

DIRECT METAL LASER SINTERING

MARAGING STEEL 1.2709 PRODUCT SPECIFICATIONS

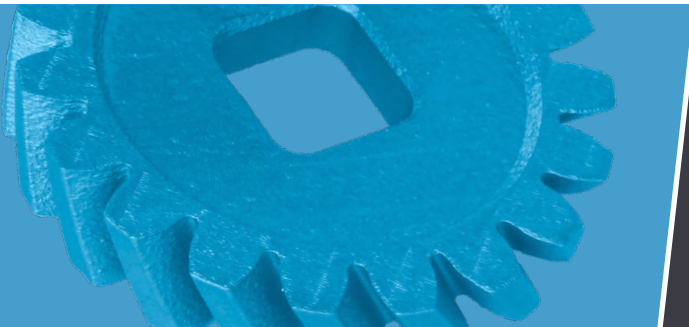


PRODUCT DESCRIPTION:

Maraging Steel 1.2709 is a pre-alloyed ultra high strength steel in fine powder form. Its composition corresponds to US classification 18% Ni Maraging 300, European 1.2709 and German X3NiCoMoTi 18-9-5. This kind of steel is characterized by having very good mechanical properties, and being easily heat-treatable using a simple thermal age-hardening process to obtain.

APPLICATIONS:

This material is ideal for tooling applications and for high performance industrial and engineering parts, for example in aerospace and motor racing applications.



KEY PRODUCT BENEFITS

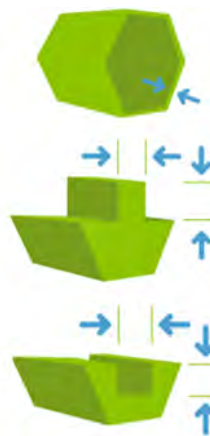
- High strength
- High hardness
- Good High-temperature resistance

CHEMICAL COMPOSITION:

According 1.2709 and DIN X3NiCoMoTi 18-9-5

Fe (bal)
Ni (17 - 19 wt-%)
Co (8.5 - 9.5 wt-%)
Mo (4.5 - 5.2 wt-%)
Ti (0.6 - 0.8 wt-%)
Al (0.05 - 0.15 wt-%)
Cr (\leq 0.5 wt-%)
C (\leq 0.03 wt-%)
Mn, Si (each \leq 0.1 wt-%)
P, S (each \leq 0.01 wt-%)

GEOMETRICAL LIMITS:



Min Wall thickness 1.00 mm - Min. Feature Size 1,00 mm

Min. embossed details 0.5mm high and wide and 0.8mm for readable text and clear images

Min. engraved details 0.5mm deep and 0.6mm wide; 1.0mm wide for readable text and clear images

PROPERTIES:

Heat Treatment	Tensile Strength MPa	Yield Strength 0,2% MPa	Elongation %	Hardness HRC	Density
/	1100 MPa +/- 100 MPa	1000 MPa +/- 100 MPa	8% +/- 3%	ca. 33 -37 HRC	>99,95%
Heat Treatment	Tensile Strength MPa	Yield Strength 0,2% MPa	Elongation %	Hardness HRC	Density
age hardened	1950 MPa +/- 100 MPa	1900 MPa +/- 100 MPa	2% +/- 1%	ca. 50-54 HRC	>99,95%

RESOLUTION:

	Layer Thickness	Build Envelope	Min. Feature Size
High Resolution	0,04 mm	245x245x300mm	1,00mm
Normal Resolution	0,06 mm	245x245x300mm	1,00mm

SURFACE:

	0 °	45 ° bottom	45 ° top	90 °
High Resolution	Ra 6 µm Rz 35 µm	Ra 7,5 µm Rz 37 µm	Ra 6,5 µm Rz 33 µm	Ra 3,8 µm Rz 20 µm
Normal Resolution	Ra 6,5 µm Rz 35 µm	Ra 10 µm Rz 50 µm	Ra 6,5 µm Rz 33 µm	Ra 4 µm Rz 25,3 µm



High Resolution 40 µm



Normal Resolution 60 µm

STANDARD TOLERANCES:

Typically, for well-designed parts, with a designated build direction, tolerances of +/- 0.1 mm to +/- 0.2 mm + 0.005 mm/mm are expected and achieved.

Certain geometries may cause distortions due to internal stress which may lead to higher deviations.