

HARDOGROUT

Ready Mixed Non-Shrink Cementitious Grout

HARDOGROUT is designed for critical use where high strength, non-staining characteristics and positive expansion are required. It contains only natural aggregate and an expansive cementitious binder.

USES

HARDOGROUT general purpose grouting is used where it is essential to eliminate shrinkage when completely filling the void between a base plate and a substrate. Such an application would be the grouting of a stanchion base plate. It can also be used for anchoring a wide range of fixings. These include masts, anchor bolts and fence posts.

ADVANTAGES

- Gaseous expansion system compensates for shrinkage and settlement in the plastic state. No metallic iron content to cause staining.
- Prepackaged material overcomes potential on-site batching variations.
- Develops high early strength without the use of chlorides.
- High ultimate strength and low permeability ensure the durability of the hardened grout.

SPECIFICATION / COMPLIANCES

- Meets the requirements of CRD C-621, Corps of Engineers Specification for Non-Shrink Grout, at a flow-able consistency.
- Shows positive expansion when tested in accordance with ASTM Specification C- 1090, Standard Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout, at a flow-able consistency.
- Meets the performance requirements of ASTM C-1107, Grades A & B as well as Grade C, combination volume adjusting grout standard specification for packaged dry, hydraulic-cement grout (non-shrinkable), at a flow-able consistency.

DESCRIPTION

HARDOGROUT is a blend of Portland cement, graded fillers and chemical additives which impart controlled expansion in the plastic state whilst minimizing water demand. The low water demand ensures high early strength. The graded filler is designed to assist uniform mixing and produce a consistent grout.

HARDOGROUT (Cementitious) is supplied as a ready to use dry powder. The addition of a controlled amount of clean water produces a flowing non-shrink grout for gap thicknesses up to 100 mm. In case of large size of holes / pockets, Mitchell recommends the addition of aggregate from 10% – 30%. The size of aggregate should be finalized as per requirement or with the consultation of Mitchell representative.

TECHNICAL INFORMATION

The following results were obtained at a water powder ratio of 0.19 and temperature of 25°C.

Compressive Strength

2" (50mm) cubes (ASTM C-109 modified*)
 27 N/mm² @ 1 day
 57 N/mm² @ 7 days
 65 N/mm² @ 28 days

Flexural Strength

2.5 N/mm² @ 1 day
 9.0 N/mm² @ 7 days
 10.0 N/mm² @ 28 days

Time for Expansion

Start	15 minutes
Finish	2 hours
Fresh wet density	approximately 2170 kg/m ³ depending on actual consistency used.
Young's modulus ASTM C 469-83	28 kN/mm ²

Expansion Characteristics

An expansion of up to 1% overcomes plastic settlement in the unset material.

APPEARANCE

HARDOGROUT is a free flowing powder designed to be mixed with water. After mixing and placing, the color may initially appear much darker than the surrounding concrete. While this color will lighten up substantially as the concrete cures and dries out, the grout may always appear somewhat darker than the surrounding concrete.

SHELF LIFE

2 years in original, unopened package.

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PACKAGING

HARDOGROUT is packaged in 25kg bag.

DIRECTIONS FOR USE

If the contractor is not familiar with standard grout placement techniques, a pre-job meeting is suggested to review the project details unique to the particular job.

Careful preparation is a must for a successful grouting operation.

Grouts generally work best at 50°-80°F (10°-27°C). Cold weather retards strength gain and set time. Hot weather accelerates setting time and causes premature drying of the grout. Provide heating or cooling, as necessary, to compensate for extremes in ambient temperatures and resulting variations in cure time.

At 25°C place the grout within 15 minutes of mixing to gain full benefit of the expansion process.

HARDOGROUT can be placed in thicknesses up to 100 mm in a single pour when used as an under plate grout. For thicker sections it is necessary to fill out **HARDOGROUT** with well graded 10mm, silt free aggregate to minimize exothermic. If bulking with aggregate is used the ratio shall not exceed 1:1. The properties of a bulked grout will differ from those published in this data sheet. Any bolt pockets must be grouted prior to grouting between the substrate and the base plate. Continuous grout flow is essential. Sufficient grout must be prepared before starting. The time taken to pour a batch must be regulated to the time taken to prepare the next one. Pouring should be from one side of the void to eliminate any air or pre-soaking water becoming trapped under the base plate. It is advisable to pour the grout across the shortest distance of travel. The grout head must be maintained at all times so that a continuous grout front is achieved. Where large volumes have to be placed **HARDOGROUT** may be pumped. A heavy duty diaphragm pump is recommended for this purpose. Screw feed and piston pumps may also be suitable.

SURFACE PREPARATION

Surfaces to be grouted should be clean and free from rust, grease or oil. Determine work schedule and method of placing grout, then prepare strong, properly braced and oiled forms to retain the grout and provide relief holes, if needed. Saturate the area to be grouted with water until it is uniformly damp and remove excess water just before placing the grout.

MIXING

Small quantities may be mixed with a drill and "jiffy" mixer. Use a paddle type mortar mixer for large jobs. All materials should be in the proper temperature range of 50-80°F (10°-27°C). Add the appropriate amount of clean, potable water for the batch size and then add the dry grout. Mix for a minimum of 2-3 minutes. The mixed grout should be quickly transported to the grouting site and placed immediately.

CURING AND SEALING

Proper curing procedures are important to ensure the durability and quality of the grout. Cure the grout with a high solids curing compound, such as **HARDOCURE WB** compound must be ordered separately. Improper curing can cause minor cracks on outer layer and minimize the ultimate strength.

CLEAN-UP

Clean tools and equipment with water before the material hardens.

PRECAUTIONS / LIMITATIONS

- Do not add any admixture or fluidities.
- Proper curing is required.
- Employ cold weather or hot weather grouting practices as the temperatures dictates.
- Store materials in a dry place.
- Do not allow to freeze until 4000 PSI (27.6 N/mm²) is attained.
- Do not use as a topping.
- Do not use material at temperatures that may cause premature freezing.
- Rate of strength gain is significantly affected at temperature extremes

Consistency Estimated Water Content

Quantity of water required to be added 25 kg bags to achieve the desired consistency and yield are below:

Consistency	Water	Yields
Trowel-able	3.00 – 3.40 liters	11.5 liters
Flow-able	3.50 – 3.75 liters	12.9 liters

To have a homogenous mix water should be accurately measured and gradually added to **HARDOGROUT** continue to mix for 5 minutes.