INCONEL 718 is a heat and corrosion resistant nickel alloy. Parts built from INCONEL 718 have chemical composition corresponding to UNS N07718, AMS 5662, AMS 5664, W.Nr 2.4668, DIN NiCr19Fe19NbMo3. This kind of precipitationhardening nickel-chromium alloy is characterized by having good tensile, fatigue, creep and rupture strength at temperatures up to 980 °C (1290 °F).

This material is ideal for many high temperature applications such as gas turbine parts, instrumentation parts, power and process industry parts etc. It also has excellent potential for cryogenic applications. Parts built from INCONEL 718 can be easily post-hardened by precipitation-hardening heat treatments. In both as-built and age-hardened states the parts can be machined, sparkeroded, welded, micro shot-peened, polished and coated if required.

### Mechanical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>As Built</th>
<th>Heat Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength</td>
<td>ISO 6892-1:2009(B) Annex D</td>
<td>980 ± 50 MPa</td>
<td>Min. 1250 MPa</td>
</tr>
<tr>
<td>Yield Strength (Rp 0.2 %)</td>
<td>ISO 6892-1:2009(B) Annex D</td>
<td>700 ± 50 MPa</td>
<td>Min. 1050 MPa</td>
</tr>
<tr>
<td>Elongation at Break</td>
<td>ISO 6892-1:2009(B) Annex D</td>
<td>28 ± 3 %</td>
<td>Min. 10 %</td>
</tr>
<tr>
<td>Young’s Modulus</td>
<td>-</td>
<td>160 ± 20 GPa</td>
<td>170 ± 20 GPa</td>
</tr>
<tr>
<td>Hardness</td>
<td>DIN EN ISO 6508-1</td>
<td>Approx. 30 HRC</td>
<td>Approx. 45 HRC</td>
</tr>
</tbody>
</table>

### Thermal Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>As Built</th>
<th>Heat Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Temp.</td>
<td>ASTM E1461-13</td>
<td>Approx. 650°C</td>
<td></td>
</tr>
<tr>
<td>Oxidation Resistance to</td>
<td>ASTM E1461-13</td>
<td>Approx. 980°C</td>
<td></td>
</tr>
</tbody>
</table>

### Heat Treatment

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT - 980°C</td>
<td>-</td>
</tr>
<tr>
<td>980°C</td>
<td>1 h</td>
</tr>
<tr>
<td>980°C - RT</td>
<td>-</td>
</tr>
<tr>
<td>RT - 720°C</td>
<td>-</td>
</tr>
<tr>
<td>720°C</td>
<td>8 h</td>
</tr>
<tr>
<td>720°C - 620°C</td>
<td>2 h</td>
</tr>
<tr>
<td>620°C</td>
<td>8 h</td>
</tr>
<tr>
<td>620°C - RT</td>
<td>-</td>
</tr>
</tbody>
</table>

### Chemical and Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material composition</td>
<td></td>
</tr>
<tr>
<td>Ni (50 - 55 %)</td>
<td></td>
</tr>
<tr>
<td>Cr (17 - 21 %)</td>
<td></td>
</tr>
<tr>
<td>Nb (4.75 - 5.50 %)</td>
<td></td>
</tr>
<tr>
<td>Mo (2.8 - 3.3 %)</td>
<td></td>
</tr>
<tr>
<td>Ti (0.65 - 1.15 %)</td>
<td></td>
</tr>
<tr>
<td>Al (0.2 - 0.8 %)</td>
<td></td>
</tr>
<tr>
<td>Co ≤ 1 %</td>
<td></td>
</tr>
<tr>
<td>Cu ≤ 0.3 %</td>
<td></td>
</tr>
<tr>
<td>C ≤ 0.08 %</td>
<td></td>
</tr>
<tr>
<td>Si/Mn ≤ 0.35 %</td>
<td></td>
</tr>
<tr>
<td>Relative density</td>
<td>approx. 99.99 %</td>
</tr>
<tr>
<td>Density</td>
<td>8.15 g/cm³</td>
</tr>
</tbody>
</table>

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end-use conditions, etc. Actual values will vary with build conditions. Product specifications are subject to change without notice. The performance characteristics of these materials may vary according to application, operating conditions, or end use. Each user is responsible for determining that the material is safe, lawful and technical suitable for the intended laws and regulations. CRP Meccanica makes no warranties of any kind, express or implied, including, but not limited to, the warranties of merchantability, fitness for a particular use, or warranty against patent infringement. All Trademarks included in this document are property of the respective owner.