



TECHNICAL DATA SHEET

HORN GROUT

Non-Corrosive Non-Shrink Cementitious Industrial Grout

03600

GROUT
CONCRETE

TAMMS INDUSTRIES
MARCH 2002 (Replaces 1/01)

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- DESCRIPTION:** HORN NON-CORROSIVE NON-SHRINK GROUT is a nonshrink, nonstaining, ready-to-use, high early strength grout. Its multi-flow quality allows this product to be used at various consistencies including pumping into inaccessible areas. HORN NON-CORROSIVE NON-SHRINK GROUT may be packed, rodded, vibrated, poured or pumped. It has high compressive and flexural strengths and is non-rusting and non-corrosive.
- USES:** HORN NON-CORROSIVE NON SHRINK GROUT is used interior or exterior to grout machinery base plates, structural steel, columns, post tensioned cables, anchor bolts, precast structural members, tee joints and a wide range of concrete repair applications. Advantages include:
 - high fluidity, with extended working time for easier placement
 - can be used in wet areas - will not rust
 - controlled expansion without confinement - does not shrink or overexpand
 - high early and ultimate strengths
 - usable in any environment - interior or exterior, wet or dry, hot or cold, above or below grade
 - sets rapidly and uniformly
 - versatile flow capability - pumped, poured or dry packed

MATERIAL PROPERTIES

Material Properties @ 75°F (25°C)			
	Plastic	Pourable	Flowable
Mix water per 50 lb bag, pints	5-3/4	6-1/2	7-1/2
Flow ASTM C230 (flow table)	100%	125%	-
CRD C611 (flow cone)	-	-	30 secs
Setting Time, ASTM C191, hours			
Initial	1.0-1.5	2.0-3.0	4.0-4.5
Final	2.5-3.5	3.5-4.5	6.0-8.0
Compressive Strength, ASTM C109, psi			
1 day	4,200	4,000	2,800
3 day	5,500	5,000	4,000
7 day	7,500	6,000	5,000
28 day	8,000	7,500	6,500
Modulus of Elasticity, ASTM C469 - 4.31×10^6 psi			
Tensile Strength, ASTM C190 psi			
1 day	550		
28 day	640		
Expansion, CRD C588, pct.			
1 day	+0.030%	+0.025%	+0.017%
3 day	+0.040	+0.030	+0.020
28 day	+0.040	+0.030	+0.020
Flexural Strength, ASTM C348, psi			
7 day	1,150		
28 day	1,430		
Early age Height change % ASTM C827	1.68	1.49	1.42
Height change of grout expansion % CRD 621			
3 day	0.06	0.08	0.09
28 day	0.08	0.08	0.10

Values presented are typical and not necessarily referenced to create specifications.

- COMPOSITION AND MATERIAL:** HORN NON-CORROSIVE NON-SHRINK GROUT is a proprietary formulation of cements and graded aggregates.
- COMPLIANCE:** HORN NON-CORROSIVE NON-SHRINK GROUT complies with the following specifications:
 - Corp of Engineer Specifications CRD C-621 and CRD C588
 - ASTM standards: ASTM C-827 and ASTM C1107

Compressive strength is the most often quoted property of cementitious mixtures. Normal 28 day compressive strength of portland cement concrete is 3,000 psi.

Controlled expansion measures the grout's ability to attain and maintain positive and complete contact with base plates, rebars, bolts, etc. Fluidity and Flowability describes the grout's ability to flow freely into a cavity. Pull out test are conducted to establish anchoring strength. There are no standard tests for this. HORN NON-CORROSIVE NON-SHRINK GROUT was tested by drilling 2" diameter holes in fully cured concrete with a compressive strength of 7,520 psi. Pull out test made at 7, 14 and 28 days on NO. 9 grade 60 bars embedded in the holes at depths of 12, 15, and 18 inches showed that the ultimate failure load exceeded the 60,000 psi specified minimum yield point of the rebars.

- SURFACE PREPARATION:** Concrete surface must be structurally sound, dry, free of grease, oils, coatings, dust, curing compounds and other contaminants. Edges of concrete to be grouted that are less than 1 inch (2.54 cm) thick must be vertically cut to form a uniform butt. Smooth substrates must be abraded to ensure proper bonding. Shim and anchor support elements, to prevent movement. Steel must be free of oils, greases, dirt, old coatings or chemical contaminants. Saturate the prepared area with potable water for 12 to 24 hours before application. Remove excess water from holes and voids just before placement to prevent dilution of the grout.
- MIXING INSTRUCTIONS:** HORN NON-CORROSIVE NON-SHRINK GROUT is factory-proportioned and comes ready to use by adding only potable water. Use 5-3/4 pints of water per bag of grout for a plastic mix: 6-1/2 pints for a pourable mix and 7-1/2 pints for a high flow mix. For a uniform mix, use a paddle type mortar mixer. Add 2/3 of the water for the mix consistency desired into the mixer. Add the grout and mix partially. Add the remaining water to achieve the final consistency. Thoroughly mix the entire quantity for 2-3 minutes. Do not mix more material than can be placed in 30 minutes. Do not retemper with additional water after the mixture has started to set. Do not aerate the mix.

7. **APPLICATION TECHNIQUES:** All grouting should be done using established procedures and recommendations of ACI for placing and curing concrete. The method of forming must provide for rapid continuous pouring of the grout and allow a clearance of at least 3 inches for entry and a "grout head" of 4 to 6 inches. Avoid air entrapment by providing adequate venting at the high point and by pouring the grout from one side only. Forms should be 1 to 2 inches above the base plate. HORN NON-CORROSIVE NON-SHRINK GROUT must be placed by pumping, pouring, rodding or vibrating. Lengths of small link chain laid in the form before placing the grout will assist in compacting the grout and eliminating air voids. The grout must be placed and compacted within 30 minutes after mixing. In applications where grout thickness extends from 2 inches up to 5 inches, approximately 12 pounds of 3/8 inch pea gravel which is washed and surface saturated dry may be added per 50 pound bag to extend the mix. For thicknesses over 5 inches, up to 25 pounds of pea gravel may be added per 50 pound bag of HORN NON-CORROSIVE NON-SHRINK GROUT. After placement, rapid drying must be prevented by covering the grout with wet burlap or by applying a membrane forming curing compound from the CLEARSEAL series of products. The forms may be removed after the grout has hardened to an initial set (see material properties). When grouting at higher temperatures, use cool water, shade the area to be grouted and protect the placed grout from direct sunlight for at least 48 hours by covering with wet burlap. When grouting at low temperatures, raise the temperature of foundation bedplate by using steam or infrared heaters. Use warm mixing water and cover the grout to retain warmth. Do not apply heat directly to the grout after its placement. Chloride based set accelerators are not recommended.

8. **COVERAGE:** One 50 pound (22.7 kg) bag will yield approximately 0.43 cubic foot (0.012 cu.m) of grout.

9. **CLEAN-UP INSTRUCTIONS:** Clean tools and equipment with water immediately following. Clean drips with water while still wet. Dried HORN NON-CORROSIVE NON-SHRINK GROUT will require mechanical abrasion for removal.

10. **CAUTIONS:** Do not add anything but potable water. Admixtures or fluidifiers are not recommended. Proper curing practices must be observed. Apply at temperatures 40°F and rising.

11. **ENVIRONMENTAL AND SAFETY PRECAUTIONS: Industrial Use Only.** Contains portland cement which is alkaline on contact with water. Do not breathe dust. May cause delayed lung injury (Silicosis). IARC reports Crystalline silica may cause cancer in humans. Irritating to eyes and skin. Avoid splashing into eyes or contact with skin. In case of eye contact, flood eyes repeatedly with potable water and call a physician. DO NOT RUB EYES. Wash skin thoroughly after handling and before smoking or eating. Use adequate ventilation. **KEEP AWAY FROM CHILDREN AND ANIMALS.**

12. **PACKAGING & STORAGE:** 50 lb. (22.7 kg) poly-lined and DOT approved bags. Protect from moisture. The shelf life is 1 year in unopened bags and in protected storage. The freight class 55.

13. **TECHNICAL SERVICE:** For application procedures or surface conditions not specified above, please contact:

TAMMS INDUSTRIES
3835 State Route 72 Kirkland, IL 60146
800-862-2667 FAX: 815-522-3257
www.tamms.com

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