AUBERT&DUVAL

Steel

R6110

X38CrMoV5-3

SPECIFICATIONS

European standard:

EN : X38CrMoV5-3
AFNOR: X38CrMoV5-3
W.Nr : 1.2367
DIN : X38CrMoV5-5

COMPOSITION

Carbon	0.40
Chromium	5.00
Moybdenum	3.00
Vanadium	0.50

APPLICATIONS

- Inserts and punches for drop-stamping and forging
- Dies for light alloy die casting
- Extrusion tools

PHYSICAL PROPERTIES

- Density: 7.7

- Mean coefficient of expansion in m/m.°C:
  - between 20°C and 100°C: 11.0×10^{-6}
  - between 20°C and 300°C: 11.8×10^{-6}
  - between 20°C and 500°C: 12.8×10^{-6}
  - between 20°C and 700°C: 13.4×10^{-6}

- Critical points:
  - Ac 1: 830°C
  - Ac 3: 885°C

CHARACTERISTICS

- Good resistance to high temperature oxydation
- Low sensitivity to thermal shock
- Excellent resistance to wear
- Excellent dimensional stability

STRUCTURE IN THE ANNEALED CONDITION

According to process B2196

Correct structure
(Mx500)

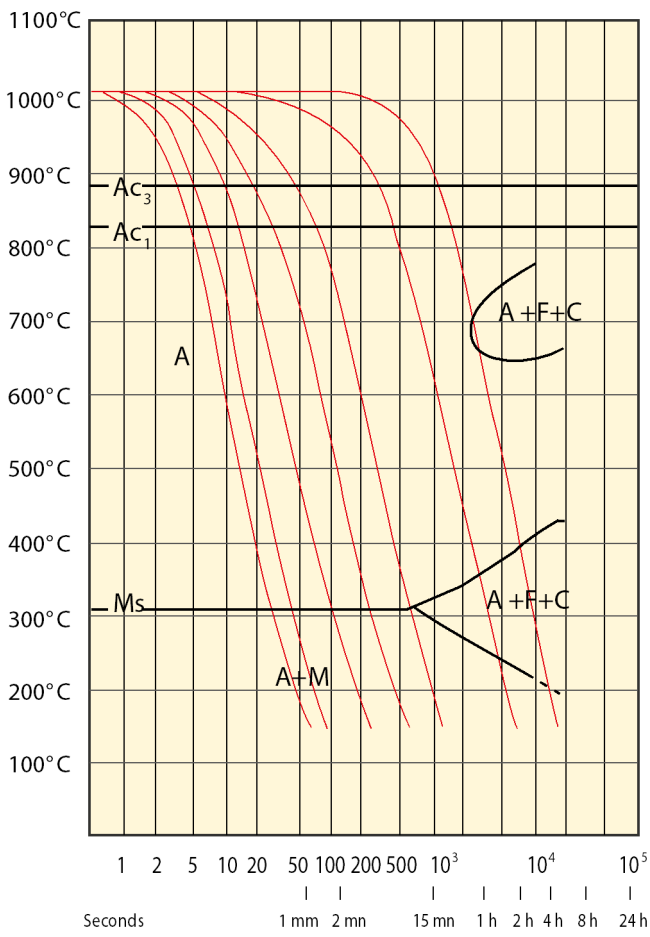
- Brinnel hardness of approximately 235 in the softened condition.

HEAT TREATMENT

- Harden:
  - Preheat to 750°C.
  - Raise to 1000°C
  - Air cool or gas pressure quench

For large parts, air cooling may be replaced by quenching into a salt bath at 240°C, followed by cooling in air to room temperature.

It is recommended that heating should take place in a neutral atmosphere.



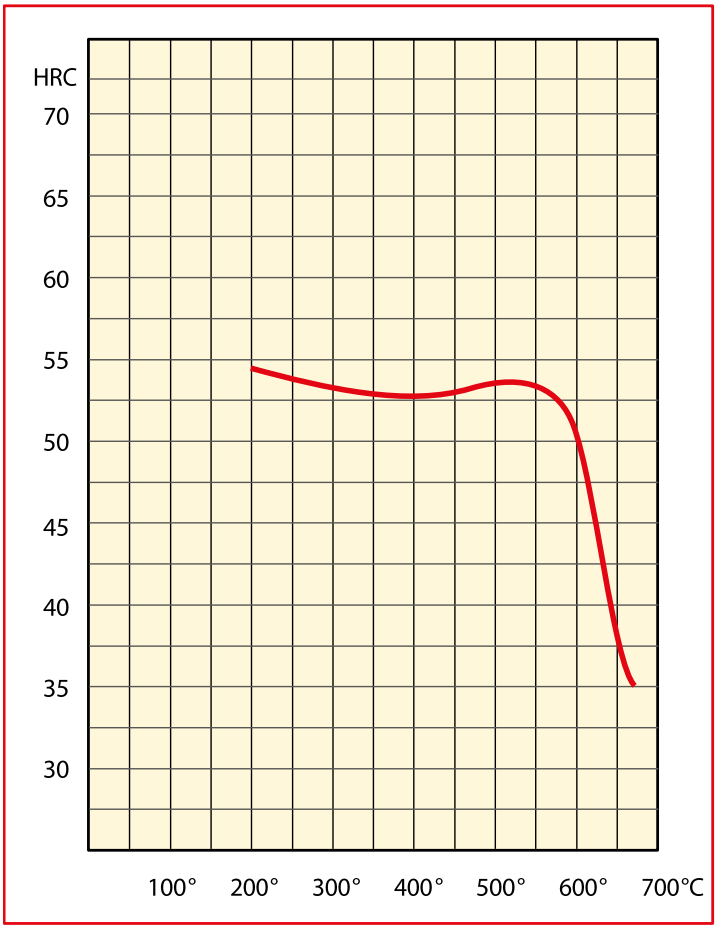
CCT DIAGRAM

Austenitizing at 1010°C

HEAT TREATMENT

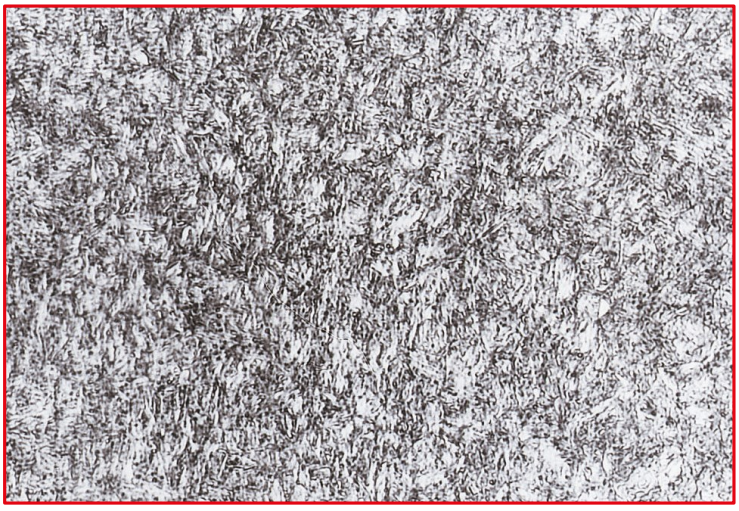
- Temper:
  - 1st temper at 550°C
  - 2nd temper between 550°C and 650°C according to hardness required

TEMPERING CURVE



TEMPERING CURVE

1 cm thick test piece

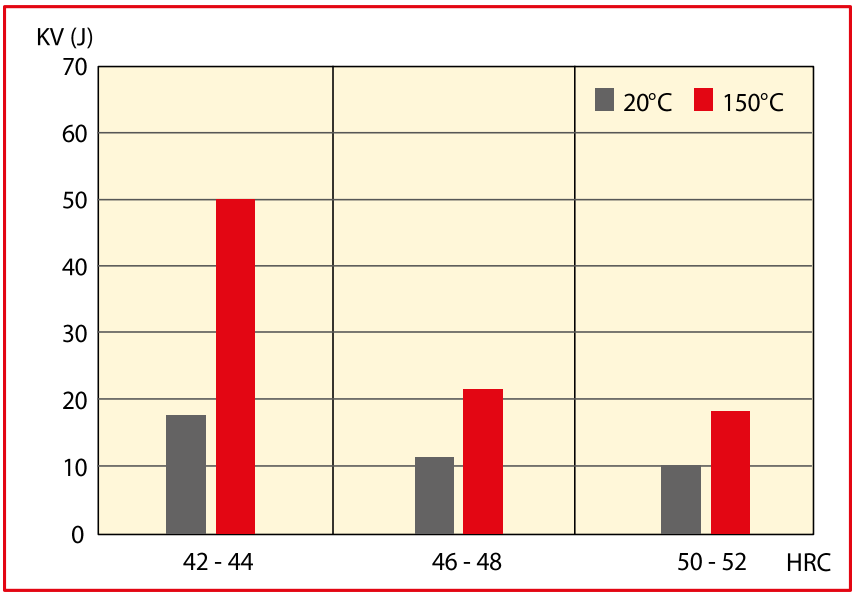


STRUCTURE AFTER HEAT TREATMENT

According to process B2196

Correct structure
(Mx500)

MECHANICAL PROPERTIES



VARIATION OF IMPACT STRENGTH WITH HARDNESS FOR DIFFERENT WORKING TEMPERATURES

• We recommended adequate preheating before commissioning the tools to increase their thoughness

SURFACE TREATMENT

• R6110 is suitable for all nitriding processes. This treatment results in a hard surface layer providing improved resistance to erosion and wear. The hardness obtained after nitriding treatment is of the order of 1000 Vickers.

Contact:

www.aubertduval.com