

CemkrouT GPH

Special high strength non-shrink cementitious grout

Innovative products for your success

Uses

CemkrouT GPH is used for general purpose grouting where it is essential to eliminate shrinkage when completely filling the void between a base plate/formwork and a substrate. Such an application would be the grouting of a stanchion base plate structural reinstatement works and heavy machinery stabilization work. It can also be used for anchoring a wide range of fixings. These include masts, anchor bolts fence posts and bridge plates.

Advantages

- Gaseous expansion system compensates for shrinkage and settlement in the plastic state.
- No metallic iron content to cause staining.
- Prepackaged grout 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.
- Against carbon dioxide and chloride diffusion.

Description

CemkrouT GPH high strength non-shrink cementitious grout 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 thickness up to 100mm.

CemkrouT GPH 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.

Technical Support

Cemkcrete offers a comprehensive range of high quality, high performance construction products. In addition, It also offers a technical support and on-site service to specifiers, contractors and other end users.

Properties

W/P ratio

Plastic	:	0.13 - 0.14
Flowable	:	0.15 - 0.18

The following results were obtained at a water : powder ratio of 0.15 and temperature of 25 °C. Test method for typical result.

Standards Compliance

CemkrouT GPH is a high performance non-shrink cementitious grout for critical applications which has been independently tested by an accredited laboratory in accordance with the following standards:

ASTM C109-95

ASTM C940

ASTM C942

BS1881 : part 116 (1983)

ASTM C827-87

Dtp SHW 1991 Cl.260 (viii)

CemkrouT GPH is formulated to comply with ASTM C1107-91 Grade B.

Specification Clause

Performance specification

All grouting works where its intended to use must be carried out with a prepackaged cement based product which is chloride-free.

It shall be mixed with water to the required consistency. The plastic grout must not bleed or segregate.

A positive volumetric expansion shall occur while the grout is plastic by means of a gaseous system. The compressive strength of the grout must exceed 75N/mm² at 7 days and 90N/mm² at 28 days

The storage, handling and placement of the grout must be in strict accordance with the manufacturer's instruction.

Supplier specification

All grouting where designated to use must be carried out with CemkrouT GPH manufactured by Cemkcrete and used in accordance with the manufacturer's data sheet instructions.

Application Instruction

Preparation

Foundation Surface

The substrate surface must be free from oil, grease or any loosely adherent material. If the concrete surface is defective or has laitance, it must be made to a sound base. Bolt holes and fixing pockets must be blown clean of any dirt or debris.

Pre-soaking

Several hours to grouting the area of cleaned foundation should be flooded with fresh water. Immediately before grouting takes place any free standing water should blow out of bolt holes and pockets.

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Compressive strength
BS 1881: PART 116 1983
ASTM C942

Flowable :

40N/mm ² @	1 Days
70N/mm ² @	3 Days
85N/mm ² @	7 Days
100N/mm ² @	28 Days

Plastic:

45N/mm ² @	1 Days
75N/mm ² @	3 Days
90N/mm ² @	7 Days
105N/mm ² @	28 Days

Flexural strength :
BS 4551 1980

2.5N/mm ² @	1 Days
9.0N/mm ² @	7 Days
10.0N/mm ² @	28 Days

Time for expansion

Start :	15 Minutes
Finish:	2 Hours

Fresh wet density : Approximately 2170 kg/m³
 Depending on actual
 Consistency used.

Young's modulus
ASTM 469-83 : 28 kN/mm²

Expansion
ASTM C827-84 : 0.25% - 1.0%
Elastic stability
(compressive strain)
Dtp SHW 1991
clause 260 (viii) : < 1%

Total acid soluble
Sulphate SO₃ (as %
Of mass of cement) : < 4%

Mixing and Placing

Mixing

For best results a mechanically powered grout mixer should be used. When quantities up to 50 kg are used, a slow speed drill fitted with a high shear mixer is suitable. Larger quantities will require a high shear vane mixer. Do not use a colloidal impeller mixer.

To enable the grouting operation to be carried out continuously, it is essential that sufficient mixing capacity and labor are available. The use of a grout holding tank with provision to gently agitate the grout would be required.

Typical hopper system

Removable hopper : For larger pours the grout may be hand placed or pumped into a removable hopper (trough)

Pouring should be from one side of the void to eliminate any air or presoaking 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 time so that a continuous grout front is achieved.

Where large volumes have to be placed CemkrouT GPH may be pumped. A heavy duty diaphragm pump is recommended for this purpose. Screw feed and piston pumps may also be suitable.

Curing

On completion of the grouting operation, exposed areas should be thoroughly cured. This should be done by the use of Cemkure curing membrane, continuous application of water and/or wet Hessian.

Cleaning

CemkrouT GPH should be removed from tools and equipment with clean water immediately after use. Cured material can be removed mechanically, or with Cemkcrete Acid Etch.

Placing

At 20 degree °C place the grout within 20 minutes of mixing to gain full benefit of the expansion process.

CemkrouT GPH can be placed in thickness up to 100mm in a single pour when used as an under plate grout. For thicker section it is necessary to fill out CemkrouT GPH with well graded silt free aggregate to minimize heat build up, typically a 10mm aggregate is suitable.

Any bolt pockets must be grouted prior to grouting between the substrate and the base plate.

Continuous grout is essential. Sufficient grout must be prepared before starting. The time taken to pour a batch must be regulated to the time to prepare the next one.

Base Plate

It is essential the surface is clean and free from oil release or scale. Air pressure relief holes should be provided to allow venting of any isolated high spots.

Leveling shims

If these are to be removed after the grout has hardened, they should be treated with a thin layer of grease.

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Formwork

The formwork should be constructed to be leak proof. This can be achieved by using foam rubber strip or mastic sealant beneath the constructed formwork and between joints. In some cases it is practical to use sacrificial semi-dry sand and cement formwork. The formwork should include outlets for pre-soaking.

Unrestrained surface area

This must be kept to a minimum gap. Generally the gap width between the perimeter formwork and the plate edge should not exceed 150mm on the pouring side and 50mm on the opposite side. It is advisable where practical to have no gap at the flank sides.

Consistency of grout mix

The quantity of clean water required to be added into a 25kg of CemkrouT GPH is given below to achieve the desired consistency:

Trowellable :	3.25-3.50 liters
Flowable :	3.75-4.50 liters

The selected water content should be accurately measured into the mixer. The total contents of the CemkrouT GPH bag should be slowly added and continuous mixing should take place for 5 minutes. This will ensure that the grout has a smooth even consistency.

Limitations

Low temperature working

When the air or contact surface temperatures are 5 °C or below on a falling thermometer, warm water (30 - 40 °C) is recommended to accelerate strength development.

For ambient temperatures below 10°C the formwork should be kept in place for at least 36 hours. Normal precautions for winter working with cementitious materials should then be adopted.

High temperature working

At ambient temperatures above 35°C cool water (below 20 °C) should be used for used for mixing the grout prior to placement.

Precautions

Health and safety

CemkrouT GPH is alkaline and should not come into contact with skin and eyes. Avoid inhalation of dust during mixing. Gloves, goggles and dust mask should be worn. If contact with skin occurs, wash with water. Splashes to eyes should be washed immediately with plenty of clean water and seek medical advice sought.

Fire : CemkrouT GPH is nonflammable

Estimating

Supply

CemkrouT GPH is supplied in 25kg moisture resistant bags.

Yield

Allowance should be made for wastage when estimating quantities required. The approximate yield per 25kg bag for different consistencies is:

Consistency	Trowellable	Flow able
Yield (liters)	13.20	13.70

Storage

CemkrouT GPH has a shelf life of 12 months if kept in a dry store in sealed bags. If stored in high temperature and high humidity locations the shelf life may be reduced.

Important Note: CemkrouT warrants its materials free of manufacturing defects and produced as per standard specifications and sold under the terms and conditions of usages, whilst CemkrouT endeavors to ensure that any advice, recommendation, or information, given through its products literatures are reflects of the R&D in-house lab test and practical sites experience and knowledge based feed backs, however, the products are being used under various conditions and applied beyond its control where or how either directly or indirectly at various locations and places at a different stages that of an intended purposes and uses. Therefore, CemkrouT cannot hold warranty or responsible for resultant consequences, such as damages to the property or assets but the product itself.