

UniFuse™ IN625 60µm 400W Performance

· Laser Powder Bed Fusion 3D printing,

Chemical Composition:

Element [wt.-%]	Ni	Al	C	Cr	Fe	Mn	Mo	Nb	P	Si	S	Ti	Co
Min	58.0	0	0	20.0	0	0	8.0	3.15	0	0	0	0	0
Max	Bal.	0.4	0.1	23.0	5.0	0.5	10.0	4.15	0.015	0.5	0.015	0.4	1.0

Power Properties:

Density (g/cm³)

Tap Density (Typical)	6.2 g/cm ³
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Typical properties at nominal density and nominal composition:

Coupon Type: ASTM E8 – 21

As-built mechanical properties

Material properties	Symbol	As-built ⁽¹⁾
Density [g/cm ³] ⁽²⁾⁽⁷⁾	ρ	8.4
Density [%] ⁽²⁾	%	99.98
Porosity [%] ⁽²⁾	P	0.02
Ultimate Tensile Strength [MPa] ^{(3) (4)}	R _{m xy} -bar	1039 ± 9
	R _{m z} -bar	948 ± 8
Yield Strength [MPa] ^{(3) (4)}	R _{p0.2xy} -bar	695 ± 26
	R _{p0.2z} -bar	585 ± 11
Fracture Elongation [%] ^{(3) (4)}	A _{xy} -bar	40 ± 6
	A _z -bar	47 ± 4
Surface roughness in z-direction, no treatment [µm] ⁽⁵⁾⁽⁶⁾	R _a	8.5 ± 1.2

Remarks:

1) Properties are given for the laser melted product printed at 60µm layer thickness. Auxiliary operations, e.g., heat treatments, surface modifications, coating processes, bead blasting, etc. may influence the displayed properties. Error values provided with a +/- are given to one standard deviation for printing within machine and environmental specifications.

2) The indicated density limits are valid for the mean density of a component. For complex and geometrically unfavorable shapes the local segment density can deviate from these limits and therefore materials properties may be affected.

3) Materials properties stated in the tables above have been determined on the basis of ASTM E8-21.

4) Mechanical characteristics are typical mean values valid for the indicated nominal density level, and will vary from printer to printer.

5) Roughness measurement in accordance with DIN EN ISO 4287.

6) Surface roughness values are dependent on the gas flow characteristics of the machine.

7) The density of the material is dependent on the range of possible chemical compositions.