STEEL BARS FOR MISSILES

Aubert & Duval has a long history in supplying material to missiles systems manufacturers. As a leading supplier of defense high performance steels, Aubert & Duval supports missiles manufacturing sector.

Choose the best designed grade for your application

Due to its expertise, Aubert & Duval develops and produces a range of precipitation hardening steels that quite meet the missile producers/designers needs:

+ High UTS up to 2000 MPa
+ Simple heat treatment
+ Control of distortions during the process
+ Best compromise between UTS and toughness (at room and low temperatures)
+ Welding and flowforming ability
+ Corrosion and stress corrosion cracking resistance

Customer benefits

+ Weight optimization
+ Customized alloys grades
+ A global supplier of the missiles systems manufacturers
+ Technical Support
+ Dedicated R&D Team

Product range

Forged and rolled bars for:

+ Surface to air
  Anti-aircraft
  Anti-ballistic
+ Air to air
+ Ballistic
  Cruise missile
  Anti-ship
  Anti-tank
Precipitation hardening steels are key candidates to fulfill requirements for missiles structural parts such as body, frames and hangers:

+ High static and fatigue properties
+ Best combination of high strength and high toughness (even at low temperature)
+ High stress corrosion cracking performances
+ Suitable for welding and flowforming

Non stainless steels

<table>
<thead>
<tr>
<th>Type</th>
<th>819B</th>
<th>819AW</th>
<th>MARVAL™18</th>
<th>MY19</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN designation</td>
<td>36CrNiMo16</td>
<td>36CrNiMo16</td>
<td>Maraging 250</td>
<td>Maraging 300</td>
</tr>
<tr>
<td>UTS (MPa)</td>
<td>≥ 1230</td>
<td>≥ 1760</td>
<td>≥ 1720</td>
<td>≥ 1930</td>
</tr>
<tr>
<td>YS 0.2% (MPa)</td>
<td>≥ 1030</td>
<td>≥ 1420</td>
<td>≥ 1600</td>
<td>≥ 1860</td>
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<tr>
<td>EI (%)</td>
<td>≥ 8</td>
<td>≥ 6</td>
<td>≥ 6</td>
<td>≥ 5</td>
</tr>
<tr>
<td>KV (J)</td>
<td>≥ 25</td>
<td>≥ 17</td>
<td>≥ 15</td>
<td>≥ 12</td>
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Stainless steels

<table>
<thead>
<tr>
<th>Type</th>
<th>APX™4</th>
<th>X17U4</th>
<th>X15USW</th>
<th>MARVAL™X12</th>
<th>MARVAL™X13X</th>
<th>MARVAL™X12H</th>
<th>MLX™17</th>
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<tbody>
<tr>
<td>EN designation</td>
<td>X4CrNiMo16-5-1</td>
<td>17-4PH</td>
<td>15-5PH</td>
<td>X1CrNiMoTiAl12-2-9</td>
<td>PH13-8Mo</td>
<td>X1CrNiMoTiAl12-10</td>
<td>X1CrNiMoTiAl12-11</td>
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<tr>
<td>UTS (MPa)</td>
<td>≥ 950/1050</td>
<td>≥ 700</td>
<td>≥ 1000</td>
<td>≥ 1200</td>
<td>≥ 1200</td>
<td>≥ 1400</td>
<td>≥ 1520</td>
</tr>
<tr>
<td>YS 0.2% (MPa)</td>
<td>≥ 700</td>
<td>≥ 900</td>
<td>≥ 1000</td>
<td>≥ 1100</td>
<td>≥ 1140</td>
<td>≥ 1300</td>
<td>≥ 1380</td>
</tr>
<tr>
<td>EI (%)</td>
<td>≥ 16</td>
<td>≥ 14</td>
<td>≥ 10</td>
<td>≥ 12</td>
<td>≥ 10</td>
<td>≥ 9</td>
<td>≥ 10</td>
</tr>
<tr>
<td>KV RT (J)</td>
<td>≥ 120</td>
<td>≥ 100</td>
<td>≥ 80</td>
<td>≥ 90</td>
<td>≥ 40</td>
<td>≥ 50</td>
<td>≥ 30</td>
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<tr>
<td>KV -40° (J)</td>
<td>≥ 70</td>
<td>≥ 60 (-30°C)</td>
<td>≥ 35(-30°C)</td>
<td>≥ 30</td>
<td>-</td>
<td>≥ 20</td>
<td>-</td>
</tr>
</tbody>
</table>

Ni-based alloys

For high temperature applications, Aubert & Duval provides Ni-based alloys:

AD730®
PYRADS3NW (INCO718)

www.aubertduval.com