Five Star Grout SP

High flow, high strength, shrinkage compensated, cementitious precision grout.

- High initial and long term strength development
- Can be pumped, poured or trowelled
- Ideal for use under machinery, grouting rails and bridge bearings

About this product
Five Star Grout SP is premixed cementitious grout similar to standard Five Star Grout, developed for applications where an economical grout with good flow and retention of flow and higher strengths is required.

Five Star Grout SP is based on specially selected Portland cements, graded aggregates and admixtures including a special form of carbon.

Five Star Grout SP is designed primarily as a flowing grout but can also be used at a trowellable consistency.

Complies with BS EN 1504-3 and -6.

Features and benefits
- Complies with HA Specification Clause 2601.4 at 5°C and 20°C
- Precision grout suitable for use over a range of temperatures and site conditions
- Can be pumped, poured or trowelled
- Thermal expansion similar to that of good quality concrete
- Excellent flow properties
- Can be applied in thicknesses from 10mm to 100mm
- Does not significantly lose workability during pot life
- High initial and long term strength development

Uses
- Under machinery and stanchion plates
- Grouting rails and bridge bearings
- Fixing bolts
- Underpinning
- Void filling

Constraints
Five Star grout SP must only be used in confined situations, e.g. under baseplates, in holes etc.

Technical Data EN1504

<table>
<thead>
<tr>
<th>Performance Characteristic</th>
<th>Method</th>
<th>Requirement</th>
<th>Result</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength</td>
<td>EN 12190</td>
<td>≥45 MPa</td>
<td>57.0</td>
<td>Pass</td>
</tr>
<tr>
<td>Chloride ion content</td>
<td>EN 1015-17</td>
<td>≤0.05 %</td>
<td>0.02</td>
<td>Pass</td>
</tr>
<tr>
<td>Adhesive bond</td>
<td>EN 1542</td>
<td>≥2.0 MPa</td>
<td>2.0</td>
<td>Pass</td>
</tr>
<tr>
<td>Carbonation resistance</td>
<td>EN 13295</td>
<td>0k ≤ control concrete (1,3)</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>Elastic modulus</td>
<td>EN 13412</td>
<td>≥20 GPa</td>
<td>221</td>
<td>Pass</td>
</tr>
<tr>
<td>Thermal compatibility Part I Freeze-thaw</td>
<td>EN 13687-1</td>
<td>Bond strength after 50 cycles ≥20 MPa</td>
<td>2.0</td>
<td>Pass</td>
</tr>
<tr>
<td>Capillary absorption</td>
<td>EN 13057</td>
<td>≤0.5 kgm-2h-0.5</td>
<td>0.25</td>
<td>Fail</td>
</tr>
<tr>
<td>Testing of Anchoring Products by the Pull-Out Method</td>
<td>BS EN 1881: 2006</td>
<td>Displacement ≤ 0.6 mm at 75 kN</td>
<td>0.4</td>
<td>Pass</td>
</tr>
</tbody>
</table>
Five Star Grout SP

Technical Data continued...

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Flow cone at 5°C and at 20°C</td>
<td>DTP Specification c2600, Clause 26014 ASTM C939-02</td>
<td>Efflux time of repeat to be within ≤5% of each other &amp; record average recorded</td>
<td>5°C - 37 seconds 20°C - 32.5 seconds</td>
<td>Satisfied</td>
</tr>
<tr>
<td>Flow between glass plates at 5°C and at 20°C</td>
<td>DTP Specification c2600, Clause 26014 C&amp;D drawing 0k2</td>
<td>Mortar should rise ≥10mm above the underside of the top plate at all positions, without signs of segregation, bleeding, effervescence or air inclusions</td>
<td></td>
<td>Satisfactory</td>
</tr>
<tr>
<td>28 Day compressive strength at 20°C</td>
<td>DTP Specification c2600, Clause 26014 EN 1290</td>
<td>≥500 N/mm²</td>
<td>65.5 N/mm²</td>
<td>Satisfied</td>
</tr>
<tr>
<td>Expansion test</td>
<td>DTP Specification c2600, Clause 26014 ASTM CB27-01a</td>
<td>≤0.25 ≤2.5%</td>
<td>2.18%</td>
<td>Satisfied</td>
</tr>
<tr>
<td>Elastic Stability</td>
<td>DTP Specification c2600, Clause 26014 BS 639 Part 1</td>
<td>≤1%</td>
<td>0.93%</td>
<td>Satisfied</td>
</tr>
</tbody>
</table>

Preparation
All surfaces should be clean and sound. Concrete surfaces must be free from any contamination including oil, grease, balast and dust – and for maximum bond, the surface should be roughened and presoaked with clean water. Immediately prior to grouting, remove free water including that in bolt holes or recesses. Metal surfaces must be free from rust, scale, oil or grease but removable metal shims should be lightly oiled. Ensure that bolt holes are free of dust, water or any loose material. Formwork should be well sealed to prevent leakage.

Mixing
This grout needs only to be mixed with sufficient water to give the consistency required. Mixing should be carried out in a proprietary grout mixer or in a bucket (where the height is at least 1/3 times its diameter) by using a medium-speed drill (650 rpm) with an MR4-type helical attachment. When using the maximum water to obtain a pourable grout, the following procedure is recommended. Pour about 2 litres of water into a suitable bucket, then add half the powder and mix to a thick paste consistency, ensuring any lumps are broken down by the shearing action. Continue mixing, adding more powder and some more water gradually into the vortex. After adding all the powder and having produced a mix of uniform creamy consistency, add the rest of the water slowly into the vortex to obtain the pourable grout. Do not mix the grout for more than 5 minutes. Avoid entraining excessive quantities of air during mixing by keeping the mixing head below the grout level at all times. To obtain the consistency required, add water as follows:

- Trowelable mix: Approx. 2.8 litres of water per 25kg bag
- Pourable mix: 46 to 4.8 litres of water per 25kg bag
- Pumpable mix: 40 to 46 litres of water per 25kg bag

Application
When pouring, the area to be grouted should be shuttered and a header box used to maintain a grout head of 150 – 200mm during the pour. Machine mixing is recommended to achieve continuous pouring. For large applications Five Star Grout SP should be placed by pump and it has been formulated to give a 45 minute working time, considered essential for pumping. It does not contain metal particles, wear and tear on equipment is similar to conventional sand/cement mixes. Mixing and placement can be carried out between +5°C and +40°C in service. Five Star Grout SP will perform similarly to other cementitious mixes based on Portland cement in the temperature range of –20°C to +150°C. Continuous grout flow is essential and sufficient grout and water should be available to be mixed to ensure there is no discontinuity of the flow. The diagram illustrates typical methods of placing Five Star Grout SP.

Packaging and yield
Five Star Grout SP is supplied in 25kg polythene lined bags.

Coverage
For a pourable mix each 25kg bag produces approximately 440 litres of grout i.e. 71 bags per cubic metre. When using the flowtable mix, the yield is 130 litres i.e. 77 bags per cubic metre.

Storage and shelf life
When stored unopened in a dry place at temperatures above 5°C, shelf life is 12 months from date of manufacture.

Health and safety
Contains cement (contains chromium (VI). May produce an allergic reaction) harmful by inhalation. Irritating to eyes and skin. Keep out of the reach of children. In case of contact with eyes, rinse immediately with plenty of water and seek medical help. After contact with skin, wash immediately with plenty of soap and water. Wear suitable protective clothing, gloves and eye/face protection.

For further information, please request the Material Safety Data Sheet for this product.

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