



STRUCTURAL CONCRETE V/O

Vertical/Overhead Permanent Repair

PRODUCT DESCRIPTION

Five Star Structural Concrete® V/O is a high strength, rapid setting, one 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 has a very low chloride ion permeability. Moisture sensitive coatings can be applied in 8 to 24 hours.

ADVANTAGES

- Can be troweled vertically or overhead
- Very low chloride ion permeability
- High three hour strength gains
- Can be coated in 8 to 24 hours
- Cold weather installation
- One product for thin and thick placement
- Excellent freeze/thaw resistance

USES

- Rapid repair of load bearing walls, ceilings and other structural members
- Cold weather repairs
- Rapid repairs during shutdown
- Marine and hydraulic structure repairs

PACKAGING AND YIELD

Five Star Structural Concrete V/O is packaged in heavy-duty polyethylene lined bags or plastic pails and is available in 50 lb (22.7 kg) units yielding approximately 0.44 cubic feet (12.5 liters) at maximum water.

SHELF LIFE

One year (packaged in bags) or two years (packaged in pails) in original unopened packaging when stored in dry conditions; high relative humidity will reduce shelf life.

TYPICAL PROPERTIES AT 70°F (21°C)	
Compressive Strength, ASTM C 109	
3 Hours	2500 psi (17.2 MPa)
1 Day	3500 psi (24.2 MPa)
7 Days	4000 psi (27.6 MPa)
28 Days	5000 psi (34.5 MPa)
Bond Strength, ASTM C 882	
1 Days	1500 psi (10.4 MPa)
7 Days	2200 psi (15.2 MPa)
Length Change, ASTM C 157	
28 Days Wet	+0.04%
28 Days Dry	-0.05%
Thermal Coefficient of Expansion, ASTM C 531	5.0 x 10 ⁻⁶ in/in/°F (9.0 x 10 ⁻⁶ mm/mm/°C)
Chloride Ion Permeability, ASTM C 1202	
3 Days	Very Low (<1000 Coulombs)
28 Days	Very Low (<1000 Coulombs)
Working Time at 70°F (21°C)	15 minutes

**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.*

PLACEMENT GUIDELINES

1. **SURFACE PREPARATION:** All horizontal and vertical concrete surfaces in contact with Five Star Structural Concrete V/O shall be free of oil, grease, laitance, and other contaminants. All horizontal and vertical concrete surfaces must be clean, sound and rough to ensure a good bond. Remove all oxidation from exposed reinforcing steel and for additional protection coat reinforcing steel with Five Star® AC Coat. A perimeter edge and minimum depth of 1/4 inch (6 mm) should be provided for a durable repair. Featheredging is not desirable. Soak concrete surfaces prior to application with liberal quantities of potable water, leaving the concrete saturated and free of standing water. Surfaces shall be conditioned to between 35°F and 90°F (2°C and 32°C) at time of placement.
2. **MIXING:** Mix Five Star Structural Concrete V/O thoroughly for approximately three to four minutes to a uniform consistency with a mortar 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 to 4 quarts potable water per 50 lb. unit. Working time is approximately 15 minutes at 70°F (21°C). Follow printed instructions on the package.
3. **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's Engineering and Technical Service Center. Finish as necessary.
4. **POST-PLACEMENT PROCEDURES:** Five Star Structural Concrete V/O shall be kept wet for at least 30 minutes immediately after hardening. Protect from freezing until a compressive strength of at least 1000 psi (6.9 MPa) is reached.

NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed placement procedures, refer to Design-A-Spec™ installation guidelines or call the Five Star Products Engineering and Technical Service Center at (800) 243-2206.

CONSIDERATIONS

- Never exceed the maximum water content stated on the package.
- Temperature of materials, equipment and surfaces must be between 35°F and 90°F (2°C and 32°C) at time of placement. For cold and hot weather placement, consult Design-A-Spec™.
- Substrate shall be free of frost and ice.

CAUTION Contains cementitious material and crystalline silica. International Agency for Research on Cancer has determined that there is sufficient evidence for the carcinogenicity of inhaled crystalline silica to humans. 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 MATERIAL SAFETY DATA SHEET.**

For worldwide availability, additional product information and technical support, contact your local Five Star distributor, local sales representative, or you may call Five Star's Engineering and Technical Service Center at (800) 243-2206.

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."

Five Star Products, Inc.
Corporate Headquarters
750 Commerce Drive
Fairfield, CT 06825 USA
Tel: 203-336-7900 • Fax: 203-336-7930
<http://www.fivestarprouducts.com>



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