



HE Grout

High Early Strength, Non-Shrink Grout

DESCRIPTION

HE Grout is a blend of specialty cements, admixtures and proprietary aggregates designed to provide high flexural and compressive strength performance at flowable consistency. **HE Grout** is non-metallic, non-shrink, non-corrosive and contains no added chlorides.

USES

HE Grout is ideal for a wide variety of precision applications that include:

- Precision Grouting: Machinery bases, compressors, punch presses, generators
- Structural Grouting: Steel columns, precast columns, crane rails, beams
- Anchoring: Guard rails, sign posts, dowels, rods, bolts
- Pumping Applications: Excellent flowability

BENEFITS

- Cost effective: Extendable
- Strength: Attains high compressive strengths at specified water ratio
- Thixotropic: High flow restored by agitation
- Security: Maximum, uniform bearing support
- Non-Metallic/Non-Corrosive: Will not rust
- Hardens free of bleeding or segregation
- Consistent: Strict Quality Control testing and standards

STANDARDS

HE Grout meets and exceeds the requirements of ASTM C1107 and Corp of Engineers CRD C621. When tested in accordance with ASTM C827 at a flowable consistency per ASTM C1107, **HE Grout** yields a controlled, positive expansion.

SURFACE PREPARATION

All surfaces in contact with **HE Grout** shall be free of dirt, oil, grease, laitance and other contaminants that may act as bond-breakers. All unsound concrete should be removed to ensure a good bond. Smooth, dense surfaces need to be mechanically abraded to provide necessary bonding requirements. Mechanically prepare the substrate to a minimum CSP 5 following ICRI Guideline 310.2R to allow proper bonding. ACI recommends that the area to be grouted should be saturated for 24 hours before placement. Remove any standing water. Substrate should be saturated, surface dry (SSD). Maintain contact areas between 40°F (4°C) and 90°F (32°C) prior to grouting and during initial curing period.

FORMING

Method of forming must provide for rapid, continuous grout placement. For pourable grout, construct forms to retain grout without leakage. Forms should be coated with US SPEC form release for easy removal.

MIXING

For larger batches, use a mortar mixer with rotating blades. For smaller batches, use a heavy duty 1/2" (15 mm) (or larger) low-speed, corded drill and mixing paddle #6 per ICRI Technical Guideline 320.5. Pre-wet mixer and empty excess water. Place 3/4 of the required cool, clean potable water in mixer, then add dry material. Mix on low RPM for a total of 3 to 5 minutes, adding the remaining water, until a homogeneous mixture is achieved. When using a mortar mixer higher RPMs may be necessary to achieve a homogeneous mixture. Mix only enough grout that can be placed within working time. Mix using 4.0 quarts of water per 50 lbs (22.7 kg) of dry material. Recommended flow is 125%–145% when tested in accordance with ASTM C1437 per ASTM C1107, Section 3.2.1. For placements greater than 3" depth, **HE Grout** must be extended 30% by weight of powder, with clean, washed and dried 3/8" (1 cm) pea gravel. Do not blend excess water as this will cause bleeding and segregation. Do not use any other admixtures or additives.

PLACING

Grout should be placed using established procedures according to American Concrete Institute recommendations. **HE Grout** can be placed by pumping, pouring, rodding or strapping. Mechanical vibration may cause segregation of aggregates. Place grout on one side of area. Let grout flow to opposite and adjacent sides to avoid entrapment of air and uneven bearing of the grouted surface. When necessary, provide vent holes. Grout should continue to be placed until it protrudes from the entire perimeter area. Grout "head" and excess grout may be removed after initial set. Minimum placement depth; one inch recommended.

FINISHING & CURING

Follow standard ACI curing practices. Do not disturb form-work or grout for 24 hours. Use wet rags or burlap to cure for 6 hours after placement. After 6 hours, remove rags from exposed surfaces and cure with a membrane forming curing compound such as **US SPEC Maxcure Resin Clear**, **US SPEC Hydrasheen** or **US SPEC CS-25-1315**. For best results, exposed grout should extend downward at a 45° angle from edge of base.

STORAGE

Normal cement storage and handling practices should be observed. Store in an interior, cool, dry place. Shelf life is one year in original, unopened container.



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PHYSICAL PROPERTIES

All Physical Property testing performed in laboratory conditions of 73.5 ± 3.5°F (23 ± 2°C) and a relative humidity no less than 50% unless otherwise determined by the test method or specification. All results represent **HE Grout** at a flowable (4.0 quarts) consistency unless listed otherwise. Tests are conducted under standardized conditions for comparative purposes, and results may not be representative of performance under field conditions.

Property and Test Method	Results			
Compressive Strength ASTM C109 via C1107	1 Day	3 Days	7 Days	28 Days
	4,800 psi (33.09 MPa)	7,600 psi (52.40 MPa)	9,000 psi (62.05 MPa)	12,500 psi (86.18 MPa)
Rate of Set ASTM C266	Working Time		Initial	Final
	:30		1:00	2:00
Flexural Strength ASTM C348				28 Days
				1,400 psi (9.65 MPa)
Density ASTM C138				
				138 lb/ft ³ (2,211 kg/m ³)
Modulus of Elasticity ASTM C469				
				4.7 × 10 ⁶ (32.39 GPa)
Freeze/Thaw Resistance ASTM C666	F/T Cycles		Durability	
	300		96%	
Scaling Resistance ASTM C672	Cycles		Scaled Material	
	25		.00 kg/m ²	
Bond Strength ASTM C882	1 Day		28 Days	
	1,700 psi (11.72 MPa)		2,000 psi (13.78 MPa)	
Height Change ASTM C1090	1 Day	3 Days	7 Days	28 Days
	+0.01%	+0.03%	+0.05%	+0.05%
Effective Bearing Area ASTM C1339				>95%
Flow ASTM C1437 per C1107, 3.2.1	Time		Flow	
	5 drops in 3 seconds		143%	

LIMITATIONS

In addition to limitations already mentioned, please note the following. Do not apply when the surface or ambient temperature is below 40°F (4°C) or expected to fall below 40°F (4°C) within 48 hours. When grouting at minimum temperatures, ensure surfaces in contact with grout do not fall below 40°F (4°C) until final set has been achieved and grout has reached 3,000 psi. Do not apply over surfaces that are frozen or contain frost. Do not apply over any active faults or cracks in the substrate without addressing any movement that may occur. Do not use as a patching or overlay mortar or in unconfined areas. Setting time will speed up in hot weather and slow in cold weather. For hot and cold weather applications, contact your US SPEC manufacturer's representative.

DANGER

This product contains Crystalline Silica (CAS# 14808-60-7) and Portland Cement (CAS# 65997-15-1). Harmful if swallowed. Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May cause cancer. May cause respiratory irritation. Causes damage to organs through prolonged or repeated exposure. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. Do not breathe dust.



WARNING: Cancer and Reproductive Harm -
www.P65Warnings.ca.gov

FIRST AID

If swallowed: Immediately call a poison center/doctor. Rinse mouth. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.

MANUFACTURER/TECHNICAL SERVICE

Contact your US SPEC manufacturer's representative for the most current product information. Always read and follow the warnings and instructions on the most current technical data sheets, available online at www.usspec.com.

US MIX Co.
112 South Santa Fe Drive
Denver, CO 80223
Tel: 303.778.7227 Fax: 303.722.8426
Web Site: www.usspec.com

NOTICE OF LIMITED WARRANTY US MIX Co. (manufacturer) warrants to buyer that this product at the time and place of shipment is of good quality and conforms to the manufacturer's specifications in force on the date of manufacture when used in accordance with the instructions hereon. Manufacturer cannot warrant or guarantee any particular method of use, application or performance of the product under any particular condition. This limited warranty cannot be extended or amended by manufacturer's sales people, distributors or representatives or by any sales information, specifications of anyone other than the manufacturer. Liability under this warranty is expressly limited to refund of the purchase price. See product packaging for complete limitation of warranties and liability.

Yield: 50 lb (22.7 kg) will fill approximately 0.43 ft³ when 4.0 quarts mixing water is used.