

FIVE STAR STRUCTURAL CONCRETE HTR

HIGH EARLY STRENGTH REPAIR FOR HIGH TEMPERATURE EXPOSURE

PRODUCT DESCRIPTION

Five Star Structural Concrete HTR is a unique high temperature resistant concrete repair material which can be pumped or poured into place. Five Star Structural Concrete HTR gains strength rapidly and can be exposed to 538°C in six hours and up to 1316°C after a 7 day curing procedure.

ADVANTAGES

- Thermal shock resistant
- High temperature resistance
- Coarse aggregate extension up to 100%
- Resistant to sulfates
- High early strengths
- Excellent freeze / thaw resistance

USES

- Areas of high temperature exposure
- Thermal cycling up to 1290°C
- Rapid repairs during shutdowns
- Coker, kiln and foundry repairs

PACKAGING AND YIELD

Five Star Structural Concrete HTR is packaged in heavy-duty polyurethane lined bags and is available in 25kg units, yielding approximately 13 litres 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 21°C

Compressive Strength, ASTM C109

6 Hours	2500 psi (17,3 MPa)
1 Day	4500 psi (31,1 MPa)
7 Days	5500 psi (38,0 MPa)
28 Days	7000 psi (48,3 MPa)

Bond Strength, ASTM C882

1 Day	1500 psi (10,4 MPa)
7 Days	2500 psi (17,3 MPa)

Thermal Coefficient of Expansion, ASTM C531

$5,0 \times 10^{-6}$ in/in/°F ($9,0 \times 10^{-6}$ mm/mm/°C)

Working Time at 21°C 30 Minutes

APPLICATION INSTRUCTIONS

These instructions are not intended to show product recommendations for specific service. They are issued as an aid in determining correct surface preparation, mixing instructions and application procedure. It is assumed that the proper product recommendations have been made. These instructions should be followed closely to obtain the maximum service from the materials.

PLACEMENT GUIDELINES

- 1. SURFACE PREPARATION:** All horizontal and vertical surfaces in contact with Five Star Structural Concrete HTR shall be free of oil, grease, laitance and other contaminants. All horizontal and vertical concrete surfaces 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 50mm should be provided for a durable repair. Feather edging 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 4°C and 32°C at time of placement.
- 2. FORMWORK:** Formwork shall be constructed of rigid non-absorbent materials, securely anchored, liquid-tight and strong enough to resist forces developed during placement. 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 the Five Star Engineering and Technical Service Centre for further information.
- 3. MIXING:** Mix Five Star Structural Concrete HTR thoroughly for 4 to 5 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. For optimum performance, condition between 16°C and 27°C. Mix Five Star Structural Concrete HTR with 1,9 litres to 2,5 litres of potable water per 25kg unit. Adjust consistency if necessary, but do not exceed maximum water content stated on the package or an amount that will cause segregation. Addition of coarse aggregate, meeting ASTM C33, should be used for large volume pours. Working time is approximately 30 minutes at 21°C. Follow printed instructions on the package. Always add mixing water first to mixer, followed by repair material.
- 4. PLACEMENT PROCEDURES:** Whenever possible, place Five Star Structural Concrete HTR 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. For pours over 50mm in depth and detailed information regarding pumping, contact the Five Star Engineering and StonCor Africa. Finish as necessary.
- 5. POST-PLACEMENT PROCEDURES:** Five Star Structural Concrete HTR shall be kept wet for a minimum of one to four hours. Immediately after hardening depending on the volume and depth of the placement. Wet curing shall begin as soon as the material is thumb-print hard. Approximately six hours after placement, material can be brought up to an operating temperature of 538°C. For operating temperatures up to 1290°C, wet cure for 3 days followed by dry cure for 4 days. Then slowly apply heat up to 1290°C.

NOTE: PRIOR TO APPLICATION, READ ALL PRODUCT PACKAGING THOROUGHLY. For more detailed placement procedures, refer to Design-A-Spec installation guidelines or call StonCor Africa (011 254 5500).

CONSIDERATIONS:

- Never exceed the maximum water content as stated on the package or add an amount that will cause segregation.
- If temperatures of equipment and surfaces are not between 4°C and 32°C at time of placement, refer to Design-A-Spec or call StonCor Africa (011 254 5500).
- For placement thinner than 50mm or greater than 102mm, and a volume exceeding 56,6 litres, call StonCor Africa (011 254 5500).

CAUTION:

Contains cementitious materials 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 THE 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 StonCor Africa (011 254 5500).

CAUTION: MAY CONTAIN FLAMMABLE SOLVENTS. KEEP AWAY FROM SPARKS AND OPEN FLAMES. IN CONFINED AREAS WORKMEN MUST WEAR FRESH AIRLINE RESPIRATORS. HYPERSENSITIVE PERSONS SHOULD WEAR GLOVES OR USE PROTECTIVE CREAM. ALL ELECTRONIC EQUIPMENT AND INSTALLATIONS SHOULD BE MADE AND GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. IN AREAS WHERE EXPLOSION HAZARDS EXIST, WORKMEN SHOULD BE REQUIRED TO USE NONFERROUS TOOLS AND TO WEAR CONDUCTIVE AND NONSPARKING SHOES.



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