NA Grout

High Flow, Non-Aggregate, Non-Shrink Grout

DESCRIPTION
NA Grout is a blend of specialty cements and admixtures. This material is designed to provide maximum flow, shrinkage compensation and extended working times in an aggregate free formulation where clearances are minimal, such as the grouting of tendon cables. **NA Grout** is non-metallic and contains no compounds which will produce hydrogen gas, carbon dioxide or oxygen.

USES
NA Grout is ideal for a wide variety of applications that include but are not limited to:
- Grouting of tight clearances between precast segments, beam and columns in contact with stressed steel tendons or cables
- Anchor bolts, rock anchors, dowels and rods where sanded grouts restrict complete encapsulation
- Pumping applications in areas around tensioned cables and tendons to encapsulate and maximize anchorage

BENEFITS
- Extreme fluidity: Can be pumped into areas that are virtually inaccessible with standard non-shrink grouts
- Working time: Extended for maximum pumping range
- Strength: Attains high compressive strengths at specified water ratios
- Thixotropic: High flow restored by agitation
- Corrosion Protection: Encapsulates tendons, bolts or bars to protect from corrosion
- Consistent: Strict Quality Control testing and standards

STANDARDS
NA Grout has been specifically formulated to exceed the requirements of AASHTO LRFD Bridge Construction Specifications Table 10.9.3-2. **NA Grout** is a Class C Grout in accordance with the Post-Tensioning Institutes Guide Specification of Post-Tensioned Structures. **NA Grout** complies with ASTM C-1107.

SURFACE PREPARATION
All surfaces in contact with **NA 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 03732 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 Slickote** for easy removal. Post-tension ducts should be leak free.

MIXING
Post-Tensioning Applications: Use a high-shear colloidal mixer capable of achieving a homogenous mixture. Pre-wet mixer and empty excess water. Mix at a water ratio of 7.75 quarts of cool, clean, potable water per 50 lb bag of **NA Grout**. Mix at approximately 1,500 RPM for 3 to 5 minutes or until desired flow has been achieved and determined using the Modified Flow Cone Method. Mix only enough grout that can be pumped continuously within the working time for mixed grout. Do not blend excess water as this will cause bleeding leading to segregation and sedimentation. Do not use any other admixtures or additives.

PHYSICAL PROPERTIES*

Compressive Strength (ASTM C-942 per PTI GS 4.4.2**)

SET	1 DAY	7 DAYS	28 DAYS
A FLUID	4,500 psi (31.02 MPa)	11,000 psi (75.84 MPa)	15,000 psi (103.42 MPa)

See reverse side for additional test data information.

MIXING [Cont.]
Non Post-Tensioning Applications: Use a mechanical mixer with rotating blades. Pre-wet mixer and empty excess water. Place 7.75 quarts of cool, clean potable water per 50 lb bag in the mixer, then add dry material. Mix for a total of 3 to 5 minutes to achieve desired consistency. Mix only enough grout that can be placed within working time. For placements greater than 3" depth, **NA Grout** must be extended by up to 30%, by weight, with clean, washed and dried 3/8" (1 cm) pea gravel. Do not blend excess water as this will cause bleeding leading to segregation and sedimentation. Do not use any other admixtures or additives.

PLACING
Post-Tensioning Applications: Post-Tensioning grouting applications should commence following grout approval in accordance with governing specifications such as Post-Tensioning Institute Guide Specification, AASHTO LRFD Bridge Construction Specifications Section 10.11, USDOT FHWA Post-Tensioning Tendon Installation and Grouting Manual or other applicable governing specifications.

Non Post-Tensioning Applications: Grout should be placed using established procedures according to American Concrete Institute recommendations. **NA Grout** can be placed by pumping, pouring, rodding or strapping. Mechanical vibration may cause segregation. 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. **NA Grout** must be 100% encapsulated to prevent cracking.

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 such as **US SPEC Maxcure Resin Clear**, **Hydrasheen 15%** or **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 material in an interior, cool, dry place. Shelf life is 9 months 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 when the temperature is expected to fall below 40°F within 48 hours. When grouting at minimum temperatures, ensure surfaces in contact with grout do not fall below 40°F 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. Normal conditions working time is 30 minutes. 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.

Packaging: 50 lb (22.7 kg) bag, 40 bags per pallet

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PHYSICAL PROPERTIES*

Rate of Set (ASTM C-953 per PTI GS 4.4.1**)

SET	INITIAL
A FLUID	9:00

Note: W/C ratio: Less than .45 (per PTI GS Table 3.1)

Volume Change (ASTM C-1090 per PTI GS 4.4.4**)

AGE	% CHANGE
1 DAY	0.02%
28 DAYS	0.03%

Accelerated Corrosion Test (PTI Specification Appendix B**)

NA GROUT	CONTROL
> 3000 hours	302 hours

Wick Induced Bleed (ASTM C-940 modified per PTI GS 4.4.6.1**)

AGE	PERCENT BLEED
4 HOURS	0.0%

Schupack Pressure Bleed (PTI GS 4.4.6.2, Table 4.1 (b)**)

GELMAN PRESSURE	PERCENT BLEED
20 psi	0.0%
30 psi	1.0%
50 psi	1.1%

Permeability (ASTM 1202 modified per PTI GS Specification 4.4.3**)

AGE	APPLIED VOLTAGE	CHARGE PASSED
28 DAYS	30V	< 2500 coulombs

Chloride Ion Content (ASTM C-1152**)

PERCENTAGE
.07%

Initial Fluidity**

TEST	EFFLUX TIME
Flow Cone (ASTM C-939*)	15-30 seconds
Mod. Flow Cone-PTI Spec 4.4.5	6-20 seconds

30 Minutes Fluidity**

TEST	EFFLUX TIME
Flow Cone (ASTM C-939*)	15-30 seconds
Mod. Flow Cone-PTI Spec 4.4.5	6-20 seconds

Inclined Tube Test (EN445 per PTI 4.4.9**)

AGE	% BLEEDING
Immediately After Mixing	0.0%
30 min after mixing w/ 30 sec. remix	0.0%

*Notes: 73°F (22.8°C) 55% humidity
A = 7.75 qts

**PTI M55.1-12

REGULATORY

Read and follow application information, precautions and Material Safety Data Information.

Right-to-know
This product contains Portland Cement (CAS#65997-15-1) and Crystalline Silica (CAS# 14808-60-7)

HMIS
Health 1, Fire 0, Reactivity 0

Prop 65
Warning! This product contains Crystalline Silica, a chemical known to the State of California to cause cancer or reproductive toxicity.

VOC Content
0 g/L

CAUTION

EYE AND SKIN IRRITANT
Contains Portland Cement (CAS# 65997-15-1) and Crystalline Silica (CAS# 14808-60-7). Do not allow contact with eyes or skin. Avoid breathing dust - silica may cause serious lung problems. There is limited evidence silica is a carcinogen. The use of gloves, goggles, dust masks and other protective clothing is recommended. If cement or sand particles get into eyes, rinse immediately with clean water and seek prompt medical attention.

TECHNICAL SERVICE

Contact your US SPEC manufacturer's representative for the most current product information.

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

Yield: 50 lbs (22.7 kg) will fill approximately 0.53 ft³ (0.015 m³) when 7.75 qts mixing water is used.