

# CONCEPTLASER

a GE Additive company

## CL 100NB Nickel-based alloy

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

With an appropriate approval\* CL 100NB can be used for production  
of components for high-temperature applications.

28  
**Ni**  
58,69

### 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
Fe	Balance

## RANGE OF APPLICATION

With an appropriate approval\* CL 100 NB can be used for production of 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

	90° (horizontal)	45° (polar angle)	0° (upright)
Yield Strength $R_{p0,2}^1$	$1007 \pm 11 \text{ N/mm}^2$	$1047 \pm 8 \text{ N/mm}^2$	$951 \pm 7 \text{ N/mm}^2$
Tensile Strength $R_m^1$	$1340 \pm 12 \text{ N/mm}^2$	$1351 \pm 21 \text{ N/mm}^2$	$1283 \pm 20 \text{ N/mm}^2$
Elongation $A^1$	$16 \pm 1 \%$	$17 \pm 2 \%$	$15 \pm 4 \%$
Young's Modulus $E^1$	approx. 200 MPa	approx. 200 MPa	approx. 200 MPa
Thermal Conductivity $\lambda^2$	approx. 12 W/mK	approx. 12 W/mK	approx. 12 W/mK
Coefficient of thermal Expansion (at rt) $\alpha^2$	approx. $13 \cdot 10^{-6} \text{ K}^{-1}$	approx. $13 \cdot 10^{-6} \text{ K}^{-1}$	approx. $13 \cdot 10^{-6} \text{ K}^{-1}$
<sup>1</sup> Tensile test at 20°C according to DIN EN 50125 <sup>2</sup> Specification according to the material manufacturer's data sheet.			

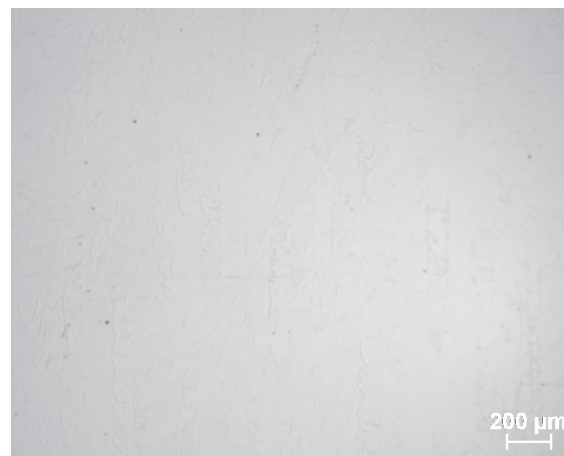
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## MICROSECTION

Test piece  
(x 20 magnification)



Test piece  
(x 20 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®.

All of the specified figures are approximate figures. The figures which are provided reflect the current level of our knowledge and are dependent on process and machine parameters. The information provided on this material data sheet is therefore not binding and is not deemed to be certified.  
 \* The approval is branch-specific and/or application-specific and it must be, therefore, carried out by the consumer/user. Approval of materials by Concept Laser GmbH is not available.

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