AUBERT&DUVAL

Steel

FDG®

20NiCrMo13-4

Variant:
FDGW : Consumable electrode remelted steel

SPECIFICATIONS

European standards:
- 20NiCrMo13-4
- Numerical designation: 1.6660

UNS : K41910
AMS : 6492

For the remelted grade:
UNS : K41910
AMS : 6493

COMPOSITION

Carbon	0.20
Nickel	3.20
Chromium	1.00
Molybdenum	0.50

TYPICAL MECHANICAL PROPERTIES

- Annealed condition: heat to 675°C followed by slow cooling.
  - Brinell hardness: 235

HEAT TREATMENT REFERENCE

- Oil quench from 825°C. Sub-zero treatment (-70°C). Temper at 150°C.
  (properties beneath the carburized layer).
  - UTS: 1450 N/mm^2
  - 0.2 % Yield strength: 1100 N/mm^2
  - Elongation (5d): 13 %
  - Impact strength KV: 130 J

- Gas quench (3 bars) from 825°C. Sub-zero treatment (- 70°C) Temper at 150 °C.
  (properties beneath the carburized layer).
  - UTS: 1350 N/mm^2
  - 0.2% Yield strength: 1000 N/mm^2
  - Elongation (5d): 13%
  - Impact strength KV: 110 J

APPLICATIONS

- Gears subjected to high stresses, diverse parts subject to wear and fatigue in service.
- In the quenched and tempered condition: safety-critical parts.

CHARACTERISTICS

- High mechanical properties.
- Good fatigue strength.
- After carburizing, quenching and tempering, the surface hardness is around 700 HV.
- For some carburizing applications, oil quenching can be replaced with gas pressure quenching in order to minimise distortion due to the heat treatment.
  The mechanical properties thus obtained are equivalent to those of the FADH grade.

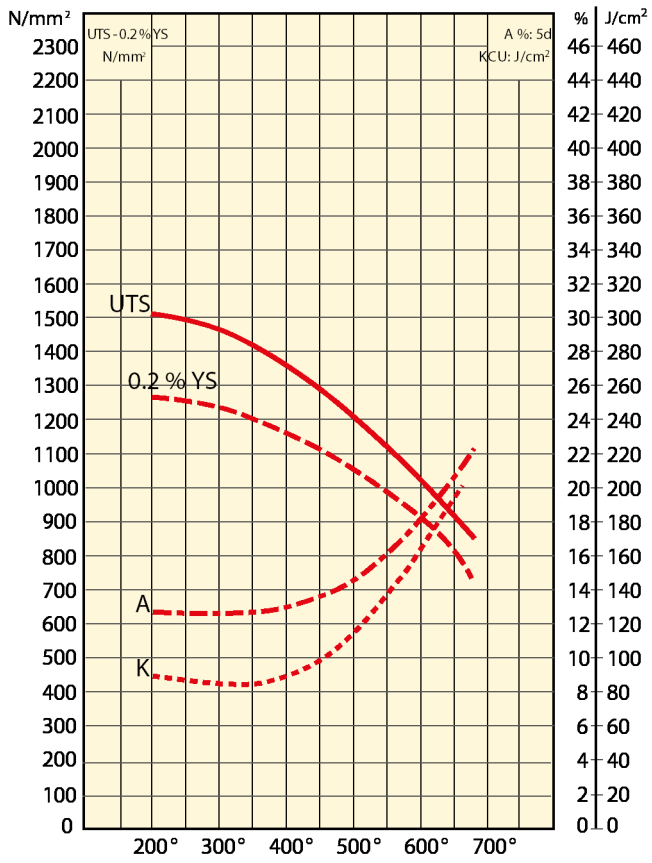
HEAT TREATMENT

- Carburizing
  - 900°C approx.
- Harden
  - Heat to 825/850°C.
  - Oil or gas pressure quench.
- Temper
  - After carburizing, quenching and sub-zero treatment, the steel is tempered between 140°C and 200°C as required.
  - For use in the non carburized condition, temper in accordance with properties required.

PHYSICAL PROPERTIES

- Density: 7.8
- Mean coefficient of expansion in m/m.°C:
  - between 20°C and 100°C: 11.3×10^{-6}
  - between 20°C and 700°C: 13.8×10^{-6}
- Critical points:
  - Ac 1: 680°C
  - Ac 3: 820°C

TEMPERING CURVE



Heated to 825°C, oil quenched

(Heat Treatment on rough machined blanks)

FORGING

- 1100/900°C

Contact:

www.aubertduval.com