High-performance alloys for FIREARMS

Enhancing your performance
Reliability and performance to meet your safety requirements

Gun barrels

Aubert & Duval offers for this application three martensitic grades achieving the best high strength / toughness compromise on the market: ARMAD® and GKH® (CrMoV martensitic grades), and APX4 (martensitic stainless grade).

For barrels submitted to a transverse load during firing, a specific care has been placed on transverse properties of bars. Aubert & Duval grades (ARMAD®, GKH® and APX4) present a highly isotropic structure given to the material stable properties when longitudinal and transverse directions are compared.

Mechanism parts

For firing pins, extractors, ejectors, breeches...

All main parts in gun mechanisms are submitted to shock, intensive wear and are expected to exhibit the highest fatigue performances possible.

Services & Capabilities

- In house fully integrated production process
- NADCAP Heat Treatment
- Approved by major NATO gun manufacturers
- Logistics service provider
- Dedicated products for all manufacturing processes: drilling, machining, cold forming (hammer forging, swaging)
- ISO 9001, ISO 14001, OHSAS 18001
- Full Authorized Economic Operator (AEO)
Reliability and performance to meet your safety requirements

Gun barrels

- Round and flat bars
- Customized cuts
- Fine and isotropic microstructure (x100)
- Standard CrMoV

Customer benefits directly coming from our metallurgical expertise

- Use higher deformation yields of cold hammering and preserve more material compared with other grades
- Save production costs by cold hammering both chamber and gun barrel limiting misalignment between chamber and gun barrel.
- Use fatigue/strength upgrading opportunities of GKH® and ARMAD® to design lighter barrels.
- Ensure stable process and limit troubles during manufacturing
- Ensure perfect straightness during the cold hammering / swaging operation
- Core properties not impacted by nitriding/nitrocarburizing
- Exceptional safety margin regarding torture tests

Benefits for firearm user:

- Keeps perfect straightness during intensive firing and retains accuracy and safety
- Has longer fatigue lifetime, limiting bore ovalization, which causes a lack of accuracy
- Use a lighter weapon

Benefits for firearm producer/designer:

- Use higher deformation yields of cold hammering and preserve more material compared with other grades
- Save production costs by cold hammering both chamber and gun barrel limiting misalignment between chamber and gun barrel.
- Use fatigue/strength upgrading opportunities of GKH® and ARMAD® to design lighter barrels.
- Ensure stable process and limit troubles during manufacturing
- Ensure perfect straightness during the cold hammering / swaging operation
- Core properties not impacted by nitriding/nitrocarburizing
- Exceptional safety margin regarding torture tests

Mechanical properties after heat treatment:

<table>
<thead>
<tr>
<th>Type</th>
<th>APX4</th>
<th>GKH®</th>
<th>ARMAD®</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN designation</td>
<td>X4CrNiMo16-5-1</td>
<td>33CrMoV12-9</td>
<td>32CrMoV12-10</td>
</tr>
<tr>
<td>HRC as delivered</td>
<td>28/34</td>
<td>28/34</td>
<td>28/34</td>
</tr>
<tr>
<td>HRC after final hardening</td>
<td>38/42</td>
<td>38/42</td>
<td>38/46</td>
</tr>
<tr>
<td>UTS (MPa)</td>
<td>900/1050</td>
<td>930/1080</td>
<td>1200/1250</td>
</tr>
<tr>
<td>YS 0,2 (MPa)</td>
<td>≥ 700</td>
<td>≥ 750</td>
<td>&gt; 950</td>
</tr>
<tr>
<td>ASD (%)</td>
<td>≥ 16</td>
<td>≥ 15</td>
<td>&gt; 16</td>
</tr>
<tr>
<td>KV (RT) J</td>
<td>≥ 120</td>
<td>≥ 140</td>
<td>&gt; 160</td>
</tr>
<tr>
<td>KV (-40°C) J</td>
<td>≥ 90</td>
<td>≥ 130</td>
<td>&gt; 130</td>
</tr>
</tbody>
</table>

Learn more with our dedicated technical brochures available on our website www.aubertduval.com
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