



STRUCTURAL CONCRETE® V/O

Vertical/Overhead Permanent Repair

PRODUCT DESCRIPTION

Five Star Structural Concrete® V/O is a high early strength, single component, permanent concrete repair material for vertical and overhead structural repairs. Five Star Structural Concrete® V/O produces a repair which is dimensionally stable, develops an integral bond to existing concrete, and restores structural integrity within hours of placement. Five Star Structural Concrete® V/O provides increased corrosion protection to steel reinforced structures with migrating corrosion inhibitor technology and very low chloride ion permeability. Moisture sensitive coatings can be applied in 4 to 24 hours. Five Star Structural Concrete® V/O meets the performance requirements of EN 1504-3 (Class R4) and complies with UK Specification for Highway Works Volume 1.

ADVANTAGES

- Can be troweled vertically or overhead
- Contains migrating corrosion inhibitors.
- Very low chloride ion permeability
- High 3-hour strength gains
- Moisture sensitive coatings can be applied in 4 to 24 hours
- One product for thin and thick placement
- Excellent freeze-thaw resistance
- Outstanding corrosion resistance for protection and rehabilitation

USES

- Rapid repair of reinforced concrete structures, load bearing walls, soffits
- Rapid repairs during operational shutdowns
- Marine and hydraulic structure repairs

PACKAGING AND YIELD

Five Star Structural Concrete® V/O is packaged in 25 kg bags yielding approximately 12.9 L at maximum water.

SHELF LIFE

12 months in original unopened packaging when stored in dry conditions; high relative humidity will reduce shelf life.

TYPICAL PROPERTIES AT 20°C			
Property	Test Standard	Requirement per EN1504	FSP Result
Compressive Strength	EN 12190:1999		
	3 Hours	NR ¹	20 MPa
	1 Day	NR	25 MPa
	7 Days	NR	40 MPa
	28 Days	≥ 45 MPa	50 MPa
Chloride Ion Content	EN 1015-17:2000	≤ 0.05%	< 0.01%
Bond Strength	EN 1542:1999	≥ 2 MPa	≥ 2 MPa
Modulus of Elasticity	EN 13412:2006-11	≥ 20 GPa	26 GPa
Thermal Compatibility	EN 13687-1:2002	≥ 2 MPa	≥ 2 MPa
Carbonation Resistance	EN 13295: 2005	$d_k \leq$ concrete control (Class R4)	$d_k \leq$ concrete control
Fire Classification	EN 1504-3 Section 5.5	Declared	Euroclass A1
Working Time at 20°C May be affected by colder & warmer temperatures ²	EN 13395-1:2002	Declared per FPC ³	15 minutes

¹ NR = Not Required

² Refer to product Design-A-Spec™ Guidelines for Cold Weather and Hot Weather Repairs.

³ FPC = Factory Production Control

The data shown above reflects typical results based on laboratory testing under controlled conditions. Reasonable variations from the data shown above may result. Test methods are modified where applicable.

APPLICATION INFORMATION

Mixing Ratio 3.0 - 3.5 L potable water per 25 kg bag

Placement Depth 6 mm - 75 mm

PLACEMENT GUIDELINES

For optimum performance, install at temperatures between 2°C and 35°C. For hot or cold weather applications contact Five Star Products.

- SURFACE PREPARATION:** All horizontal and vertical concrete surfaces in contact with Five Star Structural Concrete® shall be free of oil, grease, laitance, and other contaminants. A saw cut perimeter edge at 6 mm is recommended. To maximize bond, horizontal and vertical concrete surfaces should be prepared by acceptable means to coarse aggregate exposure. Remove all oxidation from exposed reinforcing steel to achieve a clean steel finish. Presoak with potable water concrete surfaces for 8 hours, continuously and consistently, via wet rags, wet hessian, misting, hosing, or similar method to obtain a saturated surface dry condition (SSD) or use a suitable epoxy bonding adhesive. Featheredging is not allowed.
- MIXING:** Mix Five Star Structural Concrete® V/O thoroughly for approximately three to four minutes to a uniform consistency with a forced action mixer (stationary barrel with moving blades). A drill and paddle mixer is acceptable for single bag mixes. Mix Five Star Structural Concrete® V/O with 3.0 - 3.5 litres potable water per 25 kg unit. Working time is approximately 15 minutes at 20°C at maximum water. Follow printed instructions on the package. Start by adding the minimum amount of pre-measured water to mixer and, after mixing for three to four minutes, adjust consistency as required to achieve non-sag consistency. Never exceed the maximum water content stated on the package.
- PLACEMENT PROCEDURES:** Firmly work a small amount of Five Star Structural Concrete® V/O into concrete surface with a trowel, taking care not to leave air pockets. Application is from one side of the repair to the other, filling the repair to the desired level. For multiple lift applications, contact Five Star Products. Finish as necessary.
- POST-PLACEMENT PROCEDURES:** Keep material as cool as possible and protect from wind and sun exposure. Wet curing shall begin as soon as material reaches final set (surface changes from dark to light and/or surface is hard). Five Star Structural Concrete® V/O shall be kept continuously wet for at least 30 minutes after final set. At lower temperatures final set and strength development may take longer. Protect from freezing until a compressive strength of at least 7 MPa is reached. Refer to product Design-A-Spec™ Guidelines for additional post-placement procedures.

PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed information contact Five Star Products at +44 (0) 7469 746101.

HEALTH and SAFETY

Contains cementitious material. May cause an allergic reaction. Take appropriate measures to avoid breathing dust. Avoid contact with eyes and contact with skin. In case of contact with eyes, immediately flush with plenty of water for at least 15 minutes. Immediately call a physician. Wash skin thoroughly after handling. Keep product out of reach of children. **PRIOR TO USE, REFER TO SAFETY DATA SHEET.**

SKU/PRODUCT CODE	DESCRIPTION	# UNITS/PALLET	UNIT SIZE
29601	Five Star Structural Concrete® V/O	40	25 kg Bag

WARRANTY: "FIVE STAR PRODUCTS, INC. (FSP) PRODUCTS ARE MANUFACTURED TO BE FREE OF MANUFACTURING DEFECTS AND TO MEET FSP'S CURRENT PUBLISHED PHYSICAL PROPERTIES WHEN APPLIED IN ACCORDANCE WITH FSP'S DIRECTIONS AND TESTED IN ACCORDANCE WITH ASTM AND FSP STANDARDS. HOWEVER, SHOULD THERE BE DEFECTS OF MANUFACTURING OF ANY KIND, THE SOLE RIGHT OF THE USER WILL BE TO RETURN ALL MATERIALS ALLEGED TO BE DEFECTIVE, FREIGHT PREPAID TO FSP, FOR REPLACEMENT. THERE ARE NO OTHER WARRANTIES BY FSP OF ANY NATURE WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IN CONNECTION WITH THIS PRODUCT. FSP SHALL NOT BE LIABLE FOR DAMAGES OF ANY SORT, INCLUDING PUNITIVE, ACTUAL, REMOTE, OR CONSEQUENTIAL DAMAGES, RESULTING FROM ANY CLAIMS OF BREACH OF CONTRACT, BREACH OF ANY WARRANTY, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR FROM ANY OTHER CAUSE WHATSOEVER. FSP SHALL ALSO NOT BE RESPONSIBLE FOR USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT HELD BY OTHERS."

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Specifications Subject to Change.
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