MATERIAL DATASHEET

X 3 NiCoMoTi 18 9 5, 1.2709, 18% Ni Maraging 300

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Description

1.2709 is a martensitic-hardening tool steel with excellent elastic and yield points, which is particularly suitable for the manufacturing of tool inserts and molds with near-contour cooling. Very high toughness and yield point can be achieved with low distortion by simple heat treatment. Furthermore, 1.2709 is hardenable up to 54 HRC, is polishable and machinable and exhibits good thermal conductivity. The material is used in toolmaking, inserts for die and injection molds, prototyping, serial parts, spare parts, customized products and high-performance components with a particularly high strength and/or hardness in aerospace and automotive.

Physical Properties

Density [g/cm³]	8.0 – 8.05
Magnetizability	good
Electr. resistance at 20 °C [Ω·mm²/m]	approx. 1
Thermal conductivity 20 °C [W/m·K]	20 ± 1
Spec. Thermal capacity at 20 °C [J/kg · K]	450 ± 20
Average coefficient of thermal expansion at 20 °C [10-6 · K-1]	10.3
Permanent operational stability up to [°C]	approx. 400

Chemical Composition

Element	**Min.**	**Max.**
Fe	Balance	Balance
Ni	17.0	19.0
Co	8.50	10.0
Mo	4.50	5.20
Ti	0.80	1.20
C	-	0.03
Si	-	0.10
Mn	-	0.15
P	-	0.010
S	-	0.010
Cr	-	0.25

Technical Data

Achievable component accuracy	
small parts	approx. ± 0,1 mm
large parts	approx. ± 0,2 mm
Smallest wall thickness	approx. 0.4 – 0.5 mm
Layer thickness	30 - 45 µm
Surface roughness	
after the build-up	Rz = 60µm ± 20 µm
after micro blasting	Rz = 30µm ± 10 µm
after polishing	Rz < 1 µm
Component density after manufacturing	> 99,5 %

Mechanical Properties

	Nach Wärmebehandlung[4]
Tensile strength [N/mm²][1,2]	1950 ± 100
Yield point [N/mm²][1,2]	1900 ± 100
Elongation at break [%][1,2]	2 ± 1
E-module [kN/mm²][1,2]	180 ± 20
Hardness [HRC] [1,3]	50 - 54

[1] at room temperature
[2] tensile test according to DIN EN 50125
[3] hardness test according to DIN EN ISO 6508-1
[4] solution annealing at 820 °C to 850 °C with subsequent cooling in water. Followed by heat outsourcing at 490 °C over a period of 6 hours. The cooling rate is 2 °C/min. From 200 °C, cooling is uncontrolled.

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.