



# FIVE STAR® SHOTCRETE

Pneumatically Applied Concrete Repair

## PRODUCT DESCRIPTION

Five Star Shotcrete is a dry process, shotcrete applied, high strength, one component, enhanced hydraulic cement repair material. Five Star Shotcrete may be used from 1/4 inch (6 mm) to full depth applications with a long finishing time.

## ADVANTAGES

- High strengths
- One component/ease of use
- Pneumatically applied
- Low rebound
- Versatile 1/4 inch (6 mm) to large volume
- Resistant to salts
- Excellent freeze/thaw resistance

## USES

- Vertical and overhead repair
- Repair of load bearing walls, ceilings and other structural members
- Structural repair of industrial plants, parking structures, tunnels and bridges
- Marine and hydraulic structure repair

## TECHNICAL SUPPORT

Five Star Products maintains the industry's foremost Engineering and Technical Support Group:

- Over 30 years of experience in concrete repair
- Technical Center staffed with experienced engineers available for consultation
- Design-A-Spec™ for engineering specification assistance
- Experienced representatives for field service
- Corporate research laboratory available to customize products for unique applications

## PACKAGING AND YIELD

Five Star Shotcrete is packaged in heavy-duty polyethylene lined bags each weighing 50 lb (22.7 kg) yielding approximately 0.39 cubic feet (11.0 liters). Also available in 100 lb (45.4 kg) bags and 3000 lb (1360 kg) bulk sacks.

## SHELF LIFE

One year in original unopened packaging when stored in dry conditions. Higher humidity will reduce shelf life.

## TYPICAL PROPERTIES AT 73°F (23°C)

Compressive Strength, ASTM C 109	
1 Day	3000 psi (20.7 MPa)
28 Days	7500 psi (51.8 MPa)
Compressive Strength, ASTM C 42	
in accordance with ACI 506R-90	
3 Days	5500 psi (38.0 MPa)
7 Days	7000 psi (48.3 MPa)
28 Days	8000 psi (55.2 MPa)
Bond Strength, ASTM C 882	
7 Days	2000 psi (13.8 MPa)
Freeze/Thaw Resistance, ASTM C 666A	
Relative Durability Factor	90%
Chloride Ion Permeability, ASTM C 1202	
28 Days	Very Low (< 1000 coulombs)
Thermal Coefficient of Expansion, ASTM C 531	5.0 x 10 <sup>-6</sup> in/in/°F (9.0 x 10 <sup>-6</sup> mm/mm/°C)

*The data shown above reflect 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 surfaces in contact with Five Star Shotcrete shall be free of oil, grease, laitance, and other contaminants. Concrete 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 45°F and 90°F (7°C and 32°C) at the time of placement.
2. **MIXING:** The mixing equipment should be capable of maintaining placement continuously.  
**DRY MIX PROCESS:** Predampen Five Star Shotcrete in a mortar mixer prior to placement into gun or with a prehydration water ring equipped with a screen to avoid plug-ups. Avoid over dampening material. Do not predampen more material than can be placed within 60 minutes. Adjust consistency at nozzle.
3. **PLACEMENT PROCEDURES:** Apply Five Star Shotcrete to full design thickness whenever possible. Overhead placement is applied in layers just thick enough to prevent sagging. Direct nozzle perpendicular to surface and rotate in a series of circular patterns, filling inside corners first. Five Star Shotcrete should emerge from the nozzle in a uniform, uninterrupted flow. Finish to desired texture with screed, float, trowel, or brush. For more detailed application and curing procedures, refer to ACI 506R-90, Guide to Shotcrete Report.
4. **POST-PLACEMENT PROCEDURES:** Five Star Shotcrete shall be protected until initial set, then immediately coat with an approved curing compound meeting water retention properties of ASTM C 309 or wet cure for a minimum of three days. In-service operation may begin immediately after the required strength has been reached.  
**NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY.** For more detailed placement procedures, refer to DESIGN-A-SPEC™, or call the Five Star Products Engineering and Technical Center at 800-243-2206.

## LIMITATIONS

- Never exceed the maximum water content stated on the package.
- Temperature of surfaces must be between 45°F and 90°F (7°C and 32°C) at time of placement.
- Repair material shall be protected from freezing until it reaches 1000 psi (6.9 MPa).
- Placement shall be continuous to avoid cold joints.

## CAUTION

Contains cementitious material and crystalline silica. International Agency for Research on Cancer has evaluated 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.

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, EXPRESSED 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."

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 Center at 800-243-2206.

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