AUBERT&DUVAL

# Steel

# NC40SW

40NiSiCrMo7

Melting: Electrode consumable remelted steel

## SPECIFICATIONS

European standards:

- 40NiSiCrMo7

BS : S 155
UNS : K44220
AMS : 6417 - 6419
AISI : 300M

## COMPOSITION

| | |
|---|---|
| Carbon | 0.40 |
| Nickel | 1.80 |
| Silicon | 1.60 |
| Chromium | 0.85 |
| Molybdenum | 0.40 |

## TYPICAL MECHANICAL PROPERTIES

- Annealed condition: heat to 780°C followed by slow cooling.
  - Brinell hardness: 240

- Oil quench from 870°C. Temper at 600°C.
  - UTS: 1450 $N/mm^2$
  - 0.2 % Yield strength: 1300 $N/mm^2$
  - Elongation (5d): 14 %
  - Impact strength KCU: 60 $J/cm^2$

### HEAT TREATMENT REFERENCE

- Oil quench from 870°C. Double temper at 300°C.
  - UTS: 2050 $N/mm^2$
  - 0.2 % Yield strength: 1700 $N/mm^2$
  - Elongation (5d): 12 %
  - Impact strength KCU: 50 $J/cm^2$

## APPLICATIONS

- Shafts.
- Gears.
- Various mechanical parts.
- Heavily stressed aerospace parts.

## CHARACTERISTICS

- Melting: consumable electrode remelted steel.
- High mechanical properties.
- Good resistance to impact and fatigue.
- Maintains good properties at high temperatures.

## HEAT TREATMENT

- Normalizing:
  - Heat to 925°C.
  - Air cool.
- Harden:
  - Heat to 870°C.
  - Oil quench.
- Temper:
  - Depending on properties required.

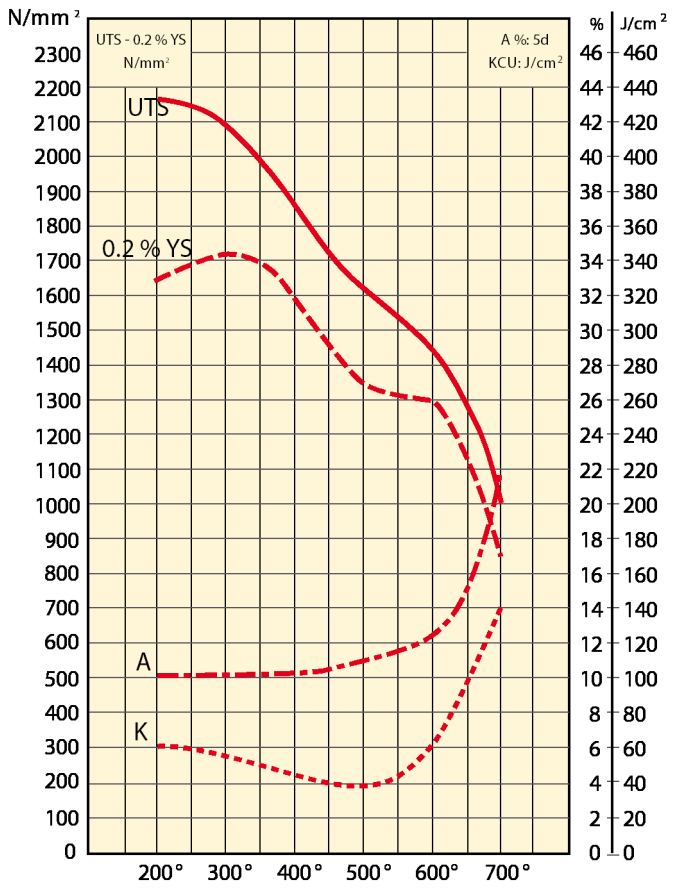
## PHYSICAL PROPERTIES

- Density: 7.8
- Mean coefficient of expansion in m/m.°C:
  - between 20°C and 100°C: 11.5 x $10^{-6}$
  - between 20°C and 700°C: 14.0 x $10^{-6}$
- Critical points:
  - Ac 1: 725°C
  - Ac 3: 870°C

## FORGING

- 1100/900°C

## TEMPERING CURVE




Heated to 870°C, oil quenched.

(Heat treatment on rough machined blanks)


**Contact:**

**www.aubertduval.com**