

technical data sheet

TECHFLOW GROUT HES

Class C Rapid Setting Cementitious Grout

PRODUCT

Techflow Grout HES is a high performance, high early strength, non-shrink dual expansion Class C cementitious grout.

DESCRIPTION

Techflow Grout HES is a high performance, high early strength non-shrink Class C cementitious grout. The highly fluid free flowing grout is a blend of Portland cement and graded aggregate which complies with US Corps of Engineers Specification of non-shrink grout, CRD-C621-82A and ASTM C1107-91 (Type C). Dual expansion compensates for shrinkage in both plastic and hardened states. For grouting gap distances 10mm to 90mm in a single application.

Techflow Grout HES is supplied as ready to use dry powder requiring only the addition of a controlled amount of clean water to produce a free flowing non-shrink grout.

RECOMMENDED USES

- Cementitious grouting where high early strength is required
- Critical equipment base plates
- Heavy duty support beneath machine base plates
- Precast wall panels, beams and columns
- Anchoring bolts, bars and fittings
- Underpinning
- Bridge bearing and crane rails
- Applications subject to continuous vibrations and dynamic loads
- Precision grouting application.

FEATURES & BENEFITS

- Dual expansion compensates for shrinkage in the plastic and hardened state
- Gaseous expansion system compensates for shrinkage and settlement whilst in the plastic state
- Can be poured or pumped
- Economical, low in place cost
- Ready to use, pre-mixed, requires only the addition of water
- Non metallic iron content eliminates staining
- Lower water/cement ratio reduces drying shrinkage, increases durability and reduces permeability
- Excellent flow characteristics when used in fluid consistency, fills intricate cavities
- Complete void filling resulting from gaseous expansion in plastic state
- Complies with the requirements ASTM C1107-91 and CRD-C-621-82A
- Rapid strength gain facilitates for rapid installation and operation of plant within matter of hours
- Equipment and machinery may be placed in service in 2 hours

PERFORMANCE PROPERTIES

Mixing Consistency

The table is a guide to the typical water addition requirements for various consistencies.

Litres of water per 20kg bag	Flowable	Fluid
Range	3.2 - 3.5	3.6 - 3.8
Test Levels *	3.5	3.8

* Refers to the water content used to carry out performance testing as indicated in the tables below.

Setting Times

Vicat setting times at 20°C	Flowable	Fluid
Initial Set	20 minutes	30 minutes
Final Set	30 minutes	40 minutes
Time for Expansion -Start (plastic state)	10-15 minutes	10-15 minutes
Time for Expansion -Finish (plastic state)	1 - 2 hours	1 - 2 hours
Unrestrained Expansion	1.0%	1.1%
Bleeding	0%	0%

Compressive Strength

Tested in accordance with AS1012.9, AS2073 at 20°C

Age	Flowable	Fluid
2 hours	30Mpa	24Mpa
4 hours	40Mpa	28Mpa
8 hours	45Mpa	32Mpa
24 hours	52Mpa	36Mpa
3 days	60Mpa	40Mpa
7 days	68Mpa	47Mpa
28 days	70Mpa	50Mpa

Flexural Strength

Tested in accordance to ASTM C348-86 at 20°C

Age	Flowable	Fluid
1 day	4.4Mpa	3.9Mpa
7 days	8.6Mpa	7.2Mpa
28 days	10.7Mpa	10.0Mpa

BOND STRENGTH

Tested in accordance to ASTM C882-1987 Slant/Shear method

Age	Consistency	Strength
7 days	Flowable	> 5Mpa
28 days	Flowable	>10Mpa

DRYING SHRINKAGE

Tested in accordance to AS1012.13

Time (days)	Consistency	Strength
7 days	Flowable	< 350 microstrain
28 days	Flowable	< 500 microstrain
56 days	Flowable	< 500 microstrain

FLOW CHARACTERISTICS

Using CRD-C flow core (Efflux time)

Initial Flow	20 - 30 seconds
Flow after 10 minutes	30 - 40 seconds

ABRASION RESISTANCE

Tested in accordance to ASTM C501-1984 (Taber Abrasion)

Age	Wear Index
28 days	120

COMPARISON CHART

Product	Wear Index	Classification (resistance to wear)
Ceramic Tile	142	Very High
(Bassalt) Bluestone	39	Poor
Concrete 30Mpa	36	Poor
Concrete 60Mpa	71	Low
Cast Iron	99	Low-High

YIELDS

The approximate yields are obtained if mixed in accordance with recommended procedures and accurately measured water content.

	Flowable	Fluid
Litres per 20kg bag	11.2	11.6
Fresh wet density kg/m ³	2098	2052
Bags required per cubic metre	89	86

Density tested to AS1012.5

PACKAGING

Techflow Grout HES is supplied in a 20kg polylined bag.

APPLICATION INSTRUCTIONS

SUBSTRATE AND SURFACE PREPARATION:

The substrate must be clean, sound and free from oil, grease, curing compound or any loose materials. It must be mechanically abraded back to a sound concrete. Bolts or anchor holes must be clean and free from dust or loose material. This can be achieved by blowing clean the hole.

PRE SOAKING:

It is essential to presoak the concrete substrate prior to application of Techflow Grout HES. Pre soak substrates for a minimum of 6 hours prior to grouting. Immediately before grouting, the excess water should be removed, all water in the anchor and bolt holes must be blown out and no traces of free water present whilst grouting.

BASE PLATE:

All traces of rust, oil or grease must be removed. It is essential to provide air pressure relief holes for venting.

FORMWORK:

It is essential that the formwork be constructed to facilitate rapid continuous and complete filling of area to be grouted. It is essential that the formwork constructed be leak proof and water tight. Use methods of forming that will allow grout to flow by gravity between the base plate and foundation ensuring grout is kept in full contact with these surfaces until it has hardened.

UNRESTRAINED SURFACES:

As Techflow Grout HES is an expanding grout, unrestrained areas must be kept to a minimum. It is advised not to have any unrestrained areas.

LOW TEMPERATURE WORKING:

Normal precautions for winter working with cementitious materials should then be adopted. At temperature below 5°C, the cure rate and strength development rate will be dramatically reduced. If early strength is required, it is advisable to use heated water and condition Techflow Grout HES to 25°C. Do not exceed these temperatures.

HIGH TEMPERATURE WORKING:

At temperatures above 30°C, it is advisable to use water below 20°C when mixing grout. All materials must be kept cool and away from direct sunlight with the installation area shaded by erecting shade screens. If ambient temperatures are excessive, perform grouting in early morning or late evenings.

MIXING

For optimum results, Techflow Grout HES must be mixed with a mechanical forced action mixer with a high shear stirrer. It is essential that the grouting operation is continuous therefore, ensure sufficient labour and mixing capacity is available.

DO NOT MIX BY HAND.

The selected water content should be accurately measured into a mixing vessel. Slowly add the dry powder, Techflow Grout HES while mixing. The mixing should continue for a maximum of 5 minutes until a uniform homogeneous consistency is obtained.

DO NOT ADD ADDITIONAL WATER.

Discard any unused grout that has stiffened or hardened in the mixing bucket.

PLACING

It is essential that at ambient temperatures (approximately 20°C) the grout is placed within 15 minutes of mixing as this will ensure the expansion process is maximised. Techflow Grout HES can be placed in thickness ranging from 10mm to 90mm in one single application.

Where thickness is greater than 90mm, special procedures may be necessary, such as the addition of Bostik Patchfix Fillers, Coarse or Fine (available from Bostik). This may be added at a rate of between 5.0 - 10kg per 20 kg bag of Techflow Grout HES.

DO NOT ADD EXCESS AGGREGATE AS THIS WILL EFFECT WATER CONTENT.

Consult your local Bostik office for advice.

Avoid trapping air and water by placing grout from one side only. It is recommended that a suitable head box be used to ensure continuous flow of grout.

Ensure entire area to be grouted is filled by bringing level to above underside of machine base plate and remain at this level throughout grout placement. The grout head must be maintained at all times so that a continuous grout front is achieved. Do not use mechanical vibrators to assist in flow as this will cause segregation of aggregate. For large areas it is recommended that Techflow Grout HES be pumped. Contact your local Bostik office for further information.

Sufficient grout must be available prior to starting and the time taken to pour a batch must be regulated to the time taken to prepare the next one.

CURING

On completion of grouting exposed area should be covered with wet hessian, plastic sheeting or Bostik Bond 'N' Cure to prevent excessive moisture loss. Keep grout covered for a minimum of 24 hours. Remove formwork no sooner than 24 hours after completion of grouting and continue to cure with wet hessian, plastic sheeting, water or Bond 'N' Cure curing agent. Lack of sufficient curing could result in plastic cracking and drying shrinkage on the surface. The surface should be protected for at least 7 days with either Bostik Bond 'N' Cure, wet hessian or plastic sheeting.

PRECAUTION

- Precision HES generates a moderate degree of heat when curing. areas greater than 90mm in thickness require special procedures. consult your local Bostik office for advice.
- The lower the water content used, the faster the cure rate and the shorter the working time and pot life. Special care must be taken at low water content.
- Do not apply in areas less than 10mm depth.
- Do not add excess water other than specified.
- Cure time and set time will be extended if applied at temperatures below 5°C.
- Do not apply in direct sunlight.

P.A.T.S. PROGRAMME (Pretested Adhesion to Substrate)

Bostik offer a service in which a program has been established to eliminate potential field problems by pre-testing Bostik adhesives with samples of building materials to which the adhesive will be applied. This service is available on large projects where pre-application testing will aid in determining the proper surface preparation method to achieve optimum adhesion. Consult a Bostik Representative for further information.

HEALTH AND SAFETY

Cement products are classified as hazardous under General Health and Safety guidelines. Materials containing Portland cement are alkaline in nature and you should during use avoid inhalation of dust and contact with skin and eyes. Suitable protective clothing, dust masks, gloves and eye protection should be worn. Continual or extended contact with cement products can cause skin irritation. If skin irritation occurs, remove contaminated clothing and wash skin thoroughly with water for a minimum of 15 minutes. Contact Poison Information Centre or consult medical advice. Refer to **Material Safety Data Sheet**.

CLEAN UP

Techflow Grout HES should be removed from tools and equipment with clean water immediately after use.

STORAGE

Techflow Grout HES has a shelf life of approximately eight (8) months if kept in a dry environment completely away from moisture.

FIRE

Techflow Grout HES is non flammable.

ITEM NO	STOCK SIZE	COLOUR
TECHFLOW GROUT HES		
267767	20kg	Light Grey
FLOWFILL GROUT GP		
267759	20kg	Grey
TECHFLOW GROUT HS		
267775	20kg	Grey
TECHFLOW EPOXY GROUT		
267783	4 litre kit	Grey
267791	16 litre kit	Grey

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The representations and recommendations regarding the products are based on tests which we believe to be reliable. However, no guarantee of their accuracy can be made because of the great range of field conditions and variations encountered in raw materials, manufacturing equipment and methods. Thus, the products are sold with a limited warranty only, and on the condition that purchasers will make their own tests to determine the suitability of the product for their particular purposes. Under no circumstances will Bostik Findley Australia be liable to anyone except for replacement of the products or refund of the purchase price.

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