



# STRUCTURAL CONCRETE GUNITE WP/FS

High Strength Gunite Repair

## PRODUCT DESCRIPTION

Five Star Structural Concrete Gunite WP/FS is a wet process, shotcrete applied, permanent concrete repair material. This product is a high strength, one component, enhanced hydraulic cement repair material. Five Star Structural Concrete Gunite WP/FS may be used from 1/4 inch (6 mm) to full depth applications and provides a long finishing time.

## ADVANTAGES

- Large volume applications
- Long finishing time
- Pneumatically applied
- Low rebound
- Versatile 1/4 inch (6 mm) to full depth applications
- Very low chloride ion permeability
- Excellent freeze/thaw resistance

## USES

- Vertical and overhead repairs
- Repair of load bearing walls, ceilings and other structural members
- Structural repair for industrial plants
- Marine and hydraulic structure repair

## PACKAGING AND YIELD

Five Star Structural Concrete Gunite WP/FS is packaged in heavy-duty polyethylene lined bags and is available in 50 lb (22.7 kg) units yielding approximately 0.39 cubic feet (11.0 liters) at maximum water.

## SHELF LIFE

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

TYPICAL PROPERTIES AT 70°F (21°C)	
<b>Compressive Strength, ASTM C 109</b>	
1 Day	3500 psi (24.2 MPa)
28 Days	8000 psi (55.2 MPa)
<b>Compressive Strength, ASTM C 42 in accordance with ACI 506R-90</b>	
3 Days	6000 psi (41.4 MPa)
7 Days	7500 psi (51.8 MPa)
28 Days	8500 psi (58.7 MPa)
<b>Bond Strength, ASTM C 882</b>	
7 Days	2000 psi (13.8 MPa)
<b>Thermal Coefficient of Expansion, ASTM C 531</b>	
	$5.0 \times 10^{-6}$ in/in/°F ( $9.0 \times 10^{-6}$ mm/mm/°C)
<b>Chloride Ion Permeability, ASTM C 1202</b>	
28 Days	Low
<b>Working Time at 70°F (21°C)</b>	
	30 minutes

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

## PLACEMENT GUIDELINES

- 1. SURFACE PREPARATION:** All surfaces in contact with Five Star Structural Concrete® Gunitite WP/FS shall be free of oil, grease, laitance, and other contaminants. Concrete must be clean, sound and rough to ensure a good bond. 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:** Wet down mortar mixer (stationary barrel with moving blades) before using and drain any excess water. A drill and paddle mixer is acceptable for single bag mixes. Add the minimum amount of premeasured potable water as stated on product packaging to mixer. While mixing, slowly add Five Star Structural Concrete Gunitite WP/FS and mix to a uniform consistency for three to four minutes. To achieve desired consistency for wet process application, add remaining water as necessary. Do not exceed maximum water content as stated on product packaging or add an amount that will cause segregation. Mix thoroughly for approximately five minutes. Do not mix more material than can be placed within 30 minutes. Do not retemper the mix by adding additional water.
- 3. METHODS OF PLACEMENT:** Apply Five Star Structural Concrete Gunitite WP/FS to full design thickness whenever possible. Repair material 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 Structural Concrete Gunitite WP/FS should emerge from the nozzle in a uniform, uninterrupted flow. Finish to desired texture with screed, float, trowel, or brush. To obtain optimum results, repair shall be installed to full depth without allowing intermediate lifts to harden. Where placement depth and patch geometry require installation in lifts, subsequent lifts may be placed after repair material has reached initial set. Applied material shall be given a raked finish to ensure proper adhesion between lifts. Repair material must be kept continuously wet from time of hardening until installation of succeeding lifts. For more detailed application and curing procedures, refer to ACI 506R-90, Guide to Shotcrete Report.  
**SPECIAL CONDITIONS:** For use in cold temperatures, Five Star Structural Concrete Gunitite WP/FS must be maintained at a temperature of at least 45°F (7°C). Protect from freezing until a compressive strength of at least 1000 psi (6.9 MPa) is obtained. Faster strength gain will occur when the Five Star Structural Concrete Gunitite WP/FS and mixing water have been conditioned to a higher temperature prior to placement. In high temperatures, Five Star Structural Concrete Gunitite WP/FS should be kept as cool as possible, but not exceeding 90°F (32°C). Ice cold water should be used for mixing to help maintain sufficient working time.
- 4. POST-PLACEMENT PROCEDURES:** Five Star Structural Concrete Gunitite WP/FS shall be coated with an approved curing compound meeting the water retention properties of ASTM C 309 immediately after finishing. Protect from excessive evaporation prior to set.

**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 Engineering and Technical Center at (800) 243-2206.

## CONSIDERATIONS

- Never exceed the maximum water content as stated on the package or mix to a consistency which will cause segregation.
- Temperature of surfaces must be between 45°F and 90°F (7°C and 32°C) at time of placement. For cold and hot weather placement, call the Five Star Products Engineering and Technical Service Center at (800) 243-2206.
- 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 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 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."

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