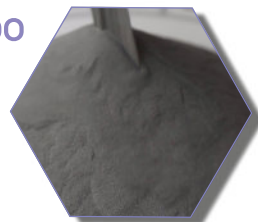


Material Data Sheet - Maraging MS1 / 1.2709 / 18Ni300



This document provides information and data for parts built using maraging MS1 powder with specific properties (given in the table 'Physical and chemical properties of powder').

Description

The maraging MS1 is a steel with good mechanical properties, especially excellent strength and hardness. It is an appropriated material for industrial tooling.

Mechanical Properties

Mechanical properties of as-build parts (tested at 20°C)

Technical data :

Physical and chemical properties of powder (according to NF EN 10088-1, arranged Ti-free)

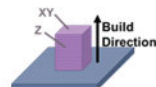
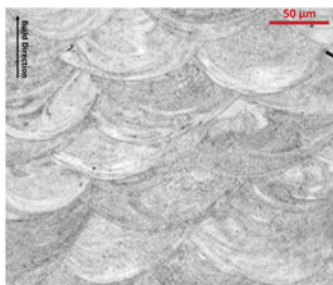
Materials composition (%weight)	Elements	Minimum	Maximum
		Balance	
	Fe		
	Cr	17	19
	Ni	8.5	9.5
	Co	4.5	5.2
	Mo	0.05	0.15
	Al	0.0	0.3
	Cr	0.0	0.1
	Ti	0.0	0.1
	Si	0.0	0.1
	Mn	0.0	0.1
	C	0.0	0.03
	S	0.0	0.01
	P	0.0	0.01
Tap density (g/cc)*		Between 4.7 and 4.98	
Particle size (µm)*		+3 / -16	

* Data certified by powder provider of AddUp

		Thin Samples #	Bulk Samples #
Ultimate tensile strength	(XY) direction	1021 ± 15 MPa	1122 ± 2 MPa
	(Z) direction	987 ± 11 MPa	1110 ± 5 MPa
Yield strength, Rp0.2%	(XY) direction	952 ± 8 MPa	1022 ± 2 MPa
	(Z) direction	933 ± 3 MPa	1037 ± 7 MPa
Elongation at break	(XY) direction	3.6 ± 3 %	9.8 ± 0.8 MPa
	(Z) direction	3.8 ± 15 %	8.8 ± 0.8 MPa
Young's Modulus		160 ± 1 GPa	/
Micro Hardness (Hv1000)		HV 374 ± 2 (HRC 38.1 - 0.2)	HV 372 ± 12 (HRC 38 - 1.2)

Results of Thin Samples are obtained with very thin samples of thickness 0.4 mm. Results of Bulk Samples are obtained with normalized samples tested according to the standard NF EN 2002-001.

Microstructure



Microstructure obtained by SLM (after etching)

The microstructure obtained during SLM with maraging is composed of martensitic α -phase. The picture shows the regular structure of melting tracks.

Observation by Scanning Electron Microscopy of powder

