Data Sheet

SSN Sintered Silicon Nitride (Mac-SSNS)

Description
An advanced synthetic ceramic with a nominal Si$_3$N$_4$ content of 99%. The sintered silicon nitride (SSN) technique produces a material with excellent physical properties that is ideally suited to components that operate under thermally demanding conditions.

Prime Features:
- Outstanding resistance to thermal downshock
- Extremely hard and wear resistant
- Exceptional compressive strength
- Excellent resistance to attack from molten non-ferrous alloys containing aluminium, magnesium, copper, zinc and lead
- Spatter resistant
- Low thermal conductivity
- High electrical resistivity

Typical Applications:
- Shrouds for TIG/MIG welding torches
- Shrouds for plasma cutting torches
- Heat treatment jigs and fixtures
- Bearing balls and rollers

Production Capabilities:
- Manufacture to close engineering tolerances
- Prototype, batch and volume production

Specifications
- Quality Assurance to ISO 9002

Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Colour</th>
<th>Gray</th>
<th>Black (reduced form)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk Density (fired)</td>
<td></td>
<td>3.2 Mg/m$^3$</td>
<td></td>
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<tr>
<td>Porosity (apparent)</td>
<td></td>
<td>0 (fully dense) % nominal</td>
<td></td>
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<tr>
<td>Vickers Hardness @Hv 0.5kg</td>
<td></td>
<td>16 GPa</td>
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<tr>
<td>Compressive Strength</td>
<td></td>
<td>&gt;3000 MPa</td>
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<tr>
<td>Flexural Strength (3-point)</td>
<td></td>
<td>650 MPa @20C</td>
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<tr>
<td>Young's modulus</td>
<td></td>
<td>280 Gpa @20C</td>
<td></td>
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<tr>
<td>Thermal Conductivity @20C</td>
<td></td>
<td>5.0 W/m.K</td>
<td></td>
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<tr>
<td>Thermal Expansion Coefficient $10^{-6}$/C (20-1000C)</td>
<td></td>
<td>8.8</td>
<td></td>
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<tr>
<td>Volume resistivity @20C</td>
<td></td>
<td>&gt;10$^{12}$ (pure form)</td>
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</tbody>
</table>

Morgan Advanced Materials is a global materials engineering company which designs and manufactures a wide range of high specification products with extraordinary properties, across multiple sectors and geographies. From an extensive range of advanced materials we produce components, assemblies and systems that deliver significantly enhanced performance for our customers' products and processes. Our engineered solutions are produced to high tolerances and many are designed for use in extreme environments.

We design and manufacture products for demanding applications in a variety of markets using a comprehensive range of advanced ceramic, glass, precious metal, piezoelectric and dielectric materials. We utilise core competences of applications engineering and superior materials technology, together with state of the art fully integrated manufacturing processes to offer precision ceramic components, ceramic-to-metal assemblies and special coatings for use in a variety of applications.

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