NIMONIC® alloy PE11 is a nickel-iron-chromium alloy, precipitation hardened by titanium and aluminum and solid solution strengthened by an addition of molybdenum. It was developed as a high-strength sheet alloy for use at temperatures to 1020°C (550°F). The high iron content provides good workability and also relatively high tensile ductility, especially after welding. Used for components of gas turbines.

**Physical Constants & Thermal Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, g/cm³</td>
<td>8.02</td>
</tr>
<tr>
<td>lb/in³</td>
<td>0.290</td>
</tr>
<tr>
<td>Melting range, °C</td>
<td>1280-1350</td>
</tr>
<tr>
<td>°F</td>
<td>2340-2460</td>
</tr>
<tr>
<td>Specific Heat, J/kg-°C (20°C)</td>
<td>436</td>
</tr>
<tr>
<td>Btu/lb-°F</td>
<td>0.104</td>
</tr>
<tr>
<td>Permeability at 300 oersted</td>
<td>1.021</td>
</tr>
</tbody>
</table>

**Table 1 - Limiting Chemical Composition, %**

<table>
<thead>
<tr>
<th>Element</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel</td>
<td>37.0</td>
<td>41.0</td>
</tr>
<tr>
<td>Iron</td>
<td>Balance*</td>
<td>Balance*</td>
</tr>
<tr>
<td>Chromium</td>
<td>17.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>4.75</td>
<td>5.75</td>
</tr>
<tr>
<td>Titanium</td>
<td>2.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Aluminum</td>
<td>0.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Carbon</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>Silicon</td>
<td>0.5 max</td>
<td>0.5 max</td>
</tr>
<tr>
<td>Copper</td>
<td>0.5 max</td>
<td>0.5 max</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.2 max</td>
<td>0.2 max</td>
</tr>
<tr>
<td>Cobalt</td>
<td>1.0 max</td>
<td>1.0 max</td>
</tr>
<tr>
<td>Boron</td>
<td>0.001 max</td>
<td>0.001 max</td>
</tr>
<tr>
<td>Zirconium</td>
<td>0.02-0.05</td>
<td>0.02-0.05</td>
</tr>
<tr>
<td>Sulfur</td>
<td>0.015 max</td>
<td>0.015 max</td>
</tr>
</tbody>
</table>

*Reference to the ‘balance’ of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.
NIMONIC® alloy PE11

Mechanical Properties

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Rupture Strength (1000 h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>°C</td>
</tr>
<tr>
<td>1200</td>
<td>650</td>
</tr>
<tr>
<td>1300</td>
<td>705</td>
</tr>
<tr>
<td>1400</td>
<td>760</td>
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Available Products and Specifications

NIMONIC alloy PE11 is available as sheet, plate, round bar, flat bar, forging stock and wire.

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