

## Nickel-based Alloy

# PER7H

NiCr18Co15TiMoAl

### SPECIFICATIONS

- NiCr18Co15TiMoAl

### COMPOSITION

Carbon.....	0.07
Chromium.....	18.00
Colbalt.....	15.00
Titanium.....	5.00
Molybdenum.....	3.00
Aluminum.....	2.50
Tungsten.....	1.50
Nickel.....	Base

### TYPICAL MECHANICAL PROPERTIES

On metal supplied ready for use:

- Tensile test at ambient temperature:
  - UTS: 1180 N/mm<sup>2</sup>
  - 0.2 % Yield strength: 910 N/mm<sup>2</sup>
  - Elongation (5d): 7 %
- Rapid tensile test at temperature:

Temperature in °C	UTS in (N/mm <sup>2</sup> )	0.2 % Yield strength in (N/mm <sup>2</sup> )	Elongation (5d) in %
400	1170	850	10
600	1120	850	12
800	910	790	27
1000	350	230	26

- Creep:

Temperature in °C	Average load in N/mm <sup>2</sup> causing creep fracture in 1000 hrs
650	300
700	230
750	170

### APPLICATIONS

- Parts subject to both a hot corrosive environment and to a high level of mechanical stress, such as discs, blades...
- This grade has been predominantly developed in the aerospace industry
- For applications at extremely high temperature it is possible to use other heat treatment conditions to produce significantly different properties (please contact us).

### CHARACTERISTICS

Precipitation hardened, nickel-based superalloy with:

- Excellent resistance to high temperature oxydation
- Good mechanical properties at high temperature

## HEAT TREATMENT

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- Solution treatment & ageing:

1170°C / 4 hrs / Air cool + 1080°C / 4 hrs / Air cool + 845°C / 24 hrs / Air cool + 760°C / 16 hrs / Air cool.

## PHYSICAL PROPERTIES

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- Density:

- at 20°C:	8.10
- at 400°C:	8.00
- at 800°C:	7.80

- Mean coefficient of expansion in m/m.°C:

- between 20°C and 200°C:	$11.0 \times 10^{-6}$
- between 20°C and 400°C:	$13.5 \times 10^{-6}$
- between 20°C and 600°C:	$16.5 \times 10^{-6}$
- between 20°C and 800°C:	$21.5 \times 10^{-6}$

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

- at 20°C:	$214 \times 10^3$
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- Thermal conductivity in W.m/m<sup>2</sup>.°C:

- at 20°C:	11.0
- at 200°C:	13.5
- at 400°C:	16.2
- at 600°C:	19.0
- at 800°C:	21.5
- at 1000°C:	24.5

## FORGING

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- Please contact us

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.