



YOUR FUTURE IN ADDITIVE MANUFACTURING

MATERIAL DATASHEET

X 2 CrNiMo 17 13, 316L, 1.4404, ASTM F138

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Description

Austenitic stainless steel for the production of functional components in numerous industries.

Good corrosion resistance, good acid resistance and good polishability characterize this material. It is used in the automotive and medical industry, for functional parts, prototype and serial parts and jewellery and lifestyle sectors.

Use in the temperature range from 427 °C to 816 °C should be avoided, as precipitation of chromium carbides occurs here. Due to the layered structure, the components are subject to a certain anisotropy, which is reflected in the mechanical properties. In order to specifically influence the mechanical properties of 1.4404, the steel is solution annealed at 1020 °C to 1120 °C with subsequent cooling in water or air. The elongation at fracture can thus be increased.

Physical Properties

Density [g/cm ³]	7.98
Electr. resistance at 20 °C [Ω ·mm ² /m]	0.75
Magnetizability	low
Thermal conductivity at 20 °C [W/m·K]	15
Spec. heat capacity at 20 °C [J/kg · K]	500
Average coefficient of thermal expansion at 20 °C [10^{-6} · K ⁻¹]	16.0

Chemical Composition

Element	Min.	Max.
Fe	Balance	Balance
Cr	16.5	18.5
Ni	10.0	13.0
Mo	2.0	2.5
Mn	-	2.0
Si	-	1.0
P	-	0.045
C	-	0.030
S	-	0.030



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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
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Layer thickness	30 - 45 μm
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Surface roughness

after the build-up	Rz = 80 $\mu\text{m} \pm 20$ μm
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after micro blasting	Rz = 30 $\mu\text{m} \pm 10$ μm
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after polishing	Rz < 1 μm
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Component density after manufacturing	> 99.5 %
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Mechanical Properties

	after heat treatment ⁴
Tensile strength [N/mm²]^{1,2}	typ. 570 ± 30
Yield point [N/mm²]^{1,2}	typ. 310 ± 30
Elongation at break [%]^{1,2}	> 20
E-module [GPa]^{1,2}	185 ± 10
Hardness [HBW 2,5/187,5]^{1,3}	145 ± 10

¹ at room temperature

² tensile test according to DIN EN 50125

³ hardness test according to DIN EN ISO 6506-1

⁴ stress relief heat treatment at 1050 °C maintained for 2 h

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.

