

SPECIFICATIONS

X23NiCoCrMoAl13-6-3

COMPOSITION

Carbon	0.23
Nickel.....	13.00
Cobalt.....	6.00
Chromium.....	3.25
Molybdenum.....	1.50
Aluminum.....	1.50
Vanadium.....	0.25

TYPICAL MECHANICAL PROPERTIES

- After annealing:
Brinell hardness: 400 HB

HEAT TREATMENT REFERENCE

- After aging at 495°C / 10hrs:
 - UTS: 2220 N/mm²
 - 0.2 % Yield strength: 1900 N/mm²
 - Elongation (5d): 10 %
 - Reduction of area: 50%
 - Toughness K1c: 41 MPa√m

APPLICATIONS

- Aerospace applications including shafts, heavily loaded parts, fasteners.
- Nitriding parts.

CHARACTERISTICS

- Precipitation Duplex hardening type steel, vacuum melted and consumable electrode remelted grade.
- Very high ultimate and yield strength steel with high toughness.
- Surface hardening by nitriding is possible.

HEAT TREATMENT

- Delivered condition:
The steel is delivered annealed.
- Aging:
After solution treatment, a temper at 200°C / 10 hrs is recommended for machining. The final properties are obtained by aging at 480°C to 520°C for 10 hrs.

PHYSICAL PROPERTIES

- Density: 7.8
- Mean coefficient of expansion in m/m.°C:
 - between 20°C and 100°C: 10.4×10^{-6}
 - between 20°C and 300°C: 11.1×10^{-6}
 - between 20°C and 500°C: 11.7×10^{-6}
- Young modulus in N/mm²:
 - at 20°C: 195×10^3
- Thermal conductivity in W.m/m², °C:
 - at 20°C: 19
 - at 500°C: 27
- Critical points:
 - Ac 1: 605°C
 - Ac 3: 855°C

Contact:

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The data provided in this document represent typical or average values rather than maximum or minimum guaranteed values. The applications indicated for the grades described are given as guidance only in order to help the reader in his personal assessment. Please note that these do not constitute a guarantee whether implicit or explicit as to whether the grade selected is suited to specific requirements. Aubert & Duval's liability shall not under any circumstances extend to product selection or to the consequences of that selection.