



# FORMCEM

## Cementitious Systems

### FORMTIEPLUG

#### Fastset Tiehole Filler

##### Description

**FormTieplug** is a pre-packed polymer modified Portland cement based on established and comprehensively tested technology. Although specially packaged for the filling of tie holes, it can also be used for other general structural repair applications being thixotropic in the plastic state and curing to give shrinkage compensated, waterproof mortar with exceptional compressive and adhesive strengths.

##### Benefits

- A pre-blended product in ready to use economy pack.
- Fast setting with simplicity of use – no special equipment needed.
- Waterproof in hours.
- Shrinkage compensated.
- No special curing requirements.
- Minimal surface preparation – can be used in cold and damp conditions. (Underground, etc.)
- Wide application temperature range 5°C – 35°C.
- Complete compatibility with existing concrete ensuring excellent monolithic performance.
- Free of chlorides and risk of alkali silica reactions.
- Gives protection against acid gasses, moisture ingress and chloride attack.
- Provides good surface finishes and excellent colour matching can be achieved in conjunction with Fastpatch cements.
- National water council listed product (UK WRAS Certification)
- Complies with Clause 6, of DTp Standard BD 27/86 “Materials for the repair of Concrete Highway Structures”.

##### Technical data

Appearance: Grey powder  
Mixed density:  
2200 Kg/m<sup>3</sup>.

Compressive Strengths (N/mm<sup>2</sup>) BS 4551: 1980  
2hrs 14-17, 4hrs 21-25, 24hrs 38-42,  
7days 50-54, 28days 58-64.

All figures based on average of a number of sample cubes tested. W/C ratio 14%.

Tested at 20°C and 100% RH.

Average Bond Strength at 28days: 51 N/mm<sup>2</sup>

BS 6319 Part 4: 1984 Slant/shear method.

Shrinkage compensation: 0.007% at 28 days without curing assistance and in a free unrestrained situation.

Initial Set/Working Life: 15 to 20 minutes at 20°C

Dependant upon ambient temperature and water content.

Application Temperature: Minimum 5°C, maximum 35°C NB. For overseas temperatures in excess of these we produce a Tropical Grade.

Application Thickness: Minimum 5mm, maximum 50mm in vertical/soffits situation

Single Hole fill (maximum) 60mm x unlimited.

Volume (maximum) 1m<sup>2</sup> x 50mm

Coefficient of thermal expansion

Coefficient is fully compatible with normal concrete.

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### Application

#### Surface Preparation

Ensure tie hole or repair is clean and free from any deleterious substances. Any oils or greases, etc. can be removed using Degreaser. The ideal contamination free concrete surface is one that has been cast in formwork using Extracran chemical release agent.

Before filling of through tie holes, ensure any remaining plastic tube is removed or drilled back to approximately 40-50mm from concrete faces and that the hole is plugged by cork or proprietary stopper prior to filling with **Tieplug**. This will eliminate the possibility of water tracking around the plastic tube.

If using Tieplug in a repair situation, the reinforcement should be cleaned and dimensionally checked. However no priming of any exposed steel is necessary as form **Tieplug** is a totally waterproof system with high alkalinity.

**Formtieplug** does not use a separate primer system. It is only necessary to ensure the hole/repair is thoroughly saturated with clean water, removing any excess surface water prior to filling or commencing a repair.

- N.B.
1. If concrete to be repaired is new (hours old) use warm water to prevent thermal shock.
  2. Never repair a substrate with a strength less than 20N/mm<sup>2</sup>.
  3. Check ambient temperature is between 5°C and 35°C.

### Mixing

Mix Only enough **Formtieplug** as can be used in a period of 15-20 minutes (dependent upon ambient temperature). For accuracy use measuring scoop provided, and guide mix ratios below, to proportion material. Always add powder to water to ensure ease and thoroughness of mixing without ingress of air.

For large quantity mixes (over 8Kg) at one time mix thoroughly by mechanical means (slow speed drill and paddle) to obtain a cohesive thixotropic material. Do not attempt to remix mortars by the addition of more water after initial mixing process is completed. Clean equipment and any spillage with water immediately after use.

### Application

Colour and texture matching of tieholes to the existing concrete surface can be achieved by using Fastpatch cements that are supplied in grey and white formulations. These can be used individually or blended in conjunction with fine aggregate used in the existing concrete (necessary for colour), to achieve a perfectly matched finish. Apply this surface finishing layer within a period of 2-24 hours if possible; this is to achieve the optimum chemical bond. Always „cross hatch“ the previous layer of **Formtieplug** and allow a depth of 10 to 15 mm for the final finishing layer.

Alternatively take 20% by volume cement/fines paste from a fresh batch of site concrete mix, add to final **Tieplug** layer mix and use to fill last 10 – 15mm depth from hole surface. Smooth finish with a dampened steel trowel. This technique will give a reasonable colour match but must be carried out at the time of filling the rest of the hole.

### Cleaning

Always keep equipment clean, washing off **Formtieplug** mixes with water before they have set. If allowed to set, mechanical cleaning will be required.

### Curing

**Formtieplug** cement used in small repairs does not normally require curing. However, for large repairs, or use in hot climatic conditions, normal concrete curing techniques are recommended, i.e. damp hessian or white polythene sheet.

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### Coverage Tables

#### SHE BOLT TYPE

Tie Rod Cover (mm)	She Bolt Size (in)	Tie Rod Size (in)	No. of holes per 8Kg pack
38	1 1/4	3/8	88
	1	5/8	
	3/4	1/2	247
50	1 1/4	3/4	72
	1	5/8	117
	3/4	1/2	200

### Packaging

8Kg self-seal tubs with polybag liner plus one plastic measuring scoop.

### Storage

No precautionary label requirements. Store in dry conditions where possible and always reseal tubs after use.

**Formtieplug** is supplied with double protection consisting of polybags and sealed tubs, ideally suited for transportation and storage even in the most difficult climatic conditions.

### Health & Safety

The principle ingredient of **Tieplug** is modified Portland cement, non-toxic but alkaline;

Irritating to eyes, respiratory system and skin.

Risk of serious damage to eyes.

Keep out of reach of children.

In case of contact with eyes, rinse immediately with plenty of soap and water.

Wear suitable protective clothing, gloves and eye/face protection.

Separate **Formtieplug** Health & Safety Sheet is available on request.

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