MINOVA

MINING / CONSTRUCTION

Capcem™ GP

CEMENTITIOUS GROUT

DESCRIPTION

Capcem™ GP 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 thicknesses up to 100mm.

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

APPLICATION AND USE

Capcem™ GP is used for general purpose grouting 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.
- Pre-packed 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
- Economical

TECHNICAL DATA

COMPRESSIVE STRENGTH

The following results were obtained with water addition of 4.5 litres per 25kg bag.

Compressive Strength (Test Method BS 1881: part 116 1983)	**Typical result (MPa)**
1 day	26
7 days	55
28 days	64

FLEXURAL STRENGTH

Flexural Strength (Test Method BS 4551 1980)	**Typical result (MPa)**
1 day	2.5
7 days	9.0
28 days	10.0

MAXIMUM FLOW DISTANCE

Grout consistency	Max. flow distance in mm		
	Gap width mm	100mm head	250mm head
Flowable	20	900	1400
	30	1400	2300
	40	2000	2600
	50	2600	2800

EXPANSION CHARACTERISTICS

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

- Expansion start : 15 minutes
- Expansion finish : 2 hours

FRESH WET DENSITY

Approximately 2235 kg/m^3 depending on actual consistency used.

YOUNG'S MODULUS

ASTM 469-83 : 28 kN/mm^2

APPLICATION METHOD

1. Preparation

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 cut back to a sound base. Bolt holes and fixing pockets must be blown clean of any dirt or debris.

2. Pre-soaking

Several hours prior to grouting, the area of cleaned foundation should be flooded with fresh water. Immediately before grouting takes place any free water should be removed with particular care being taken to blow out all bolt holes and pockets.

3. Base Plate

It is essential that this is clean and free from oil, grease or scale. Air pressure relief holes should be provided to allow venting of any isolated high spots.

4. Levelling Shims

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

5. 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.

6. Unrestrained Surface Area

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

7. Mixing

For best results a mechanically powered grout mixed should be used. When quantities up to 50kg 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 labour are available. The use of a grout holding tank with provision to gently agitate the grout may be required.

8. Consistency of Grout Mix

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

- Trowellable : 3.4 - 3.6 litres
- Flowable : 4.0 - 4.5 litres

The selected water content should be accurately measured into the mixer. The total contents of the Capcem™ GP 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.

9. Placing

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

Capcem™ GP can be placed in thicknesses up to 100mm in a single pour when used as an underplate grout.

For thicker sections it is necessary to fill our Capcem™ GP with well graded, silt-free aggregate to minimise 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 flow 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.

10. 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 pre-soaking water becoming trapped under the baseplate. 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 Capcem™ GP may be pumped. A heavy-duty diaphragm pump is recommended for this purpose. Screw feed and piston pumps may also be suitable.

11. Curing

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

12. Cleaning

Capcem™ GP should be removed from tools and equipment with clean water immediately after use.

SAFETY INSTRUCTIONS AND LIMITATIONS

Capcem™ GP is alkaline and should not be allowed to come into contact with skin and eyes. Avoid inhalation of dust during mixing. Gloves, goggles and dust masks should be worn. If contact with skin occurs, wash with water. Splashes to eyes should be washed immediately with plenty of clean water and medical advice sought. Capcem™ GP is non-flammable. Refer to Material Safety Data Sheet.

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.

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

PACKAGING AND TRANSPORTATION

Capcem™ GP is supplied in 25 kg moisture resistant bags.

Allowance should be made for wastage when estimating quantities required.

The approximate yield per 25 kg bag for different consistencies is:

Consistency	Trowellable	Flowable
Yield (litres)	12	13.25

STORAGE AND SHELF LIFE

Capcem™ GP 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.

DISPOSAL

Follow local regulations.

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