



# **STRUCTURAL CONCRETE® V/O**

Vertical/Overhead Permanent Repair  
For Nuclear Safety Zone Applications

## **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 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 8 to 24 hours. This specialized version of Five Star Structural Concrete® V/O is compliant with NRC 10CFR50 Appendix B and ASME NQA-1 Quality Programs.

## **ADVANTAGES**

- Can be troweled vertically or overhead
- Very low chloride ion permeability
- High 3-hour strength gains
- Can be coated in 8 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 load bearing walls, ceilings and other structural members
- 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	2,500 psi (17.2 MPa)
1 Day	3,500 psi (24.2 MPa)
7 Days	4,000 psi (27.6 MPa)
28 Days	5,000 psi (34.5 MPa)

#### **Bond Strength, ASTM C 882**

1 Days	1,500 psi (10.4 MPa)
7 Days	2,200 psi (15.2 MPa)

#### **Length Change, ASTM C 157**

28 Days Wet	+ 0.04%
28 Days Dry	- 0.13%

#### **Freeze/Thaw Resistance, ASTM C 666A**

Relative Durability Modulus	95%
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#### **Chloride Ion Permeability, ASTM C 1202**

28 Days	Very Low (<1,000 Coulombs)
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#### **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

- SURFACE PREPARATION:** All concrete surfaces in contact with Five Star Structural Concrete® V/O shall be free of oil, grease, laitance, and other contaminants. All concrete surfaces must be clean, sound and rough to ensure a good bond. Mechanically roughen concrete surfaces in accordance with ICRI Technical Guideline 03732 to a minimum concrete surface profile roughness (CSP) 6 or greater. Remove all oxidation from exposed reinforcing steel. 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 40°F and 90°F (5°C and 32°C) at time of placement.
- 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. 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.
- 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:** Five Star Structural Concrete® V/O shall be kept continuously wet for at least 30 minutes after final set. Protect from freezing until a compressive strength of at least 1,000 psi (6.9 MPa) is reached.

**NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY.** For more detailed placement procedures, refer to Five Star® Design-A-Spec™ installation guidelines or call Five Star Products at 1-800-243-2206.

## CONSIDERATIONS

- Never exceed the maximum water content stated on the package.
- Temperature of materials, equipment and surfaces must be between 40°F and 90°F (5°C and 32°C) at time of placement. For cold and hot weather placement, consult the Five Star® Design-A-Spec™ installation guidelines.
- Substrate shall be free of frost and ice.

## CAUTION

Contains cementitious material and crystalline silica. The 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 SAFETY DATA SHEET.**

For worldwide availability, additional product information and technical support, contact your local Five Star® distributor, local sales representative, or call Five Star Products at 1-800-243-2206.

SKU/PRODUCT CODE	DESCRIPTION	# UNITS/PALLET	UNIT SIZE
29600N	Five Star Structural Concrete® V/O for Nuclear Safety Zone	56	50 lb. (22.7 kg) Bag
29500N	Five Star Structural Concrete® V/O for Nuclear Safety Zone	36	50 lb. (22.7 kg) Pail

Compliant with NRC 10CFR50 Appendix B and ASME NQA-1 Quality Programs

**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."

Specifications Subject to Change.

For most current version of datasheet, go to [FiveStarProducts.com](http://FiveStarProducts.com)

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