Alloy 625 is a Nickel-Chromium alloy used for its high strength, excellent fabricability and outstanding corrosion resistance. Service temperatures range from cryogenic to 1800 deg.F. Alloy 625 strength is derived from the stiffening effect of molybdenum and columbium on its Nickel-Chromium matrix; thus precipitation-hardening treatments are not required. This combination of elements also is responsible for superior resistance to a wide range of corrosive environments of unusual severity as well as to high-temperature effects such as oxidation and carburization.

### Chemical Composition

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>Mn</th>
<th>S</th>
<th>Si</th>
<th>Cr</th>
<th>Ni</th>
<th>Fe</th>
<th>Mo</th>
<th>Co+Ta</th>
<th>Ti</th>
<th>Al</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN/MAX</td>
<td>0.05</td>
<td>0.30</td>
<td>0.003</td>
<td>0.25</td>
<td>20.00 - 23.00</td>
<td>Balance</td>
<td>4.00</td>
<td>9.00</td>
<td>8.50</td>
<td>0.30</td>
<td>0.30</td>
<td>0.015 max</td>
</tr>
</tbody>
</table>

### Applicable Specifications

<table>
<thead>
<tr>
<th>Pipe</th>
<th>Pipe Welded</th>
<th>Tube Seamless</th>
<th>Sheet/Plate</th>
<th>Bar</th>
<th>Tube Welded</th>
<th>Fitting</th>
<th>Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM B444</td>
<td>ASTM B705</td>
<td>ASTM B444</td>
<td>ASTM B443</td>
<td>ASTM B446</td>
<td>ASTM B704</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Applications

- Nuclear water reaction components
- Bellows and expansion joints
- Jet engine exhaust systems
- Seawater applications
- Chemical processing equipment handling mixed acids
- Engine thrust-reverser systems

### Physical Properties

<table>
<thead>
<tr>
<th>Density</th>
<th>0.305 lb/in³</th>
<th>49.6 microhm-in. @200°F</th>
<th>7.3 microinches/in·°F @ 70-400°F</th>
<th>68 Btu-in./ft²·°F @70°F</th>
<th>205.8 kN/mm²</th>
<th>0.102 Btu/lb·°F</th>
<th>2350-2460 °F</th>
<th>8.44</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.44 g/cm³</td>
<td>1.26 microhm-m @100°C</td>
<td>13.1 x 10(-6)m/m·°C @ 21-204°C</td>
<td>9.8 W/M·°C @20°C</td>
<td>29849 ksi</td>
<td>429 J/kg·°C</td>
<td>1290-1350°C</td>
<td>8.44</td>
<td></td>
</tr>
</tbody>
</table>

### Maximum Pressure Work

\[ P = \frac{2T \times S}{D} \]

\[ S = \text{Minimum tensile strength of material for a specific temper (in psi) from Mechanical properties table) } \]

\[ D = \text{Exterior diameter of tube} \]

\[ T = \text{Wall thickness of tube} \]

### Non Destructive Tests

- Eddy Current Testing
- Hydrostatic Testing
- An Underwater Testing
- Ultrasonic Testing
- (PMI) Positive Material Identification

### Destructive Tests

- Microstructure Test
- Tensile Test
- Expansion Test
- Optical Spectrometry Test