

## Nickel-based Alloy

# PER718

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

Temperature in °C	Average load in N/mm <sup>2</sup> 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

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- 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

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- 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:	$13.5 \times 10^{-6}$
- between 20°C and 400°C:	$14.2 \times 10^{-6}$
- between 20°C and 600°C:	$14.9 \times 10^{-6}$

- Modulus of elasticity in N/mm<sup>2</sup>:

- at 20°C:	$199 \times 10^3$
- at 200°C:	$191 \times 10^3$
- at 400°C:	$178 \times 10^3$
- at 600°C:	$166 \times 10^3$
- at 800°C:	$150 \times 10^3$

- Thermal conductivity in W.m/m<sup>2</sup>.°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

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- 1150/900°C

Contact:

[www.aubertduval.com](http://www.aubertduval.com)

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.