

L-PBF PROCESS

Layer thickness	30 µm
Laser power	200 W
Theoretical build-up rate	5,4 cm ³ /h

POWDER MATERIAL

M300 or 1.2709 is an age hardenable martensitic tool steel with exceptional mechanical properties such as high tensile strength and good hardness. Typical high carbon steels for molding or tooling applications are very hard to process by means of LPBF. M300 is easily processable and achieves comparable mechanical properties. After heat treatment yield strength above 2000 MPa and hardness up to 54 HRC can be achieved.

PHYSICAL PROPERTIES

Particle Size	15 µm – 45 µm
Density	8,1 g/cm ³
Thermal conductivity	14-22 W/mK
Melting range	1430 °C – 1450 °C
Thermal expansion	10,4 x 10 ⁻⁶ K ⁻¹

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 Sparkasse Aachen
 IBAN: DE66 3905 0000 1070 1746 91 | BIC: AACSD33XXX

US-Dollar Account: 107877301 | Routing: 39070024
 Deutsche Bank PGK Aachen
 IBAN: DE36 3907 0024 0107 8773 01 | BIC: DEUTDE33

CHEMICAL COMPOSITION

Element -	Mass fraction
Fe	Balance
Ni	17-19,0%
Co	8,5-10,0%
Mo	4,5-5,20%
Ti	0,8-1,20%
Cr	<0,25%
Mn	<0,15%
N	<0,10%
O	<0,10%
Si	<0,10%
C	<0,03%
P	<0,010%
S	<0,010%

MECHANICAL DATA

		As Built	Heat Treated
Tensile Strength	R_m	1262 MPa	2186 MPa
Yield strength	R_{p0,2}	1055 MPa	2117 MPa
Elongation at break	A	15%	6%
Rockwell hardness		29 HRC	54 HRC

All values are subject to natural volatilities depending on applied powder material, process parameters and surrounding conditions.

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