

## Nickel-based Alloy

# PER625

NiCr22Mo9Nb

### SPECIFICATIONS

European Standards:

- NiCr22M9Nb

UNS : N06625

### TYPICAL MECHANICAL PROPERTIES

On metal supplied ready for use:

- Tensile test at ambient temperature:

	Grade 1	Grade 2
UTS	850 N/mm <sup>2</sup>	750 N/mm <sup>2</sup>
0.2 % Yield strength	450 N/mm <sup>2</sup>	350 N/mm <sup>2</sup>
Elongation (5d)	40 %	65 %
Impact strength	150 J	250 J

- Rapid tensile test at temperature (Grade 2):

Temperature in °C	UTS in (N/mm <sup>2</sup> )	0.2 % Yield strength in (N/mm <sup>2</sup> )	Elongation (5d) in %
200	730	300	-
400	690	260	-
600	650	250	65
700	550	210	75
800	360	170	85

- Creep (Grade 2):

Temperature in °C	Load in N/mm <sup>2</sup> causing creep fracture in 1000 hrs	Load in N/mm <sup>2</sup> causing creep fracture in 1000 hrs
700	330	245
750	215	155
800	140	100
850	90	65

### COMPOSITION

Carbon.....	<3.00
Chromium.....	22.00
Molybdenum.....	9.00
Iron.....	<5.00
Niobium + Tantalum.....	3.60
Titanium.....	<0.40
Aluminum.....	<0.40
Nickel.....	Base

### APPLICATIONS

- Aerospace industry
- Naval construction
- Offshore
- Chemical engineering
- Cryogenics

### CHARACTERISTICS

Nickel-based superalloy with:

- Very good resistance to oxidation.
- Excellent mechanical properties at high temperatures up to 1100°C.
- Excellent corrosion resistance.
- Good low temperature toughness.

## HEAT TREATMENT

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- Grade 1: Please contact us.
- Grade 2:
  - Solution treatment 1100 / 1200°C.
  - Water cool.

## PHYSICAL PROPERTIES

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- Density:
  - at 20°C: 8.4
  - at 400°C: 8.3
  - at 800°C: 8.2
- Mean coefficient of expansion in m/m.°C:
  - between 20°C and 200°C:  $13.0 \times 10^{-6}$
  - between 20°C and 400°C:  $13.5 \times 10^{-6}$
  - between 20°C and 600°C:  $14.4 \times 10^{-6}$
  - between 20°C and 800°C:  $15.5 \times 10^{-6}$
- Modulus of elasticity in N/mm<sup>2</sup>:
  - at 20°C:  $206 \times 10^3$
  - at 200°C:  $195 \times 10^3$
  - at 400°C:  $184 \times 10^3$
  - at 600°C:  $172 \times 10^3$
  - at 800°C:  $156 \times 10^3$
- Thermal conductivity in W.m/m<sup>2</sup>.°C:
  - at 20°C: 9.7
  - at 200°C: 12.2
  - at 400°C: 15.1
  - at 600°C: 18.1
  - at 800°C: 21.3
  - at 1000°C: 25.1
- specific heat in J/g.°C:
  - at 20°C: 0.38
  - at 200°C: 0.44
  - at 400°C: 0.49
  - at 600°C: 0.53
  - at 800°C: 0.58
  - at 1000°C: 0.63

## FORGING

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- 1180/950°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.