Alloy 321

An austenitic chromium-nickel-titanium stainless steel, Alloy 321 offers outstanding performance at temperatures up to 870°C.

Whilst retaining good strength and corrosion resistance when exposed to high temperatures, Alloy 321 will also maintain its strength and toughness at sub-zero temperatures.

PRODUCT FORMS

<table>
<thead>
<tr>
<th>PRODUCT FORMS</th>
<th>SIZE RANGE FROM</th>
<th>SIZE RANGE TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alloy 321 round bar</td>
<td>9.53 mm</td>
<td>184.15 mm</td>
</tr>
<tr>
<td>Alloy 321 sheet &amp; plate</td>
<td>0.4064 mm</td>
<td>20 mm</td>
</tr>
</tbody>
</table>

Can’t find the size you need? Please contact us at onlinesales@neonickel.com

CHEMICAL ANALYSIS

<table>
<thead>
<tr>
<th>%</th>
<th>CR</th>
<th>NI</th>
<th>MO</th>
<th>CU</th>
<th>TI</th>
<th>C</th>
<th>MN</th>
<th>SI</th>
<th>P</th>
<th>S</th>
<th>N</th>
<th>FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>17</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>5x (C+N)</td>
<td>-</td>
<td>-</td>
<td>0.25</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>19</td>
<td>12</td>
<td>0.75</td>
<td>0.75</td>
<td>0.7</td>
<td>0.08</td>
<td>2</td>
<td>1</td>
<td>0.04</td>
<td>0.03</td>
<td>0.1</td>
<td>Balance</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Aircraft piston engine manifolds
- Expansion joints
- Thermal oxidizers
- Refinery equipment
- High temperature chemical process equipment

Got a Question? techsales@neonickel.com
For more information visit our website www.neonickel.com
ABOUT ALLOY 321

Alloy 321 stainless is a titanium stabilized grade commonly used for service in the 538-870°C temperature range. For service temperatures up to about 870°C, a stabilizing treatment at 842-899°C air cool, may be used to provide optimum resistance to intergranular corrosion in the heat affected zone (HAZ) and to polythionic acid stress corrosion cracking. Alloy 321 stainless is readily welded by all common methods including submerged arc. Appropriate weld fillers are AWS ER347 bare wire and E347 covered electrodes. Alloy 321 stainless is good machinability and is readily fabricated.

For more information on Alloy 321 Stainless contact us, or fill in our online quote form and we'll get right back to you!

PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>7.916 g/cm³</td>
</tr>
<tr>
<td>Melting range</td>
<td>1400 – 1427°C</td>
</tr>
</tbody>
</table>
### MECHANICAL & PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>MECHANICAL &amp; PHYSICAL PROPERTIES</th>
<th>20°C</th>
<th>93°C</th>
<th>204°C</th>
<th>316°C</th>
<th>427°C</th>
<th>538°C</th>
<th>649°C</th>
<th>760°C</th>
<th>871°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient of Thermal Expansion, µm/m°C</td>
<td>-</td>
<td>16.7</td>
<td>16.9</td>
<td>-</td>
<td>18</td>
<td>18.5</td>
<td>19.1</td>
<td>19.6</td>
<td>20</td>
</tr>
<tr>
<td>Thermal Conductivity/ kcal/(hr.m°C)</td>
<td>-</td>
<td>13.1</td>
<td>14.4</td>
<td>-</td>
<td>17</td>
<td>18</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Modulus of Elasticity, Dynamic/ x10^5 MPa</td>
<td>-</td>
<td>1.93</td>
<td>1.83</td>
<td>-</td>
<td>1.64</td>
<td>1.55</td>
<td>1.46</td>
<td>1.36</td>
<td>-</td>
</tr>
<tr>
<td>Ultimate Tensile Strength/ MPa</td>
<td>579.2</td>
<td>-</td>
<td>427.5</td>
<td>427.5</td>
<td>427.5</td>
<td>410.2</td>
<td>110.3</td>
<td>96.5</td>
<td>-</td>
</tr>
<tr>
<td>0.2% Yield Strength/ MPa</td>
<td>262</td>
<td>-</td>
<td>141.3</td>
<td>124.1</td>
<td>117.2</td>
<td>113.8</td>
<td>110.3</td>
<td>96.5</td>
<td>-</td>
</tr>
</tbody>
</table>

### STRESS RUPTURE AND CREEP PROPERTIES

<table>
<thead>
<tr>
<th>STRESS RUPTURE AND CREEP PROPERTIES</th>
<th>566°C</th>
<th>593°C</th>
<th>621°C</th>
<th>649°C</th>
<th>677°C</th>
<th>704°C</th>
<th>732°C</th>
<th>760°C</th>
<th>788°C</th>
<th>816°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Stress Rupture 1,000 hours/ MPa</td>
<td>-</td>
<td>206.8</td>
<td>-</td>
<td>131</td>
<td>-</td>
<td>77.2</td>
<td>-</td>
<td>46.9</td>
<td>-</td>
<td>27.6</td>
</tr>
<tr>
<td>Average Stress Rupture 10,000 hours/ MPa</td>
<td>213.7</td>
<td>162</td>
<td>119.3</td>
<td>88.9</td>
<td>66.9</td>
<td>49.6</td>
<td>37.2</td>
<td>27.6</td>
<td>21</td>
<td>15.9</td>
</tr>
<tr>
<td>Average Stress Rupture 100,000 hours/ MPa</td>
<td>158.6</td>
<td>113.8</td>
<td>82.7</td>
<td>60</td>
<td>43.4</td>
<td>31.7</td>
<td>22.8</td>
<td>16.9</td>
<td>12.1</td>
<td>8.6</td>
</tr>
<tr>
<td>Average Stress for Secondary (minimum) Creep Rate 1% in 1,000 hours/ MPa</td>
<td>206.8</td>
<td>137.9</td>
<td>90.3</td>
<td>60.7</td>
<td>40</td>
<td>26.5</td>
<td>17.6</td>
<td>11.7</td>
<td>7.8</td>
<td>5.2</td>
</tr>
<tr>
<td>Average Stress for Secondary (minimum) Creep Rate 1% in 100,000 hours/ MPa</td>
<td>93.8</td>
<td>63.4</td>
<td>40.7</td>
<td>26.9</td>
<td>17.6</td>
<td>11.7</td>
<td>7.6</td>
<td>5.1</td>
<td>3.3</td>
<td>2.2</td>
</tr>
</tbody>
</table>

### SPECIFICATIONS

- **UNS Number:** UNS S32100
- **W.NR.Number:** 1.4541
- **Standards:** ASTM A240, A276, A312, A479, AMS 5510, 5645