



STRUCTURAL CONCRETE®

Fast, High Early Strength Permanent Repair
formerly Five Star Structural Concrete® 501

PRODUCT DESCRIPTION

Five Star Structural Concrete® is a high early strength, single component, permanent concrete repair material. Containing migrating corrosion inhibitors, Five Star Structural Concrete® produces a repair which is dimensionally stable, develops an integral bond to existing concrete, and restores structural integrity within hours of placement. Application thickness can range from 19 mm to 300 mm in a single pour. Five Star Structural Concrete® provides increased corrosion protection of 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® meets the performance requirements of EN 1504-3 (Class R4).

ADVANTAGES

- Single component for reliability and ease of use
- Very low chloride ion permeability
- Fast turnaround times with high 3-hour strengths
- High bond strength
- Moisture sensitive coatings can be applied in 4 to 24 hours
- Very low shrinkage
- Excellent freeze/thaw resistance
- Application thickness 19 mm - 160 mm (300 mm with aggregate extension)
- Outstanding corrosion resistance for protection and rehabilitation

USES

- Repair of concrete structures
- Rapid machinery foundation rebuilds
- Fast concrete repair for overcoating or re-grouting
- Concrete floor repairs and overlays
- Construction joint repair
- Marine and hydraulic structure repairs
- Repair of tanks, sumps and curbs

PACKAGING AND YIELD

Five Star Structural Concrete® is packaged in heavy-duty plastic bags and is available in 25 kg units yielding approximately 12.1 liters at maximum water, or 13.6 liters with a 30% extension using 9 - 10 mm pea gravel.

SHELF LIFE

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

TYPICAL PROPERTIES AT 25°C		
Compressive Strength, ASTM C109	Trowelable	Flowable
3 Hours	25 MPa	17 MPa
1 Day	40 MPa	34 MPa
7 Days	45 MPa	40 MPa
28 Days	60 MPa	55 MPa
Bond Strength, ASTM C882		
1 Day	14 MPa	14 MPa
7 Days	20 MPa	17 MPa
Length Change, ASTM C157, 28 days		
Dry Shrinkage	-0.08%	-0.09%
Wet Expansion	+0.04%	+0.05%
Freeze/Thaw Resistance, ASTM C666A		
Relative Durability Modulus	≥95%	≥95%
Chloride Ion Permeability, ASTM C1202		
28 Days	Very Low (<1,000 Coulombs)	Very Low (<1,000 Coulombs)
Working Time @ 25°C, ASTM C1437 modified May be affected by colder & warmer temperatures ¹	15 minutes	25 minutes

¹ Refer to Five Star® Technical Bulletins: *Concrete Repair Material Placement in Cold Weather*; *Concrete Repair Material Placement in Hot Weather*

APPLICATION INFORMATION

Mixing Ratio 2.25 - 2.9 L potable water per 25 kg bag

Placement Depth 19 mm - 160 mm
>160 mm, contact Five Star Products

PLACEMENT GUIDELINES

At time of placement, if temperatures of equipment and surfaces are not between 2°C and 35°C, contact Five Star Products for cold and hot weather procedures. For atmospheric temperature above 35°C, working and setting times will be reduced and material may dry prematurely without proper curing. Atmospheric temperatures below 20°C will slow setting time and strength development. Provide conditioning, either cooling or heating, plus curing as necessary in temperature extremes.

- 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 19 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 burlap, ponding, or similar method to obtain a saturated surface dry condition (SSD) or use a suitable epoxy bonding adhesive. Featheredging is not allowed. Refer to product Design-A-Spec™ Guidelines for surface preparation detail.
- FORMWORK:** Formwork should be constructed 24-hours prior to the installation. Formwork shall be constructed of rigid non-absorbent materials, securely anchored, liquid-tight and strong enough to resist forces developed during placement. Formwork and areas where bond is not desired must be treated with form oil, paste wax or similar material. Joints may be necessary depending on pour dimensions. Any existing joints within the repair area should be maintained. Contact Five Star Products for further information.
- MIXING: Mortar Mixer** (stationary barrel with moving blades)
Start with approximately 2.25 liters potable water per 25 kg bag in the mixer. Add Five Star Structural Concrete® and mix for approximately 2 – 3 minutes after the addition of the final bag to a uniform consistency. Add additional potable water as necessary to achieve desired flow mixing for an additional 1 – 2 minutes after final addition of potable water. Do not exceed the maximum recommended amount of potable mixing water as directed or add an amount that will cause segregation.
Single Bag Mixing Drill and Paddle
Start with about 2.25 liters in the mix vessel. Add approximately 75-80% of Five Star Structural Concrete® to the potable mix water and mix to uniform consistency only until product easily wets out and add remaining grout and continue to mix to uniform consistency. Add additional potable water as needed to achieve desired flow mixing for an additional 1 – 2 minutes after final addition of potable water. Do not exceed the maximum recommended amount of potable mixing water as directed or add an amount that will cause segregation.
For pours over 160 mm in depth contact Five Star Products for aggregate extension recommendations. For bulk mixing applications, contact Five Star Products.
- METHODS OF PLACEMENT:** Whenever possible, place Five Star Structural Concrete® full depth from one side of the repair to the other. To ensure optimal bond development, firmly work material into substrate. Placement should be continuous to prevent cold joints between pours.
- POST-PLACEMENT PROCEDURES:** Do not overwork Five Star Structural Concrete®. 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® shall be continuously wet cured for one to four hours depending on the volume and depth of the placement. At lower temperatures final set and strength development may take longer. Do not allow product to freeze until it reaches 7 MPa compressive strength. Refer to product Design-A-Spec™ Guidelines for additional post-placement procedures.
- CLEAN UP:** All tools and equipment may be cleaned with soap and water before the material hardens.

NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed information contact Five Star Products.

HEALTH AND SAFETY

Contains cementitious material. May produce 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, READ THE SAFETY DATA SHEET.**

SKU/PRODUCT CODE	DESCRIPTION	# UNITS/PALLET	UNIT SIZE
29120	Five Star Structural Concrete®	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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