

**Polymer-modified, dry-spray, structural repair concrete, with fibre-reinforced option**

# weber.cem spray DS/DSF

## multifix spray concrete DS/DSF



### Uses

#### weber.cem spray DS

- Repairs to large areas of structural concrete
- Repairs of highway structures: bridge columns, piers, deck soffits, beams, abutments, parapets, retaining walls, tunnels and viaducts
- Repairs of marine structures: jetties, piers, quays, seawalls, concrete offshore platforms, docks and drydocks
- Repairs of fire damaged concrete structures
- Sealing of mine roadways and tunnels
- Structural enhancement of mineshafts
- Structural encasement of steel sections, pylons, chimneys, cooling towers
- Rock and embankment stabilisation

#### weber.cem spray DSF (as above, plus)

- Thin concrete overlays 25 – 50 mm on columns, beams and soffits
- Increasing cover to steel in RC structures

**weber.cem spray DSF** has been designed specially for use in thin sections, but this does not preclude its use in much thicker sections up to 300 mm.

**weber.cem spray DS** is more economical and therefore better suited for use in thicker sections, but additional reinforcement will be needed.

### About this product

**weber.cem spray DS** is a ready-to-use, polymer-modified, cement-based concrete mix. It contains inert limestone aggregates and dust suppressants. The formulation has been designed specially for dry process spray application to give high early strength, reduced rebound and maximise application thickness.

**weber.cem spray DSF** also contains alkali resistant glass fibres. It has been designed to give higher tensile and flexural strengths, increased resistance to impact and abrasion, reduced rebound and to minimise application thickness. The fibres help to reduce shrinkage cracking.

### Technical data

The values given below are indicative of typical properties that are achievable in good conditions by an experienced contractor. All the tests have been carried out on actual sprayed samples – not reconstituted mixes

		spray DS	spray DSF
Dry density		2150 – 2300 kg/m <sup>3</sup>	2250 – 2350 kg/m <sup>3</sup>
Initial set		2 – 3 hours	2 – 3 hours
Drying shrinkage (BS 6073-1:1981)	5 days	0.065%	0.05% – 0.06%
	28 days	0.055%	
	70 days	0.040%	
Water permeability		< 10 <sup>-11</sup> m/s	< 10 <sup>-11</sup> m/s
Chloride penetration (Taywood Technology profile grinding method)		0.5% at 2.5 mm	< 0.1% at 5 mm
		0.08% at 5 mm	
		0.02% at 10 mm	
Chloride ion diffusion (Taywood Technology bulk diffusion method)	20°C	236 x 10 <sup>-15</sup> m <sup>2</sup> /s	1.5 – 2.5 x 10 <sup>-13</sup>
	40°C	946 x 10 <sup>-15</sup> m <sup>2</sup> /s	
Coefficient of thermal expansion		6 – 10 x 10 <sup>-6</sup> /°C	9 – 10 x 10 <sup>-6</sup> /°C
Bond to concrete (BS EN 1542:1999)	28 days	2.4 MPa	> 2.0 N/mm <sup>2</sup>

### Strengths

Compressive (tested on cores to BS EN 12390-3:2002 at 20°C)	7 days	49.8 MPa	45 – 55 N/mm <sup>2</sup>
	28 days	56.3 MPa	55 – 65 N/mm <sup>2</sup>
Flexural (Tested on cut prisms to BS 1881-118:1983)	28 days	9.8 MPa	10 – 11.5 N/mm <sup>2</sup>
Tensile splitting (Brazilian Method to BS 1881-117:1983)	28 days	5.5 MPa	5 – 6 N/mm <sup>2</sup>
Static modulus of elasticity in compression (BS 1881-121:1983)	28 days	32.9 kN/mm <sup>2</sup>	30 – 33 kN/mm <sup>2</sup>

### Features and benefits

#### weber.cem spray DS

- ▲ Economical – low rebound
- ▲ Safe to use and handle. Relatively low dust emission, no siliceous aggregates, no caustic accelerators
- ▲ High-build – up to 150 mm thickness can be applied in one pass on vertical and overhead faces without any additional mesh reinforcement
- ▲ Rapid strength gain
- ▲ Low permeability to water and chlorides
- ▲ Low chloride ion diffusion: better protection of reinforced concrete marine structures
- ▲ Complies with Highways Agency specifications for repairs to highway structures

#### weber.cem spray DSF (as above, plus)

- ▲ Fibres provide crack control, better strain relief and stress distribution. Less visible cracking and crazing
- ▲ Alkali resistant glass fibres – better mechanical properties than polypropylene fibres – lighter, easier to use and safer to handle than steel fibres and do not rust
- ▲ Thin overlays 25 – 50 mm on columns, piers and walls without need for mesh, providing extra cover to steel
- ▲ Increased tensile strength and impact resistance, can be used for protection

# weber.cem spray DS/DSF

## Preparation

As with all repairs and applications it is essential to apply to a clean, sound surface free from all grease, oil, dust and loose material.

### Concrete

Concrete substrates must be adequately prepared by a suitable mechanical method such as scabbling, grit blasting, water jetting or needle gunning, or by such other means as appropriate. Concrete must be carefully prepared to give a clean, freshly-exposed surface. The outer limits of concrete patches should be cut square to avoid feather edges.

Old concrete surfaces contaminated with oil or grease must be cleaned with a suitable detergent. Care must be taken to ensure that the oil or grease is removed from the surface and not simply spread over a larger area.

### weber.cem spray DS

The designer may require the sprayed concrete to be reinforced with mesh or bars. Reinforcing bars greater than 25 mm should be avoided. Mesh helps to evenly distribute stresses due to thermal movement or shrinkage and reduces the risk of cracking especially on corners. The mesh should be fixed in accordance with the recommendations in Concrete Society Technical Report No. 15.

### weber.cem spray DSF

When using this fibre-reinforced concrete in thin sections, from 25 mm to 50 mm, provided that the substrate has been adequately prepared to give a good bond and considering other factors, there is no need to use mesh unless it is specifically requested by the Engineer.

Soak the concrete surface thoroughly, allowing surplus water to drain off.

### Steel substrates

Steel substrates, including exposed reinforcement, should be free of loose rust and grease. Ideally they should be grit blasted to a uniform grey metal finish to achieve first quality to BS 7079-A1 followed by degreasing with a suitable solvent immediately prior to bonding.

Any formwork or extra reinforcement such as steel mesh should be designed/prepared and fixed in accordance with the guidelines of the Code of Practice (see below).

## Application

**Guidelines on the method of working are detailed in the Code of Practice for Sprayed Concrete published by the Concrete Society and should be strictly observed.**

**weber.cem spray DS/DSF** should be emptied from the bags directly into the hopper of the dry process spraying machine. The equipment should be balanced so as to produce a steady stream of material with minimal pulsing.

The amount of water added at the spraying nozzle will be controlled by the nozzle man – too low an addition will increase rebound and dust emission; too wet a mix will slump. The correct amount of water can be judged by the appearance of the sprayed concrete; any glossiness of the surface should be avoided.

In case of a long delay between applied coats of the sprayed concrete, the surface of the newly applied hardened concrete should be water jetted using maximum air pressure and water flow through the nozzle to ensure that any laitance and all weak or loose material has been removed.

The surface should be allowed to drain before proceeding with the next coat.

**weber.cem spray DS/DSF** can be applied down to 15 mm thickness but, because of the higher cement content, (due to aggregate loss through rebound) there is the likelihood of greater shrinkage. The recommended minimum thickness is 25 mm. The recommended minimum thickness for protection over steel is 40 mm.

### Finishing

Any necessary trowelling or profiling should be done immediately after spraying has finished.

An 'as-sprayed' appearance is recommended, but if overcoating is to follow, finish with a wooden float or damp sponge. Avoid the use

of steel floated finishes as these normally result in crazing and cracking. The effect is, however, much less with this product.

### Curing

This product must be properly cured if it is to achieve its optimum properties. Cure immediately with **weber.tec ritecure** unless the surface is to be overcoated or subject to chemical impregnation, in which case cure with polythene sheeting and/or wet hessian for a minimum of 3 days.

**Protect from frost.**

## Packaging

**weber.cem spray DS/DSF** are supplied in 25 kg polylined paper sacks.

## Yield

Approximately 11.5 litres per 25 kg bag, but allowance must be made for rebound and profiling.

## 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.

### Sales office

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