CI/SfB | | Yq2 |
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construction solutions

Shrinkage-compensated, high-strength, flowing repair concrete

Five Star* repair concrete

About this product

Five Star repair concrete is a preblended cementitious repair concrete which fully complies with the Highways Agency Specification for Highway Works and Department of Transport specification BD 27/86 for a high strength flowing concrete. Contains non-reactive aggregates and a low soluble alkali cement content. The repair concrete can be applied to a range of thicknesses, minimum 15 mm. Contains RHPC & PFA to clause 1702, 5 mm non-reactive carboniferous limestone to clause 1704, microsilica and shrinkage compensating agents.

Technical data

The following test results were obtained in lab conditions at 20°C			HA spec
Working time	45 – 60 minutes		
Set time	300 minutes		
Plastic density	2200 kg/m³		
Water/cement ratio (3·3 litres per 25kg)	0·37		max 0·4
Flow trough			
at 5°C immediately after mixing	750 mm in 5 sec		750 mm in 30 sec
at 5°C 30 minutes after mixing	750 mm in 6 sec		
at 20°C immediately after mixing	750 mm in 5 sec		750 mm in 30 sec
at 20°C 30 minutes after mixing	750 mm in 6 sec		
Flow in simulated soffit and top repair	At 5°C and 20°C		Complies
Compressive strength BS 6319: Pt 2	**5°C**	**20°C**	
1 day		16 N/mm²	
3 days		35 N/mm²	
7 days		45 N/mm²	
10 days	35 N/mm²		min 29 N/mm²
28 days	–	65 N/mm²	min 50 N/mm²
Cement content	500 kg/m³		min 400 kg/m³
Air content	2·8%		max 7%
Tensile strength BS6319: Pt 7 (7 days)	> 4 N/mm²		
Bond strength	> 2·5 N/mm² (failure of concrete)		
Static modulus of elasticity	28 – 32 kN/mm²		
Coefficient of thermal expansion	6 – 10 x 10^{-6} mm/mm/°C		
Coefficient of chloride ion diffusion	1·5 – 2·5 x 10^{-13} cm² s^{-1}		

Uses

- Repair of concrete to bridge structures to HA model specification BD 27/86
- Replacement of concrete to beams and crossheads
- Repair of car parks, buildings, balconies and stairs
- Coastal structural repairs and seawall reconstruction
- Repairing concrete columns, beams, walls and soffits
- Infill concrete and anchorage of bolts to large bolt pockets
- For use under baseplates where thick sections are required to be grouted: 75 to 500 mm

Features and benefits

- Permanent structural repair concrete
- Rapid strength development thus reducing repair possession times
- Dimensionally stable, forms an integral bond to existing concrete and restores structural integrity with proven durability
- Economical repair
- Variable application thickness providing flexibility of use
- Free-flowing repair concrete allowing formation of intricate falsework
- deally suited in structural elements where reinforcement is congested
- Shrinkage-compensated to avoid shrinkage cracks and enhance durability

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Preparation

The concrete substrate shall be adequately prepared by suitable methods to remove all defective concrete or suspect concrete by high pressure water cutting or by mechanical means, i.e breakers, scabbling, grit blasting, etc. The perimeter of the prepared area shall be well defined by a saw cut, avoid feather edging of the repair concrete. All concrete shall be removed to give a minimum clear dimension of 20 mm to all exposed rebar reinforcement. The extent of the concrete removal shall be agreed with the contract supervisor or engineer.

Rust scale corrosion products and other deposits shall be removed from the exposed steel reinforcement by grit blasting or high pressure water cutting. Finish shall be to achieve second quality to BS 7079:1989 which is equivalent to Swedish Standard SA 2½ quality. Degrease with **weber.tec solvent 3** where appropriate immediately prior to pouring. No priming of the reinforcement is required, **Five Star repair concrete** forms a good cementitious bond to the clean exposed reinforcement.

Old concrete surfaces contaminated with oil or grease will require cleaning, care must be taken to ensure all contamination and any coating is removed prior to application of concrete.

Grout-tight formwork is essential. Use a light uniform application of release agent and good quality sealed ply formwork. The formwork shall be adequately supported and fixed to resist fluid concrete pressures. The parent concrete shall be thoroughly saturated with potable water prior to the application of the repair concrete. This may be achieved by filling the formwork with water, usually for 2 hours, then draining off the water and removal of all surplus water.

Mixing

Use only freshly opened bags of **Five Star repair concrete** and a clean forced-action mixer of suitable volume, i.e Daines Mixal mixer, Cretangle pan mixer or a Putzmeister P13 mixer and pump.

Charge the mixer with 3·1 – 3·3 litres of water per 25 kg bag, followed by a gradual addition of repair concrete. For optimum flow use 3·3 litres of water. Mix for 3 minutes. Mix only full bags, do not mix part bags.

NB: do not exceed maximum water addition of 3·3 litres water per 25 kg bag.

Application

The mixed concrete shall be used within 30 minutes of mixing and kept agitated prior to use.

The mixed concrete can be placed either by gravity pouring or by pumping through hoses at least 50 mm diameter. Care shall be exercised to avoid air entrapment during placing. No vibration is needed to compact the repair concrete but the formwork should be tapped with a mallet to release minor air bubbles on the surface of the formwork.

Setting time

Setting time at 20°C is approximately 225 minutes.

Winter working

Five Star repair concrete can be used down to 5°C provided cold weather working precautions are carried out. At low temperatures the strength development gain of repair concrete is greatly reduced with strengths similar to that expressed by the Sadgrove method. Striking times of formwork will be effected.

For further information please contact **Weber** Technical Services.

Curing

Immediately after finishing, the exposed surfaces of the concrete shall be cured with wet hessian, polythene or frost blankets for at least 48 hours to prevent rapid loss of water.

The formwork shall not be removed until the repair can support the dead and imposed loads, normally 48 hours at temperatures above 15°C and 72 hours at lower temperatures.

The concrete shall then be cured with a spray-on curing membrane, **weber.tec ritecure**, for a minimum of 14 days. Protect repairs from frost and ice formation.

Packaging

Five Star repair concrete is supplied in 25 kg bags.

Coverage

Yield per 25 kg bag is 12·75 litres
Coverage per m³ volume is 78 bags of **Five Star repair concrete**.

Storage and shelf life

When stored unopened in a dry place at temperatures above 5°C, shelf life is 12 months from date of manufacture.

Health and safety

Contains cement (Contains chromium (VI). May produce an allergic reaction). Harmful by inhalation. Irritating to eyes and skin. Keep out of the reach of children. In case of contact with eyes, rinse immediately with plenty of water and seek medical help. After contact with skin, wash immediately with plenty of soap and water. Wear suitable protective clothing, gloves and eye/face protection.

For further information, please request the Material Safety Data Sheet for this product.

Technical services

Weber's Customer Services Department has a team of experienced advisors available to provide on-site advice both at the specification stage and during application. Detailed specifications can be provided for specific projects or more general works. Site visits and on-site demonstrations can be arranged on request.

Technical helpline
Tel: (01525) 722110
Fax: (01525) 718988

Sales enquiries

Weber products are distributed throughout the UK through selected stockists and distributors. For UK sales enquiries and overseas projects, contact **Weber's** Sales office.

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