CONCEPTLASER
hofmann innovation group

CL 100NB Nickel-based alloy

Nickel-based alloy powder (Inconel 718), chemical composition according to ASTM B 637 UNS 07718

CL 100NB is a nickel-based alloy for the production of components for high-temperature applications.

28
Ni
58,69

Source: MBFZ-toolcraft GmbH

CHEMICAL COMPOSITION

Component	Indicative value (%)
Ni	50,0 – 55,0
Cr	17,0 – 21,0
Nb	4,75 – 5,50
Mo	2,80 – 3,30
Ti	0,65 – 1,15
Al	0,20 – 0,80
Co	0,0 – 1,0
C	0,0 – 0,08
Mn	0,00 – 0,35
Si	0,00 – 0,35
P	0,000 – 0,015
S	0,000 – 0,015
B	0,000 – 0,006
Cu	0 – 0,3

Title photo: www.finamedia.de | Microsections: Concept Laser GmbH
Artwork: www.brandnew-design.de
08/2014 | Subject to technical changes

RANGE OF APPLICATION

Parts for high-temperature applications. Typical applications are turbine construction (aviation or stationary turbines) or exhaust tracts within motor sports applications.

TECHNICAL DATA AFTER RECOMMENDED HEAT TREATMENT

Yield point $R_{p0,2}$ [1]	1000 – 1100 N/mm²
Tensile Strength R_m [1]	1250 – 1350 N/mm²
Elongation A [1]	8 – 12 %
Young's modulus [1]	approx. 200.000 N/mm²
Thermal conductivity λ [2]	approx. 12 W/mK
Coefficient of thermal expansion [2]	approx. 13 · 10^{-6} K^{-1}

[1] Tensile test at 20°C according to DIN EN 50125.
[2] Specification according to the material manufacturer's data sheet.

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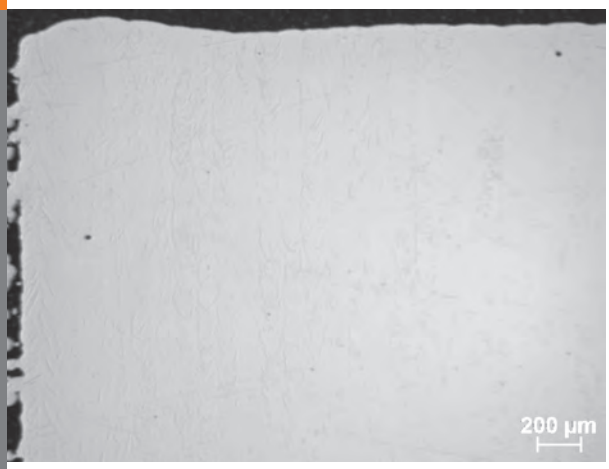
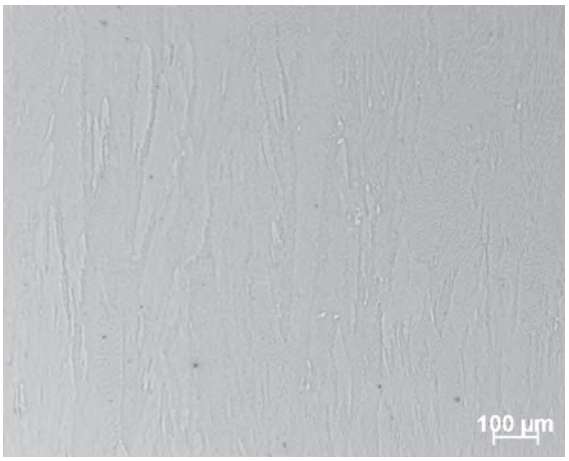
MICROSECTION

Test piece
(x 20 magnification)



Test piece
(x 100 magnification)



HEAT TREATMENT

Perform heat treatment under an argon atmosphere in two steps:
At first solution annealing (980°C for one hour), afterwards allow the components to cool in the oven.
In the second step aging (720°C for 8 hours).
After this procedure allow the component to cool down to 620°C within two hours. Afterwards maintain this temperature for further 8 hours.

MICROSTRUCTURE

Components made from nickel-based alloy CL 100NB display a homogeneous, dense structure after they are manufactured by means of the metal laser melting process LaserCUSING®.

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