

Penacrete

General purpose non-shrink cementitious grout

USES

Penacrete 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.
- 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.

DESCRIPTION

Penacrete is supplied as a ready to use dry powder. The addition of a controlled amount of clean water produces a flowing nonshrink grout for gap thicknesses up to 100mm.

Penacrete 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.

PROPERTIES

The following properties were obtained at a water : powder ratio of 0.20 and temperature of 20°C

Typical Properties

Compressive strength	25MPa @ 1 day 45 MPa @ 7 days 58 MPa @ 28 days
Flexural Strength	2.5 MPa @ 1 day 9.0 MPa @ 7 days 10.0 MPa @ 28 days
Time for expansion Start: Finish:	5 minutes 2 hours
Fresh Wet Density	Approximately 2160 kg/m ³ depending on the consistency used
Young's Modulus	25 GPa
Expansion characteristics	An expansion of up to 1% overcomes plastic settlement in plastic material.
Setting Times Initial Final	165 minutes 270 minutes

SPECIFICATION CLAUSES

Performance specification

All grouting shown on the drawing must be carried out with a pre-packaged cement based grout which is chloride free.

It shall be mixed with clean 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 40 MPa at 7 days and 55 MPa at 28 days.

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

Supplier's specification

All grouting where shown on the drawing must be carried out using Penacrete as manufactured by Aftek and used in accordance with the manufacturer's data sheet.

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PENACRETE

APPLICATION INSTRUCTIONS

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

Presoaking

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.

Base plate

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

Levelling Shims

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

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 a sacrificial semi-dry sand and cement formwork. The formwork should contain outlets for presoaking.

Unrestrained surface area

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

MIXING AND PLACING

Mixing

For best results a mechanically powered grout mixer 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.

Consistency of mixed grout

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

Trowellable	3.8 - 4.0 litres
Flowable	4.8 - 5.0 litres

The selected water content should be accurately measured into the mixer. The total contents of the Penacrete 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.

Placing

At 20°C, place the grout within 20 minutes of mixing to gain the full benefit of the expansion process. Penacrete 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 out Penacrete 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 of grout must be regulated to the time to prepare the next one.

Pouring should be from one side of the void to eliminate any air or presoaking water from being trapped under the baseplate. It is advisable to pour the grout across the shortest distance of travel. The

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grout head must be maintained at all times so that a continuous grout front is achieved.

Where large volumes have to be placed, Penacrete 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 a Curecon curing membrane, continuous application of water and/or wet hessian.

CLEAN UP

Penacrete should be removed from tools and equipment immediately after use. Cured material can only be removed mechanically.

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 mixing the grout prior to placement.

Store bags of Penacrete under cover and keep as cool as possible.

ESTIMATING

PACKAGING

Penacrete is supplied in 25kg moisture resistant bags.

Yield

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

Consistency	Trowel	Flowable
Yield (litre)	14	15

Storage

Penacrete 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.

PRECAUTIONS

Health and safety

Penacrete contains cement powders which, when mixed or become damp, release alkalis which can be harmful to the skin. During use, avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing, gloves, eye protection and respiratory protective equipment. The use of barrier cream provides additional skin protection. In case of contact with the skin, rinse with plenty of clean water, then cleanse with soap and water.

In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice.

If swallowed, seek medical attention immediately - do not induce vomiting.

Material Safety Data Sheets (MSDS) are available to users of Aftek products on request to nearest Aftek distributor. Read MSDS, data sheet and label carefully before first use of any product.

Fire

Penacrete is non-flammable.

TECHNICAL SUPPORT

Aftek offers a comprehensive range of high quality, high performance construction products. In addition, Aftek offers technical support and on-site advice to specifiers, end users and contractors.

NOTE

All reasonable care is taken in the compilation of this data sheet. All recommendations regarding use are made without guarantee as the conditions of use are beyond the control of the manufacturer.

PENACRETE

ALLIED PRODUCTS

Atek manufactures a broad range of construction products including.

Grouts

Coatings

Admixtures

Adhesives

Sealants

Floor Toppings

Floor Levelling Compounds

Concrete Repair