)	6.8 hours
	Period of Workability		3.8 hours
	Shrinkage	ASTM C-490, C-596, C-157	-0.109%
	Bleeding	ASTM C-940	0%
	Hydrational Heat	Adiabatic Chamber	32 °C
	Pressure Filtration	API Filter Press	0.04 minutes <sup>-½</sup>
	Permeability	Custom Equipment at Atomic Energy of Canada	1x10E <sup>-21</sup> / meters <sup>2</sup>
	Sulfate Resistant	Type V Sulfate Resistant Cement	Resistant to sulfate attack

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## TYPE V STANDARD GROUT PRODUCT DATA

	Property	Standards & Conditions	Results
<b>Dry</b>	Dispersant		2.5% by weight of dry grout
	Color	Visual	Cement gray
	Particle Size	SediGraph 5100	90% <8 microns, average 4 microns
	Surface Area	ASTM C-204 (Blaine Fineness)	15,100 cm <sup>2</sup> /gram
	Dry Loose Unit Weight		0.497 grams/cc
	Dry Density (Specific Gravity)	Accupyc 1330	2.70 grams/cm <sup>3</sup>
	Dry Weight/Wet Volume		1.01 kg/liter
<b>Wet</b>	Water/Grout		0.8/1 by weight of dry grout
	Wet Density (Specific Gravity)	API RP 13B-1 (Baroid Mud Balance)	1.56 grams/cc
	Initial Viscosity	API RP 13B-1 (Marsh Cone)	37 seconds
	Internal Cohesion	Lombardi Plate	1.22 Pascals
	Initial Gelation	Wally Baker Shear Vane	3.7 hours
	Final Gelation	Wally Baker Shear Vane	4.6 hours
	Initial Set	ASTM C-191 (Vicat Needle)	9.33 hours
	Final Set	ASTM C-191 (Vicat Needle)	9.83 hours
	Period of Workability		3.6 hours
	Shrinkage	ASTM C-490, C-596, C-157	-0.0260%
	Bleeding	ASTM C-940	0.5%
	Hydrational Heat	Adiabatic Chamber	31 <sup>o</sup> C
	Pressure Filtration	API Filter Press	0.0678 minutes <sup>-1/2</sup>
	Permeability	Custom Equipment at Atomic Energy of Canada	1x10E <sup>-21</sup> / meters <sup>2</sup>
	Sulfate Resistant	Type V Sulfate Resistant Cement	Resistant to sulfate attack

Manufactured by US Grout, LLC Malad City, Idaho USA

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