AUBERT&DUVAL

Nickel-based Alloy

PYRAD53NW

NiCr19Fe19Nb5Mo3

SPECIFICATIONS

European standards:

- NiCr19Fe19Nb5Mo3
- Numerical designation: 2.4668

AIR : NC 19 FeNb
WL : 2.4668
UNS : N07718
AMS : 5662 - 5663

COMPOSITION

Carbon	0.04
Iron	18.50
Chromium	18.00
Niobium	5.20
Molybdenum	3.00
Titanium	0.90
Aluminum	0.50
Nickel	Base

TYPICAL MECHANICAL PROPERTIES

On metal supplied ready for use:

- Tensile test at ambient temperature:
  - UTS: 1360 N/mm^2
  - 0.2 % Yield strength: 1120 N/mm^2
  - Elongation (5d): 18 %
- Tensile test at 600°C:
  - UTS: 1150 N/mm^2
  - 0.2 % Yield strength: 1000 N/mm^2
  - Elongation (5d): 19 %
- Tensile test at 700°C:
  - UTS: 1010 N/mm^2
  - 0.2 % Yield strength: 900 N/mm^2
  - Elongation (5d): 23 %
- Creep:

Temperature in °C	Average load in N/mm^2 causing creep fracture in 1000 hrs
600	760
650	540
700	350
750	140

APPLICATIONS

- Aerospace industry: compressor discs.
- Marine and land-based machines.
- Fasteners or diverse components requiring a particularly high yield strength and which must also be stainless or non magnetic.

CHARACTERISTICS

Precipitation hardened, nickel-based superalloy with:

- Good resistance to high temperature oxidation.
- Excellent mechanical properties up to temperatures around 700°C.
- Generally used for parts working within the 600-700°C range.

HEAT TREATMENT

- Solution treatment & Aging:
  955°C / 1 hr / Air cool + 720°C / 8 hrs / furnace cooled 50°C / hr from 720 to 620°C + 620°C / 8 hrs / Air cool.

PHYSICAL PROPERTIES

- Density:
  - at 20°C: 8.2
  - at 400°C: 8.1
  - at 600°C: 7.9

- Mean coefficient of expansion in m/m.°C:
  - between 20°C and 200°C: 13.5×10^{-6}
  - between 20°C and 400°C: 14.2×10^{-6}
  - between 20°C and 600°C: 14.9×10^{-6}

- Modulus of elasticity in N/mm^2:
  - at 20°C: 199×10^3
  - at 200°C: 191×10^3
  - at 400°C: 178×10^3
  - at 600°C: 166×10^3
  - at 800°C: 150×10^3

- Thermal conductivity in $W.m/m^2.°C$:
  - at 20°C: 11
  - at 200°C: 14
  - at 400°C: 17
  - at 600°C: 21
  - at 800°C: 24
  - at 1000°C: 27

- Specific heat in J/g.°C:
  - at 20°C: 0.43
  - at 200°C: 0.48
  - at 400°C: 0.52
  - at 600°C: 0.57
  - at 800°C: 0.62
  - at 1000°C: 0.67

FORGING

- 1150/900°C

Contact:

www.aubertduval.com