



FIVE STAR® FAST SET CEMENT

Field Mix Concrete

PRODUCT DESCRIPTION

Five Star Fast Set Cement is a fast setting, specially formulated hydraulic cement used to produce fast setting concrete or mortar for horizontal repairs in traffic areas. Concrete or mortar made with Five Star Fast Set Cement produces high early strengths as well as ease of workability required by the transportation industry. Five Star Fast Set Cement is field mixed into a mortar or concrete, ideal for use in a volumetric mixer.

ADVANTAGES

- Ability to customize field mix
- High early strength
- Open to traffic in two hours
- Freeze/thaw resistance
- Adjustable working time

USES

- Airport runways and taxiways
- Highways and bridges
- Parking decks and ramps
- General repair of concrete structures
- Expansion joint rebuilds
- Steps and sidewalks

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

Five Star Fast Set Cement is available in heavy-duty polyethylene lined bags weighing 94 lb (42.6 kg) or bulk bags weighing 2500 lb (1136 kg).

TRIAL MIX DESIGN

	<u>Mix Design</u> ⁽¹⁾	
	One Bag	One Cubic Yard
	<u>lb</u>	<u>lb</u>
Fast Set Cement	94	728
Concrete Sand ⁽²⁾	178.3	1382
3/8" Pea Gravel ⁽²⁾	218	1689
Water ⁽³⁾	28.2 to 32.9	218.4 to 254.8
Admixtures ⁽⁴⁾		
Slump	3 to 6 inches (75 mm to 150 mm)	

(1) These are suggested SSD starting weights. Final quantities shall be based on fine and coarse aggregate which is available at the job site.

(2) Aggregate must meet the requirements of ASTM C 33.

(3) Net potable water added should be adjusted to control slump to within 3 to 6 inches (75 to 150 mm). Do not exceed a maximum water:cement ratio of 0.45.

(4) Air entraining and retarding admixture may be added for specific job requirements and weather conditions. Trial mixes should be performed to finalize dosage and mix design.

TYPICAL PROPERTIES AT 73°F (23°C) OF TRIAL MIX DESIGN

Compressive Strength, ASTM C 39	
2 Hours	2000 psi (13.8 MPa)
1 Day	3500 psi (24.2 MPa)
28 Days	6000 psi (41.4 MPa)
Length Change, ASTM C 157	
28 Days Wet	+0.03%
28 Days Dry	- 0.03%
Time of Set, ASTM C 266	
Initial Set	15-25 minutes
Final Set	20-30 minutes
Freeze/Thaw Resistance, ASTM C 666A	
Relative Durability Factor	> 90%
Flexural Strength, ASTM C 78	
3 Hours	350 psi

The data shown above reflect typical results based on laboratory testing under controlled conditions using selected aggregates. Variations from the data shown above may result based on aggregates used. Test methods are modified where applicable.



PLACEMENT GUIDELINES

1. **SURFACE PREPARATION:** All surfaces in contact with fast setting concrete 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 one inch (25 mm) for mortar or two inches (50 mm) for concrete should be provided for a durable repair. Featheredging is not recommended. Soak concrete surfaces prior to application with liberal quantities of potable water, leaving the concrete saturated and free of standing water or use Five Star® Bonding Adhesive. Surfaces shall be conditioned to between 40°F and 90°F (4°C to 32°C) at the time of placement.
2. **MIXING:** Small batches of concrete or mortar using Five Star Fast Set Cement may be mixed in a mortar mixer. Pre-wet the mortar mixer with potable water and empty excess water. Add 28 lb water per 94 lb bag of cement into the mixer. With the mixer turning, slowly add dry ingredients (cement and fine aggregate, then coarse aggregate) called for by the final mix design, and mix to a uniform consistency. Add only as much water as is needed to adjust the consistency to a slump of 3 to 6 inches. Do not exceed a water:cement ratio of 0.45. Do not mix more material than can be placed 10 minutes.
For large quantities, use a volumetric mixer. Adjust the mixer to deliver and mix ingredients in the proportions called for by the final mix design. Adjust the water to give a slump of 3 to 6 inches. Do not exceed a water:cement ratio of 0.45.
3. **PLACEMENT PROCEDURES:** Firmly work Five Star Fast Set Cement concrete or mortar into substrate and place full depth from one side of the repair to the other. Where this is not practical, placement must be continuous to prevent cold joints between pours. Finish as necessary.
SPECIAL CONDITIONS: For use in cold temperatures, fast setting concrete must be maintained at a temperature of at least 35°F (2°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 mix temperature of the fast setting concrete has been conditioned to 60°F to 70°F (15°C to 21°C) prior to placement.
In hot temperatures, fast setting concrete should be kept as cool as possible, but not exceeding 80°F (26°C) unless a retarder is used. Chilled water should be used for mixing to help maintain sufficient working time.
4. **POST-PLACEMENT PROCEDURES:** Five Star Fast Set Cement concrete or mortar shall be protected from excessive evaporation 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:cement ratio of 0.45.
- Temperature of surfaces must be between 40°F and 90°F (4°C and 32°C) at time of placement.
- Substrate shall be free of frost and ice.
- Repair material shall be protected from freezing until it reaches 1000 psi (6.9 MPa).
- Placement shall be continuous to prevent cold joints.

CAUTION

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