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Natural Cement

SHOTCRETE 513

FAST SETTING DRY SPRAY CONCRETE

INSTRUCTION FOR USE

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SHOTCRETE 513 - FAST SETTING DRY SPRAY CONCRETE

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This Instructions For Use document is prepared specifically for Water Companies for use with drinking water only

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Approval

SHOTCRETE 513 is approved under regulation 31 of the Water Supply (Water Quality) Regulations 2016.

The product is included in the List of Approved Products for use in Public Water Supply in the United Kingdom.

The List of Approved Products is available on the Drinking Water Inspectorate's website www.dwi.gov.uk/drinking-water-products/approved-products/index.htm

Product Description and Scope of Use

SHOTCRETE 513 is a fast setting and curing, rapid strength gain dry spray concrete consisting of a blend of unique natural cement based binder, specially selected and dried loose graded aggregates all passing a 2mm sieve. SHOTCRETE 513 is intended for use for horizontal and vertical concrete repairs on drinking water applications where high early strength is required.

Features

- Fast setting.
- Fast curing.
- Excellent adhesion.
- Low modulus of elasticity excellent for loose or friable substrates.
- Low shrinkage.
- Excellent resistance to drinking water.
- Very good cohesion & mixing.
- No curing membrane necessary.
- Can be used in wet conditions.

Packaging and Storage

Packaging

SHOTCRETE 513 is packaged in a polyethene inner bag complete with a re-sealable tie, within a stich sealed woven polypropylene outer bag. Bag Weight: 25kg

Storage

Unopened bags of SHOTCRETE 513 should be stored in dry conditions and will remain usable for a minimum of 12 months.

Method of Use

Preparing the surface

Do not use on frozen or over heated substrates (outside the range of 7°C - 30°C). Prepare the surface in advance of application to provide an adequate key. It should be clean, free from dust and thoroughly dampened. Where necessary steel or aluminium mesh can be used. Ensure that a 10mm minimum thickness of material is obtained.

Priming

There is no need to prime any reinforcement, but if priming is preferred, any conventional system may be used.

Mixing

For optimum results prepare the mix using conventional dry spray mixing machines. 3.6 litres of water should be added to each 25kg bag. Exceeding this ratio will lead to lower initial strength, longer setting time and the risk of surface cracking appearing.

SHOTCRETE 513 should be added to a dry spray machine and transported by dry air to the nozzle where the water is added. To obtain low dust levels and consistent mixing qualities it is advisable that the water is added to the SHOTCRETE 513 approximately 1.5 metres from the end of the nozzle. In cold weather the set can be accelerated using warm water (up to 20%°c); alternatively, in hot weather, cold water can be used to slow down the set.

Yield

Generally, 1 x 25 Kg bag of SHOTCRETE 513 mixed with a water/cement ration of 3.6 litres per one 25kg bag will produce approximately, 10 litres of finished mortar.

Application

10 mm minimum thickness of the material is always necessary. Once setting has started. DO NOT attempt to re - mix or to smooth the surface with water. This will cause the mechanical properties in particular strength, adhesion to be lost and possible surface cracking.

Do not premix SHOTCRETE 513 with water before placing in the dry spray machine. Carry out the removal of all loose material from the concrete and reinforcement. It is only necessary to remove rust from the reinforcement.

Prepare the surface as described previously, ensuring the surface is well dampened but also ensuring there is no standing water. Fix any necessary reinforcement, movement joints and formwork. Add the dry SHOTCRETE 513 powder continuously to the dry spray applicator machine with the water being added and controlled at the nozzle ensuring that the SHOTCRETE 513 is worked around any reinforcement.

Setting Times

At 20°C SHOTCRETE 513 is designed to commence setting at 4 minutes after mixing and finish setting at 10 minutes.
In winter SHOTCRETE 513 can be used down to 7°C. The set will be slower but can be accelerated by with warm water (20°C). In very hot temperatures the set will be faster and can be slowed by using cold water.

The setting curve below (Fig. 1) shows setting times at ambient temperatures of 20°C and 7°C

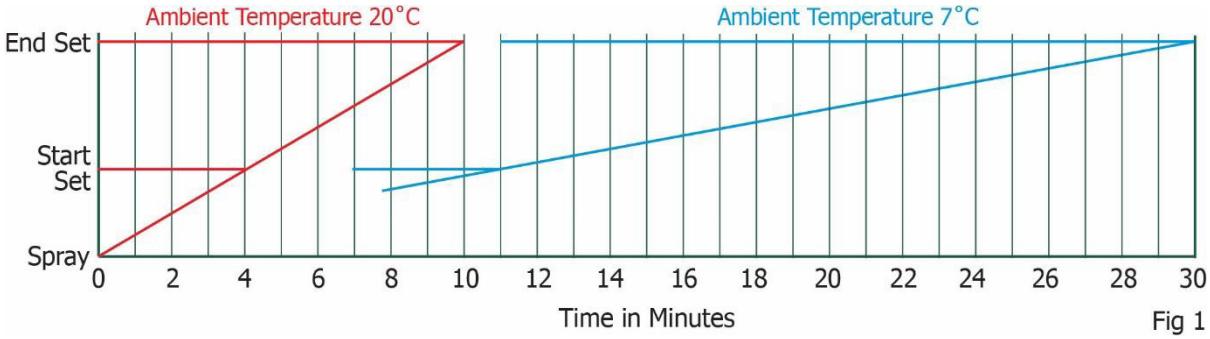

Fig 1

After the product has set, a minimum curing time of 1 hr must elapse before returning to service

Strength Gain

After setting is complete the material will continue to gain strength over time. A Flexible Strength gain curve and a Compressive Strength gain curve are shown below (Fig 2). The range shown extends up to 28 days but the strength continues to develop thereafter.

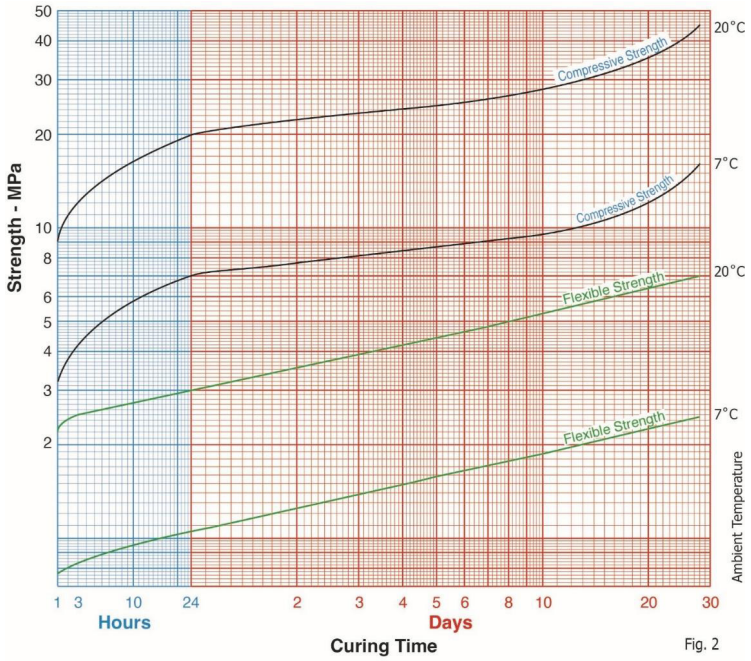

Fig. 2

Cleaning

SHOTCRETE 513 should be removed from tools and equipment with water immediately after use.

Disinfection

Disinfection of SHOTCRETE 513 is not necessary, the material may be returned to service without further attention. The water utility may, however, wish to introduce a disinfection procedure and further testing prior to return to service at its own discretion.

Waste Disposal

Empty bags

Empty polyethylene inner bags and polypropylene outer bags can be returned to the user's stores for recycling.

Alternatively, they can be disposed into a skip destined for recycling.

Waste material

Dispose of waste material in compliance with local by-laws, national legislation and/or EC regulations

Material after the addition of water – hardened overspray

Dispose of the hardened product as concrete waste. It is a non-hazardous material and may be disposed of in appropriate landfill sites.

Avoid introduction of this material into sewer systems, waste water disposal networks and water courses.

Material – unused residue or dry spillage

Pick up dry. Mix with water and allow to harden. Dispose of as in 3 b) i above.

Safety

Wear suitable protective clothing when handling bags and mixing the material.

Wear safety glasses, work gloves and dust mask.

Avoid spillage from damaged bags

Avoid breathing the powder

Avoid raising dust especially when sweeping. Always add the powder to the water to avoid raising dust.

Avoid skin contact with the wet concrete during the setting reaction.

Discard immediately any clothing which becomes saturated with wet cement
It is important to read the SHOTCRETE Material Safety Data Sheet (MSDS) for full details prior to using the material.

The MSDS is available on request from Natural Cement Distribution Ltd.
Contact details are shown on Page 2 of these Instructions