



# ICS Precision Grout

*High Flow, High Strength, Non-Shrink, Non-Corrosive Grout*

## DESCRIPTION

**ICS Precision Grout** is a blend of portland cement, special admixtures and proprietary aggregates designed to provide high flexural and compressive strength performance from plastic to fluid consistencies. **ICS Precision Grout** is non-metallic, non-shrink, non-corrosive and contains no added chlorides.

## USES

**ICS Precision 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
- Underwater Grouting: Form and pump applications
- Anchoring: Guard rails, sign posts, dowels, rods, bolts
- Pumping Applications: Excellent flowability

## BENEFITS

- Versatile: Plastic or fluid consistency
- Cost effective: Extendable
- Strength: Attains high compressive strengths at specified water ratios
- Thixotropic: High flow restored by agitation
- Non-Corrosive: Will not rust
- Security: Maximum, uniform bearing support
- Performance: Joins, supports and anchors
- Hardens free of bleeding or segregation
- Consistent: Strict Quality Control testing and standards

## STANDARDS

**ICS Precision Grout** has been specifically formulated to exceed the requirements of ASTM C1107 and Corp of Engineers CRD C621. When tested in accordance with ASTM C827, **ICS Precision Grout** yields a controlled, positive expansion. City of LA Research Report #25526.

## SURFACE PREPARATION

All surfaces in contact with **ICS Precision Grout** shall be free of dirt, oil, grease, laitance and other contaminants that may act as bondbreakers. 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 a 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

## MIXING (continued)

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. For plastic consistency, use 3.0 quarts of water. For flowable consistency, use 4.0 quarts of water. For fluid consistency, use 4.5 quarts of water. These mix ratios provide a guideline. The actual water demand will depend on type of mixer used, water temperature and ambient temperature. Adjust the water to achieve the desired flow. Recommended flow is 20 to 30 seconds using the ASTM C939 Flow Cone Method. For placements greater than 3" depth, **ICS Precision 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. **ICS Precision 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.

## FINISHING & CURING

Follow standard ACI curing practices. Do not disturb formwork 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. 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.

## 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 ICS representative.

**Packaging: 50 lb (22.7 kg) bag, 63 bags per pallet**



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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 **ICS Precision Grout** at a fluid (4.5 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			
<b>Compressive Strength</b> ASTM C109 via C1107	<b>1 Day</b>	<b>3 Days</b>	<b>7 Days</b>	<b>28 Days</b>
B - PLASTIC 3.0 qts	4,200 psi (28.96 MPa)	6,200 psi (42.72 MPa)	7,000 psi (48.23 MPa)	8,500 psi (58.57 MPa)
C - FLOWABLE 4.0 qts	4,000 psi (27.58 MPa)	5,900 psi (39.96 MPa)	6,500 psi (44.79 MPa)	8,000 psi (55.16 MPa)
D - FLUID 4.5 qts	3,500 psi (24.13 MPa)	5,000 psi (34.47 MPa)	6,000 psi (41.37 MPa)	7,500 psi (51.71 MPa)
<b>Rate of Set @ 75°F</b> ASTM C266	<b>Working Time</b>	<b>Initial</b>	<b>Final</b>	
B - PLASTIC - 3.0 qts	:40	1:09	2:15	
C - FLOWABLE - 4.0 qts	2:00	2:45	4:30	
D - FLUID - 4.5 qts	2:30	3:30	5:30	
B - 100% - 125% flow table (ASTM C230, 5 drops in 3 seconds)				
C - 125% - 145% flow table (ASTM C230, 5 drops in 3 seconds)				
D - 28 second flow cone method (ASTM C939)				
<b>Flexural Strength</b> ASTM C78	<b>7 Days</b>		<b>28 Days</b>	
	900 psi (6.20 MPa)		1,400 psi (9.65 MPa)	
<b>Density</b> ASTM C138	132 lb/ft <sup>3</sup> (2,114 kg/m <sup>3</sup> )			
<b>Modulus of Elasticity</b> ASTM C469	3.42 x 10 <sup>6</sup> (23.60 GPa)			
<b>Splitting Tensile</b> ASTM C496	<b>28 Days</b> 800 psi (5.52 MPa)			
<b>Scaling Resistance</b> ASTM C672	<b>Cycles</b> 25	<b>Scaled Material</b> .12 kg/m <sup>2</sup> (.02 lb/ft <sup>2</sup> )		
<b>Early Height Change</b> ASTM C827	<b>Final Set</b> (+)0.09%			
<b>Bond Strength</b> ASTM C882	<b>1 Day</b>	<b>7 Days</b>	<b>28 Days</b>	
	1,100 psi (7.58 MPa)	1,700 psi (11.72 MPa)	2,300 psi (15.85 MPa)	
<b>Height Change</b> ASTM C1090	<b>1 Day</b>	<b>3 Days</b>	<b>7 Days</b>	<b>28 Days</b>
	+0.01%	+0.02%	+0.03%	+0.03%
<b>Chloride Ion Content</b> ASTM C1218 / C1152	<b>Water Soluble</b> .002 / .004	<b>Acid Soluble</b> .004 / .009		
<b>Freeze/Thaw Resistance</b> ASTM C666	<b>F/T Cycles</b> 300	<b>Durability</b> 100%		
<b>Effective Bearing Area</b> ASTM C1339	>95%			
<b>Corrosion Resistivity</b>	ICS Precision Grout tested compatible with Vector Corrosion Technologies Galvashield embedded galvanic anodes.			

## PHYSICAL PROPERTIES (continued)

Property and Test Method	Results	
<b>Pull-Out Strength</b> ASTM E488*	<b>Age</b> 28 Days	<b>Tensile Strength</b> 21,670 lbs (9,829.51 kg)
*Average of five tests. 4,000 psi concrete using #4 (1/2") Grade 60 rebar embedded 8" in 2" diameter core-drilled SSD holes. Rebar failed before ICS Precision Grout.		
<b>Coefficient of Thermal Expansion</b> CRD C39	6.9 x 10 <sup>-6</sup> in/in°F (12.42 x 10 <sup>-6</sup> cm/cm°C)	

## 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. Obtain special instructions before use. 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.

**CALIFORNIA PROPOSITION 65:** This product contains Crystalline Silica, Quartz (CAS# 14808-60-7) and may also contain other chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

## 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.

## TECHNICAL SERVICE

Contact your ICS representative for the most current product information. Always read and follow the warnings and instructions on the most current technical data sheets.

Intermountain Concrete Specialties  
425 West 1700 South  
Salt Lake City, UT 84115  
Tel: 801.486.5311 Fax: 801.486.4520  
Web Site: [www.ics50.com](http://www.ics50.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 lbs (22.7 kg) will fill approximately 0.43 ft<sup>3</sup> when 4.5 qts mixing water is used.**