Ergste® 1.4123YN Datasheet US Medical Alloys

Zapp is Certified to ISO 9001

Grade Ergste® 1.4123YN
Ergste® 1.4123YN is a nitrogen alloyed, martensitic, hardenable, stainless steel with extraordinary corrosion resistance and high hardness up to 57 HRC. This material is preferred if special edge retention and abrasive resistance is required.

Typical Fields of Application
Medical instruments e. g.
- Cutting tools
- Drills
- Screwdrivers
- Chisels
- Saw blades

Weldability
Welding is possible without filler metal or with welding wire from 1.4016.

Magnetism
Ergste® 1.4123YN is magnetizable.

Corrosion Resistance
Through the addition of nitrogen, Ergste® 1.4123YN shows an exceptional corrosion resistance.

Chemical Composition

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>Cr</th>
<th>Mo</th>
<th>N</th>
<th>P</th>
<th>S</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.37-0.45</td>
<td>≤ 0.60</td>
<td>≤ 0.60</td>
<td>15.00-16.50</td>
<td>1.50-1.90</td>
<td>0.16-0.25</td>
<td>≤ 0.02</td>
<td>≤ 0.005</td>
<td>0.20-0.40</td>
</tr>
</tbody>
</table>

Corresponding Standards
1.4123 (X40CrMoVN16-2) acc. EN 10088-3
AISI 420Mod acc. to ASTM F899

Product Conditions

<table>
<thead>
<tr>
<th>Bars, ground or ground and polished</th>
<th>Tensile [ksi]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>102-131</td>
</tr>
</tbody>
</table>

* Special conditions on request

Physical Properties

<table>
<thead>
<tr>
<th>Modulus of Elasticity at 68 °F [ksi]</th>
<th>28,282</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity [lb/in³]</td>
<td>0.278</td>
</tr>
<tr>
<td>Thermal Conductivity 68°F [Btu in/hr ft² °F]</td>
<td>166</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion [µin/in °F]</td>
<td>5.78</td>
</tr>
<tr>
<td>68 – 212 °F</td>
<td>5.83</td>
</tr>
<tr>
<td>68 – 392 °F</td>
<td>6.00</td>
</tr>
<tr>
<td>68 – 572 °F</td>
<td>6.17</td>
</tr>
<tr>
<td>68 – 932 °F</td>
<td>6.33</td>
</tr>
<tr>
<td>Specific Heat at 68 °F [Btu/lb °F]</td>
<td>103</td>
</tr>
<tr>
<td>Electric Resistivity at 68 °F [Ω circular-mil/ft]</td>
<td>481</td>
</tr>
</tbody>
</table>
Heat treatment

Soft Annealing
1,436 – 1,508 °F / 7 h / Cooling: Furnace or air

Stress Relief Annealing
302 – 428 °F / 2 x 2 h / Cooling: Air

Hardening
1,832 – 1,922 °F / 0.5 h / Cooling: Oil
Hardening has to be conducted under nitrogen partial pressure to prevent reduction or increase of the nitrogen content.

Tempering
See tempering chart / 2 x 2 h / Cooling: Air

Subzero Refrigeration
-112 – -320.8 °F / 1 h / applied to eliminate remaining austenite at hardening temperatures of > 1850 °F.

Surface Hardening
Ergste® 1.4123YN can be hardened by inductive heating. As initial condition, tempering to 35 – 40 HRC is recommended.

Machining
Ergste® 1.4123YN is characterized by an outstanding machinability.

Hot Working
Forging at 2,228 – 1,832 °F.

Polishability
Ergste® 1.4123YN shows excellent abilities for grinding and polishing.

Tempering Chart (Hardening with Subzero Refrigeration)

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

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