Coating Description
SHS 8000 TWAS is a glass forming iron based alloy that forms a nanocomposite comprised of a mixed amorphous and nanoscale microstructure when sprayed as a coating. SHS 8000 features high wear resistance, elevated temperature erosion resistance and a unique high hardness/toughness combination.

Key Performance Characteristics
- Excels in elevated temperature environments where fly ash and bed ash erosion occurs
- Superior bond strength without necessity of bond coat
- Hardness increases as a function of time and temperature

SHS 8000 coatings exhibit excellent combinations of corrosion and wear resistance, superior bond strength and high impact resistance. Superior bond strength values signify that this material has exceptional adhesion and cohesion. This also highlights the material’s extremely low residual stress (even at high thicknesses) inherent in this coating type. The probability of “pull-out” of individual particles during wear, erosion and other service conditions is extremely low. Low coating permeability results in a highly corrosion resistant barrier. Low oxide content contributes to high bond strength due to the very limited presence of internal voids and other defects. These characteristics provide predictable coating performance across a broad variety of service environments. SHS 8000 is especially resistant to elevated temperature oxidation, erosion and corrosion for protecting boiler tubes in coal fired boilers.

Industrial Uses
Power Generation

Power Industry Application
SHS 8000 coatings can increase boiler tube service lifetime

Elevated Temperature Erosion Resistance
SHS 8000 combines erosion and corrosion resistance with high hardness in elevated temperature environments where fly ash and bed ash erosion occurs. Based on results from aggressive accelerated elevated temperature erosion tests with highly erosive fly ash from a coal fired boiler at 30° and 90° impact angles, SHS 8000 coatings can provide increased lifetime over carbon steel substrate and leading industry standard protective coatings.

Continued on the other side.
Impact Resistance
Impact testing on SHS 8000 coatings was performed using a Gardner Impact testing machine with a 12 lb test weight and 0.5 in diameter impact punch dropped from 40 in height. As-sprayed and heat-treated (one hour soak at 600º C, water quenched) coatings of 0.020 in thickness were tested. The as-sprayed and heat-treated coatings survived 480 in-lbs impact and demonstrated the ability to deform with the substrate without chipping, cracking or delaminating.

Universal Applicability
When SHS 8000 is sprayed directly onto substrate alloys using conventional twin wire thermal spray equipment and standard substrate preparation practices, and without a bond coat, extremely high bond strength is achieved. In ASTM C633-01 Adhesion/Cohesion Bond Strength Tests, extremely high bond strength is achieved for SHS 8000 coatings on plain carbon steel, far exceeding bond strength of conventional coating materials.

Impact Resistance
<table>
<thead>
<tr>
<th>Temperature</th>
<th>Slope (W/mK)</th>
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</thead>
<tbody>
<tr>
<td>23º C</td>
<td>4.260</td>
</tr>
<tr>
<td>50º C</td>
<td>4.678</td>
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<tr>
<td>125º C</td>
<td>5.505</td>
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<tr>
<td>150º C</td>
<td>5.707</td>
</tr>
</tbody>
</table>

Available Wire
SHS8000W16
1/16 in (1.6 mm) cored wire

Packaging
25 lb wire spools and in bulk

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