POLY-TUFF SYSTEMS INTERNATIONAL
HIGHWAY DIVISION

TuffGrout™ NS

Non-shrink, Non-metallic, Multi-purpose Flowable Grout

1.01 DESCRIPTION

TuffGrout™ NS is a non-shrink, non-corrosive, non-metallic, multipurpose, cement based, flowable grout. TuffGrout™ NS is formulated for a wide variety of grouting applications, from damp pack to flowable through a controlled, positive expansion. Please use the correct product grade that complies with VOC regulations as per federal, state, county and city regulations/codes at the place of installation of product.

1.02 USES

- Anchoring
- Machinery Grouting
- Pre-Cast Walls
- Pump And Equipment Based Column Base Plates
- Sign Posts, Dowels, Guard Rails, Bolts
- Tilt-Up Walls

1.03 FEATURES

- Can Be Extended with Pea Stone For Deep Applications
- Can Contribute to Leed Credits
- Chloride and Gypsum-Free
- Controlled Positive Expansion for Maximum Effective Bearing
- Easy To Use, Simply Add Water
- Excellent Freeze/Thaw Resistance
- Natural Concrete Gray
- Non-Corrosive/Will Not Rust
- Non-Metallic
- Pourable/Pumpable Versatility
- USDA Accepted

1.04 TECHNICAL DATA

Corp of Engineers CRD-C-621 Grade A, B & C
ASTM C-1107. Grade A, B & C

1.05 COLOR

Natural Concrete Gray

1.06 PACKAGING

50 lbs (22.7 kgs) multiple-plastic-lined bags

1.07 COVERAGE GUIDE

50 lbs (22.7 kgs) multiple-plastic-lined bag will yield approximately 0.45 cuft (0.012 cum) in a fluid condition. 50% by weight extension (25 lbs or 11.34 kgs) of 3/8" (0.96 cm) pea stone will yield approximately 0.59 cuft (0.0167 cum).

1.08 PREPARATION

Remove all dirt, oil, and loose or foreign material. Any metal in contact with **TuffGrout™ NS** must be free of rust, oil, grease, and other foreign matter which would limit bond. Concrete surface must be sound and roughened to ensure proper bonding. Prior to placing **TuffGrout™ NS**, the surface must be saturated surface dry (SSD), if possible for an hour. Remove all excess water before placement of grout. Bolts, base plates and equipment must be secure and rigid before placement of **TuffGrout™ NS**. All materials and surfaces in contact with the grout should be conditioned between 50-80°F (10-26.66°C) for proper performance. Provide heating or cooling, as necessary, to compensate for temperature extremes and changes in cure time.

Forms: Allow for the continuous placement of **TuffGrout™ NS**. Provisions for venting to avoid air entrapment must be made. Placing from one side, provide a 45° angle in the forms to a height suitable to provide a head of grout during placement. On all sides, provide a minimum 1" (2.54 cm) horizontal clearance between the base plate and forms. Forms should be at least 1" (2.54 cm) higher than the bottom of the base plate.

1.09 MIXING

Small quantities of **TuffGrout™ NS** may be hand mixed in a concrete mixing pan until lump free. For large quantities and continuous pours, mix using a mortar mixer with rubber tipped blades or appropriate grout pump for a minimum of 5 minutes. Start with minimum water requirements. Always add water to mixer first, then slowly add powder. Use only the amount of water required for the desired placement consistency. Mix in two steps: Add 2/3 of the water, add **TuffGrout™ NS**, after partial mixing add the remaining 1/3 of the water for desired consistency. Thoroughly mix total quantity for an additional 2 to 3 minutes. Do not mix more than can be placed before in 40 minutes.

1.10 APPLICATION

Place continuously and quickly. Start from one side to avoid air entrapment. Be sure **TuffGrout™ NS** fills spaces and remains in contact with the plate. DO NOT VIBRATE. A minimum of 1" (2.48 cm) vertical clearance should be maintained for base plate grouting applications. Thinner vertical clearances may require the use of another type of grout.

Deep application: Pre-washed and graded 3/8" (0.96 cm) pea gravel should be used in large applications (greater than 1' x 1' or 30.4 cm x 30.4 cm) and thicker than 3" (7.62 cm) as follows:

3"-5" (7.62-12.7 cm): Add 25% of 3/8" (0.96 cm) pea gravel per 50 lbs (22.68 kgs) bag of grout.

5" (12.7 cm) and over: Add 50% of 3/8" (0.96 cm) pea gravel per 50 lbs (22.68 kgs) bag of grout. Place in 6" (15.24 cm) lifts with proper reinforcement.

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1.11 CURING

Immediately cover with clean, wet rags and keep moist until final set. After final set, remove rags and apply an ASTM-C-309 curing compound, such as **TuffCure™ WB**.

Special Conditions:

Hot weather conditions: Accelerates setting time and causes premature drying of the grout. Keep the grout cool. Store unopened bags in the shade. Provide shade for the area to be grouted. Use cool or chilled mixing water. Protect grout from direct sun exposure for up to 24 hours after grouting. For additional information, refer to ACI 305 (Recommended Practices for Hot Weather Concreting).

Cold weather conditions: Retards strength gain and set time. Warm the grout above 50°F (10°C). Raise the temperature of the area to be grouted with space heaters or steam. Warm the mixing water. Cover and insulate the grout to retain warmth. The minimum temperature (ambient, substrate, and grout) for grouting is 40°F (5°C) unless special provisions are followed. For additional information, refer to ACI 306 (Recommended Practices for Cold Weather Concreting).

1.12 CLEAN UP

Tools and Equipment: Clean with water or PSI's **EnviroClean™**.

1.13 STORAGE AND SHELF LIFE

The material should be stored between 40–95°F (4–35°C) in a cool, dry area away from direct sunlight. The shelf life of properly stored, unopened containers is 12 months from date of manufacture. An excessive temperature differential and/or high humidity can shorten the shelf life expectancy.

1.14 LIMITATIONS

DO NOT place at temperatures below 40°F (5°C) unless special provisions are followed. At low temperatures, water requirement should be field tested.

When nearby equipment causes vibration of the grout, during the set, such equipment should be shut down for a period of 24 hours. DO NOT mix over 5 minutes. DO NOT over water; this can cause bleeding or separation. DO NOT retemper. DO NOT add cement, sand, or admixtures. Avoid hazards by following all precautions found in the Safety Data Sheets (SDS), product labels, and technical literature. Do not dilute. Wear protective gloves and goggles. Avoid prolonged skin contact.

DO NOT EXPOSE TO OR APPLY NEAR FIRE OR FLAMES. FOR WELL VENTILATED OR EXTERIOR USE ONLY!

READ SDS PRIOR TO USING PRODUCT. KEEP OUT OF THE REACH OF CHILDREN.

1.15 PHYSICALS	
Flexural Strength (ASTM C-78) @ 28 days	1415 psi (9.99 MPa)
Tensile Strength (ASTM C-190) @ 28 days	620 psi (4.3MPa)
Split Tensile Strength ASTM C-469 28 Days	735 psi (4.20 MPa)

	Plastic		Flowable		Fluid	
Water per 50 lbs	6.30-6.85 pints	2.98-3.25 liters	6.85-7.75 pints	3.25-3.68 liters	7.75-8.35 pints	3.68-3.95 liters
Comprehensive Strength ASTM C-109						
1 Day	4,000 psi	27.58 MPa	3,100 psi	21.37 MPa	1,450 psi	9.99 MPa
3 Days	5,500 psi	37.92 MPa	5,000 psi	34.47 MPa	3,700 psi	25.51 MPa
14 Days	8,100 psi	55.85 MPa	6,900 psi	47.57 MPa	6,200 psi	42.75 MPa
28 Days	10,200 psi	70.32 MPa	8,400 psi	57.92 MPa	8,100 psi	55.85 MPa
Expansion Percentage % ASTM C-1090						
1 Day	0.07		0.03		0.02	
3 Days	0.07		0.03		0.02	
14 Days	0.07		0.03		0.02	
28 Days	0.07		0.03		0.02	

Note: The data shown is based on controlled laboratory testing. Reasonable variation from test results shown can be expected. Field and laboratory testing should be controlled on the basis of the desired placing consistency, rather than strictly on water content.

Please read all information in the General & Safety Guidelines, Technical Data Sheets, Guide Specifications and Safety Data Sheets (SDS) before applying material. PSI Products are for "Professional Use Only" and preferably applied by professionals who have prior experience with the PSI Products or have undergone training in application of PSI Products. Published technical data and instructions are subject to change without notice. Contact your local PSI representative or visit our website for current technical data, instructions, and project specific recommendations.

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