



STEEL BARS FOR FIREARMS

As leading supplier of high quality steels for firearm industry, Aubert & Duval has over 65 years' experience in this defense market segment. It serves the weapon manufacturing sector for cut rifling, button rifling and hammer forging processes.

Gun barrels

Aubert & Duval offers martensitic steel grades achieving the best high strength / toughness compromise on the market:

- GKH® and ARMAD™ (CrMoV martensitic steel grades)
- APX®4 (martensitic stainless-steel grade)

For barrels that withstand a transverse load during firing, specific care has been given to bars' transversal properties. GKH®, ARMAD™ and APX®4 present an isotropic structure giving the material equivalent tensile, ductility and toughness properties, resulting from Aubert & Duval's high-tech production process.

These grades can be used with cut rifling, button rifling or cold hammer forging process.



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Customer benefits

- + High endurance, even in extreme environmental conditions
- + Long cycle life & High accuracy
- + Weight optimization
- + Resistance to intensive fire rates
- + New powerful ammunitions
- + Customized alloys grades
- + A global supplier of the weapon systems manufacturers
- + Technical Support
- + Dedicated R&D Team

Services

- + In-house fully integrated production process
- + Small MOQ possibility: 1500 kg
- + Random lengths or customized blank lengths

Firearm metallurgical expertise

Benefits for firearm producers/designers

- Higher cold hammering rates, saving material compared with other grades
- Possibility of manufacturing the chamber during the cold hammering process.
- GKH® and ARMAD™'s fatigue/strength upgrading gives opportunities to lighter barrel design with thinner wall sections
- Possibility with ARMAD™ to achieve toughness and very good nitriding capability.
- Ensuring stable process and limit disruptions at customer shop
- Ensuring perfect straightness and surface roughness during the cold hammering / button rifling operation

Steels for gun barrels

GKH®

Many years ago, Aubert & Duval developed the GKH steel grade for gun barrels. GKH® steel (32CrMoV12) heat treated for 28-32 HRC which presents exceptional ductility and toughness including in transverse direction thanks to its homogeneous microstructure nearly free of banding.

ARMAD™

The development of new ammunitions with increased pressure and temperature in the chamber and barrel has been the driving force to improve mechanical properties at elevated temperature and resistance to wear during firing. ARMAD™ steel grade has been developed for these purposes aiming at higher mechanical properties up to 650°C without impairing ductility and toughness.

| | APX4 | GKH® | ARMAD™ |
|------------------|-----------------------|-------------------|-------------------|
| Type | Martensitic stainless | Martensitic CrMoV | Martensitic CrMoV |
| EN designation | X4CrNiMo16-5-1 | 33CrMoV12-2 | 32CrMoV12-10 |
| HRC as delivered | 28/34 | 28/34 | 28/34 |
| UTS (MPa) | 900/1050 | 930/1080 | 1200/1250 |
| YS 0,3 (MPa) | ≥ 700 | ≥ 750 | > 950 |
| A5d (%) | ≥ 16 | ≥ 15 | > 16 |
| KV (RT) | ≥ 120 | ≥ 140 | > 160 |
| KV (hgfh) | ≥ 90 | ≥ 130 | > 130 |

High Performance Steels for mechanism parts

For firing pins, extractors, ejectors, breeches (carburizing steels, nitriding steels and maraging steels).

| | |
|----------|----------------|
| FADH | 14NiCrMo13-4 |
| FDC | 20NiCrMo13-4 |
| FND | 15NiMoSiCr10 |
| FDMA | 30NiCrMo16 |
| 819B | 36NiCrMo16 |
| 819AW | E35NiCrMo16 |
| MARVAL18 | X2NiCoMo18-8-5 |

APX®4

When corrosion resistance is needed or in the case where no corrosion protection is present (hard chromium plating of black chromium), manufacturers often used martensitic stainless steels. The most common grade is AISI 416 martensitic stainless steel. The steel contains high amount of sulfur favorable to boring and machining. Aubert & Duval has developed for these application APX®4 martensitic stainless steel.



Gun Barrel Shape Evolution during the Forming Process

