**Grade Ergste® 1.4028YN**

Ergste® 1.4028YN is a stainless martensitic chromium steel. This grade shows better spring properties than austenitic or ferritic steel and improved fatigue strength under corrosive stress. Requirement for this is a low-hardened and tempered condition and a shiny, preferably polished surface. In high tempered or annealed condition, the corrosion resistance is reduced.

**Typical Applications**
- Rotary instruments
- Cutter
- Curettes

**Polishability**
Ergste® 1.4028YN is polishable.

**Weldability**
Ergste® 1.4028YN is usually not welded. If welding is unavoidable, the following precautions should be taken: preheating to a temperature range of 572 – 752 °F. Furthermore, annealing after welding is required to regain a certain degree of ductility.

**Machining**
During machining processes, Ergste® 1.4028YN behaves similarly to unalloyed structural steel of the same hardness. Tools should be made of quality high-speed steel or carbide.

**Magnetism**
Ergste® 1.4028YN is magnetizable.

**Hot Working**
Forging temperature is 2,012 – 1,472 °F
Slow cooling

**Corrosion Resistance**
Ergste® 1.4028YN has sufficient resistance in moderate, non-chlorine-containing media. Good corrosion resistance can be observed in oxidizing atmospheres at temperatures exceeding 600 °C. Best corrosion resistance can be achieved with polished surface in the quenched and tempered condition.

**Corresponding Standards**
DIN EN 10088-3 (X30Cr 13)
ASTM F899, AISI 420B (UNS S42000)

**Typical Chemical Composition**

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>P</th>
<th>S</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.26–0.35</td>
<td>max.</td>
<td>max.</td>
<td>1.00</td>
<td>0.040</td>
<td>max.</td>
</tr>
</tbody>
</table>

**Mechanical Properties (Annealed)**

- Tensile strength $R_m$ [ksi] max. 116.0
- Hardness HB max. 245

**Mechanical Properties (Quenched and Tempered)**

- Tensile strength $R_m$ [ksi] 123.3 – 145.0
- Yield strength $R_p0.2$ [ksi] min. 94.3
- Elongation $A$ [%] min. 10
Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulus of Elasticity E 70°F</td>
<td>31,181</td>
<td>ksi</td>
</tr>
<tr>
<td>Specific Density ρ [lb/ in³]</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>Thermal Conductivity λ at 70°F</td>
<td>208.0</td>
<td>Btu in/hr ft²/F</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion α</td>
<td></td>
<td>μin/in °F</td>
</tr>
<tr>
<td>70 - 210 °F</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>70 - 390 °F</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>70 - 570 °F</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>70 - 930 °F</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>Specific Heat at 70°F</td>
<td>0.11</td>
<td>Btu/lb °F</td>
</tr>
<tr>
<td>Specific Electric Resistivity ρ at 70°F</td>
<td>391</td>
<td>Ω circularmil/ft</td>
</tr>
</tbody>
</table>

Heat Treatment

**Soft Annealing**
Temperature: 1,273 – 1,517 °F
Cooling: Air

**Hardening**
Temperature: 1,742 – 1,922 °F
Cooling: Oil, Air

**Tempering**
Temperature: 1,157 – 1,247 °F

Further information regarding our products and locations are available in our image brochure and under www.zapp.com

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