Monel 400 is a nickel-copper alloy (about 67% Ni – 23% Cu) that is resistant to sea water and steam at high temperatures as well as to salt and caustic solutions. Stronger than pure nickel, Monel is resistant to corrosion by many agents, including rapidly flowing seawater. The alloy can be fabricated readily by hot- and cold-working, machining, and welding. Monel is a solid-solution binary alloy. As nickel and copper are mutually soluble in all proportions, it is a single-phase alloy. It is resistant to corrosion and acids, and some alloys can withstand a fire in pure oxygen. It is commonly used in applications with highly corrosive conditions. Monel 400 has great mechanical properties at subzero temperatures, can be used in temperatures up to 1000° F, and its melting point is 2370-2460° F. However, alloy 400 is low in strength in the annealed condition so, a variety of tempers may be used to increase the strength. Monel 400 is used in aerospace, oil production and refining, marine, musical instrument and other applications requiring high corrosion resistance, good weldability and high strength.

**CHEMICAL COMPOSITION**

<table>
<thead>
<tr>
<th></th>
<th>Cu</th>
<th>Fe</th>
<th>C</th>
<th>Mn</th>
<th>Ni</th>
<th>S</th>
<th>Si</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN/MAX</td>
<td>28.0-34.0</td>
<td>2.5</td>
<td>0.3</td>
<td>2.0</td>
<td>63.0</td>
<td>.024</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**APPLICABLE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Pipe</th>
<th>Fitting</th>
<th>Bar</th>
<th>Sheet/Plate</th>
<th>Tube, Seamless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welded</td>
<td>Seamless</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASTM B725</td>
<td>ASTM B564</td>
<td>ASTM B164</td>
<td></td>
<td>ASTM B39S</td>
</tr>
</tbody>
</table>

**APPLICATIONS**

- Marine engineering
- Industrial heat exchangers
- Chlorinated solvents
- Crude petroleum stills
- De-aerating heaters
- Valves, pumps, shafts, fittings, and fasteners
- Chemical and hydrocarbon processing equipment
- Gasoline and freshwater tanks
- Crude oil distillation towers
- Boiler feed water heaters and other heat exchangers

**PHYSICAL PROPERTIES**

<table>
<thead>
<tr>
<th></th>
<th>Density</th>
<th>Tensile Strength – Annealed min.</th>
<th>Tensile Strength – Stress Relieved min.</th>
<th>Yield Strength – Annealed min.</th>
<th>Yield Strength – Stress Relieved min.</th>
<th>CTE, linear</th>
<th>Specific Heat Capacity</th>
<th>Thermal Conductivity</th>
<th>Melting Point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.318 lb/in³</td>
<td>70 ksi</td>
<td>85 ksi</td>
<td>28 ksi</td>
<td>55 ksi</td>
<td>7.7 in/in°F x 10-6 @ 200°F</td>
<td>0.105 Btu/lb°F @ 200°F</td>
<td>167 Btu-in/ft²°F @ 200°F</td>
<td>2370 – 2460°F</td>
</tr>
<tr>
<td></td>
<td>8.80 g/cc</td>
<td>483 MPa</td>
<td>586 MPa</td>
<td>193 MPa</td>
<td>379 MPa</td>
<td>14.2 μm/m•°C @ 100°C</td>
<td>445 J/kg•°C @ 100°C</td>
<td>24.0 W/m•°C @ 100°C</td>
<td>1300 – 1350°C</td>
</tr>
</tbody>
</table>

**MAXIMUM PRESSURE WORK**

\[ P = \text{Maximum work pressure (psi)} \]

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

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

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

\[ P = DT \times S \]

**NON DESTRUCTIVE TESTS**

- Eddy Current Testing
- Hydrostatic Testing
- Ultrasonic Testing
- Optical Spectrometry Test

**DESTRUCTIVE TESTS**

- Microstructure Test
- Tensile Test
- Expansion Test

**Request Quote**