

1. PRODUCT NAME

Tenon[®] High Strength Precision Grout

2. MANUFACTURER

Bluestone Products[™], a TCC Materials[®] company
 2025 Centre Pointe Blvd.
 Mendota Heights, MN 55120 USA

Phone: 1.651.688.9116
 Fax: 1.651.688.9164
 Internet: tccmaterials.com

3. PRODUCT DESCRIPTION

Tenon[®] High Strength Precision Grout is a specially formulated, ready to use, high strength, flowable precision grout.

Features and Benefits

- Interior/Exterior
- Can be pumped into areas inaccessible by conventional grouting methods
- Combines high-fluidity, excellent working time and early strength build insuring quick job start ups, thereby reducing costs
- High initial and ultimate flexural and compressive strengths
- Non-porous, high density grout resistant to water and salt penetration and damage from freeze/thaw cycles
- Non-shrink, high fluidity and controlled expansion provide full load bearing coverage
- Non-metallic, non-staining and non-corrosive
- Contains no chlorides or other salts detrimental to reinforcing steel
- Can be extended with proper aggregate by up to 50%
- Conforms to CRD-C621 Corps of Engineers Specification for Non-Shrink Grout and ASTM C-1107

Uses

- Precision grouting of machinery bases sole plates, rolling mills, generators, anchor bolts, transfer lines, paper mills and structural grouting of precast columns, crane rails, bridge seats, dowels, etc.
- Grouting applications where shrinkage must be eliminated and corrosion and staining cannot be accepted

Note: To repair voids in concrete due to improper consolidation, use Rub-Pro or Blend-Pro. See respective product Technical Data Sheet for more information.

SAFETY

READ THE SAFETY DATA SHEET (SDS) BEFORE USING THIS PRODUCT. SDS information is available on our website: tccmaterials.com or contact TCC Materials[®] at 651-688-9116 (7:30 AM to 4:00 PM, M-F, Central US Time).

CAUTIONS

Read complete cautionary information printed on product container prior to use.

This Product Data Sheet has been prepared in good faith on the basis of information available at the time of publication. It is intended to provide users with information about and guidelines for the proper use and application of the covered Tenon[®] brand product (s) under normal environmental and working conditions. Because each project is different, neither Tenon[®] nor TCC Materials[®] can be responsible for the consequences of variations in such conditions, or for unforeseen conditions.

4. TECHNICAL DATA

	Plastic	Flowable	Fluid
Mixing Water per 50 lb. (22.7 kg)	4.0 qt. (3.8 L)	5.0 qt. (4.7 L)	5.5 qt. (5.2 L)
Flow	120-125%	125-140%	20-30 sec.
ASTM C 191 Setting Time of Hydraulic Cement by Vicat Needle			
	Plastic	Flowable	Fluid
Initial Set	5 hrs.	6 hrs.	6.5 hrs.
Final Set	5.75 hrs.	7 hrs.	7.5 hrs.

Compressive Strength ASTM C 109				
	Plastic	Flowable	Fluid	Requirements
24 hours	6,000 psi (41.4 MPa)	5,500 psi (38.0 MPa)	4,000 psi (27.6 MPa)	1,000 min.
3 days	7,200 psi (49.7 MPa)	7,000 psi (48.2 MPa)	6,100 psi (42.1 MPa)	2,500 min.
7 days	8,500 psi (58.6 MPa)	8,500 psi (58.6 MPa)	7,500 psi (51.8 MPa)	3,500 min.
28 days	10,500 psi (72.5 MPa)	10,000 psi (69.0 MPa)	9,000 psi (62.1 MPa)	5,000 min.

ASTM C 1090 Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout				
	Plastic	Flowable	Fluid	Requirements
24 hour expansion	+0.04%	+0.01%	+0.00%	+0.02% to 0.3%
3 day expansion	+0.04%	+0.02%	+0.00%	+0.02% to 0.3%
28 day expansion	+0.06%	+0.03%	+0.00%	+0.02% to 0.3%
ASTM C 827 Changes in Height of Cylindrical Specimens				
Average Change in Height at Final Set	0.55%	1.49%	1.23 %	0 to 4.0%

Note: Test results obtained under controlled laboratory conditions at 73°F (22.7°C) and 50% relative humidity. More or less water may be required to achieve the desired mixing consistency depending on the atmospheric conditions and job site conditions. Do not exceed 4.5 qt (4.3 L) water per 50 lb. (22.7 kg) bag.

LEED® Eligibility¹

- Regional Materials (MR-c5)

Packaging

50 lb. (22.7 kg.) bag (BOM #120707)

Shelf Life

12 months from the date of manufacture when stored in the original, unopened container, away from moisture, under cool, dry conditions and out of direct sunlight.

5. INSTALLATION

Preparation

All materials should be conditioned to 40°F-80°F (4°C-27°C) 24 hours prior to installation.

- All grout surfaces must be solid, completely free of oil, wax, grease, sealers, paint and other contaminants that may act as a bond breaker.
- Unsound concrete must be chipped away, leaving a rough solid surface insuring bond.
- Prior to grouting, areas should be saturated with water for 12 - 24 hours after which all excess water is removed. This produces a saturated surface dry (SSD) grouting area.
- Forms must be sealed to prevent water or grout escaping and provide for rapid continuous grout placement. When placing provide an angle in the forms high enough to assist in grouting.
- For pouring minimum openings of 3" (76 mm) for entry

and 6" (152 mm) for "head" are recommended. Venting must be provided to avoid entrapping air. Forms should be at least

1" (25 mm) higher than the bottom of the base plate.

- Maintain ambient and surface temperatures between 40°F and 95°F. Set times and strength developments are dependent on temperature. Hot temperatures will accelerate physical properties while cold will have a retarding effect.

Forms: The design of the form work for grouting should take into account the type of grout, the consistency of the grout, the method of placement, and the distance the grout must travel. The forms should be built so that the grout can be placed as continuously and expeditiously as possible.

Refer to:

- ACI 305 Hot Weather Concreting
- ACI 306 Cold Weather Concreting

Note: It is the responsibility of the installer/applicator to ensure the suitability of the product for its intended use.

Job Mockups

The manufacturer requires that when its Tenon® products are used in any application or as part of any system that includes other manufacturers' products, the contractor and/or design professional shall test all the system components collectively for compatibility, performance and long-term intended use in accordance with pertinent and accepted industry standards prior to any construction. Written documentation of the tests performed shall be satisfactory to the design professional and contractor. Test results must include the means and methods of application, products used, project-specific conditions being addressed, and standardized tests performed for each proposed system or variation.

Mixing

Water requirements for desired grout consistency

- **Plastic (trowel consistency):**
4.0 qt. (3.8 L) of clean potable water per 50 lb. bag (22.7 kg)
- **Flowable (pumping consistency):**
5.0 qt. (4.7 L) of clean potable water per 50 lb. bag (22.7 kg)
- **Fluid (pumping consistency):**
5.5 qt. (5.2 L) of clean potable water per 50 lb. bag (22.7 kg)

** Maximum allowable water for mixing. Do not overwater the product.

Note: The water quantities shown are approximate and may vary slightly with type of equipment and application conditions. Do not overwater.

1. Only mix with clean potable water and/or for thicker applications extend with clean SSD $\frac{3}{8}$ (9 mm) pea gravel. Addition of cold water at high temperatures or warm water at low temperatures will aid in adjusting the mix temperature.
2. Place $\frac{3}{4}$ of desired mixing water, start mixer, then slowly add the dry material. After all of the powder has been added, slowly add the remaining $\frac{1}{4}$ water until the desired consistency is achieved.
3. Avoid adding excessive amounts of water that promotes segregation or bleeding of the grout.
4. Mix mechanically with a high torque electric drill, do not exceed 600 rpm using a paddle type mixing blade or an appropriately sized mortar mixer.
5. Mix for 3 - 5 minutes to ensure a uniform lump free consistency and place immediately.

Note: More or less water may be required to achieve a 25 - 30 second flow or the desired mixing consistency depending on the temperature and other variables.

Application

Apply only when air and substrate temperatures are between 40°F–90°F (10°C–32°C) within 24 hours of application and when rain is not expected within 12 hours.

1. Fluid working time approximately 30 minutes @ 70°F (21°C)
2. Agitate material as necessary within its working time to maintain workability.
3. Provide vent holes where necessary.
4. Pour and place grout from one side of form to eliminate air voids.
5. A vibrator, rod, chain or trowel may be used to assist in consolidating the grout and eliminating air voids. Use a mixer large enough to permit continuous placement before any part of the grout has set.
6. Confine grout to ensure minimum surface exposure. Avoid vibration for 24 hours after placement.
7. For placements greater than 4" (76 mm), extend the grout with 25 lb. (11.3 kg) of washed clean SSD (saturated surface dry) $\frac{3}{8}$ (9 mm) graded aggregate per 50 lb (22.7 kg) bag.
8. After placement, immediately trim the surfaces and edges with a trowel.
9. Minimum application thickness is 1" (25 mm).
10. Forms may be removed after grout has hardened to an initial set

Note: For installation where acids and sulfates are present, a protective coating is required. Protect uncoated aluminum from direct contact with Portland-cement based materials.

Jobsite Testing

Jobsite strength tests must use ASTM C-1107 specifications 2 in. (51 mm) metal cube molds. DO NOT use cylinder molds or plastic cube molds. Control testing based on achieving the desired flow rather than water content.

Curing

- Forms may be removed after the grout has hardened to an initial set and retains its shape. This time period will vary according to temperature. At this point final finishing and curing can start.
- The grout should slope downward from baseplates or similar structures at a 45° angle from the lower edge.
- Prevent rapid water loss by covering the exposed grout surfaces with wet burlap during the first 48 hours or apply an acceptable water based cure and seal agent.

Refer to:

- ACI 308 Standard Practice for Curing Concrete Wet Cure
- ACI 308R Guide to Curing Concrete

Cleaning

Use clean potable water to clean all tools immediately after use. Dried material must be mechanically removed. Use a waste water hardener (e.g. Conglez™ or similar product) for cementitious waste disposal

Limitations

- Do not mix more grout than can be placed in 20 minutes.
- Do not apply in applications thicknesses <1 in. (25 mm)
- Do not overwater, retemper, or mix with other additives.
- Do use in applications of high dynamic loading.
- Install in accordance with local building codes and applicable ASTM standards.
- Do not allow Portland cement-based materials to come in direct contact with uncoated aluminum.
- Do not use as a floor topping or in large areas with an exposed shoulder around base plates.
- Do not add accelerators, retarders, plasticizer, or other additives.
- Mixing time and water amounts should be consistent from batch to batch.
- Grout should be cured for a minimum of 28 days.

Coverage

- One 50 lb. (22.7 kg) bag yields approximately 0.46 ft³ (0.01 m³) at 5.5 qt (5.2 L) of water
- One 50 lb. (22.7 kg) bag extended with 25 lb. (11.3 kg) of washed pea gravel $\frac{3}{8}$ (10 mm) yields approximately 0.63 ft³ (0.02 m³) at 5.5 qt (5.2 L) of water

6. AVAILABILITY

To locate Tenon® products in your area, please contact:

Phone: 1.651.688.9116
Email: info@tccmaterials.com

7. WARRANTY

Seller warrants that its product will conform to and perform in accordance with the product specifications. The foregoing warranty is in lieu of all other warranties, expressed or implied, including, but not limited to those concerning merchantability and fitness for a particular purpose. Because of the difficulty in ascertaining and measuring damages hereunder, it is agreed that Seller's liability to the Buyer shall not exceed the total amount billed and billable to the Buyer for the product hereunder.

8. MAINTENANCE

Not applicable.

9. TECHNICAL SERVICES

Technical Assistance:

Information is available by calling TCC Materials® (hours 7:30 AM to 4:00 PM, M-F, CST):

Phone: 1.651.688.9116
Email: info@tccmaterials.com
Web: tccmaterials.com

Technical and Safety Literature:

To acquire technical and safety literature, please visit our website at: tccmaterials.com.

10. FILING SYSTEM

Division 3

Tenon® products can contribute to LEED® credits within the Material Resource, (Recycled Content & Regional Materials) and Indoor Environmental Quality (Low Emitting Materials).

LEED® is a registered trademark of U.S. Green Building Council.



Bluestone Products, A TCC Materials
Company

2025 Centre Pointe Blvd. Mendota
Heights, MN 55120
tccmaterials.com

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REV 06/21