



YOUR FUTURE IN ADDITIVE MANUFACTURING

MATERIAL DATASHEET

Ni-Alloy IN718, 2.4668, B637

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Description

Precipitation hardenable nickel-chromium-alloy with outstanding mechanical properties suitable for the production of highly stressed quality parts. The material has excellent corrosion resistance at very low as well as at high temperatures up to 1,000 °C. Very high tensile, fatigue, creep and fracture strength at low temperatures at 700 °C are characteristic for this alloy. The material is used in the fields of gas turbines, turbochargers, exhaust gas components, aerospace and racing.

Physical Properties

Density [g/cm ³]	8.2 – 8.26
Magnetizability	poor
Thermal conductivity at 20°C [W/m·K]	11.5
Average coefficient of thermal expansion at 20°C [10 ⁻⁶ · K ⁻¹]	14.1
Maximum operating temperature for parts under load	approx. 650 °C
Oxidation resistant up to	approx. 980 °C

Chemical Composition

Element	Min.	Max.
Ni	50.0	55.0
Cr	17.0	21.0
TA + Nb	4.75	5.50
Mo	2.80	3.30
Ti	0.65	1.15
Al	0.20	0.80
Cu	-	0.30
C	-	0.08
Si	-	0.35
Co	-	1.0





Technical Data

Achievable component accuracy

small parts	approx. ± 0.1 mm
large parts	approx. ± 0.2 %

Smallest wall thickness approx. 0.3 - 0.4 mm

Layer thickness 30 - 45 μm

Surface roughness

after the build-up	Rz = 60 $\mu\text{m} \pm 20$ μm
after micro blasting	Rz = 30 $\mu\text{m} \pm 10$ μm
after polishing	Rz < 1 μm

Component density after manufacturing > 99,5 %

Mechanical Properties

	after heat treatment ⁴
Tensile strength [N/mm²]^{1,2}	typ. 1380 \pm 100
Yield point [N/mm²]^{1,2}	typ. 1160 \pm 100
Elongation at break [%]^{1,2}	typ. 14 \pm 3
E-module [GPa]^{1,2}	170 \pm 20
Hardness [HRC]^{1,3}	approx. 47

¹ at room temperature

² mechanical strength according to ISO 6892-1:2009

³ hardness test according to EN ISO 6508-1 on polished surface

⁴ heat treatment according to AMS 5662:

1. solution annealing at 980 °C for 1 hour, air (or argon)-cooling
2. precipitation hardening; keeping at 720 °C for 10 hours, furnace cooling to 620 °C over 2 hours, keeping at 620 °C for 8 hours, air (or argon)-cooling

The stated technical data and material characteristics correspond to our knowledge and experience at the time of publication. These values, determined on our production systems, depend on the powder material, the parameter settings and the component geometry. They therefore do not provide sufficient basis for the component design. These data serve only as guide values. To check the mechanical properties, test specimens can be requested at any time. Only the latest published version of the datasheet is valid.

