

Material Data Sheet - Maraging steel 1.2709 (MS1)

Material Description

Maraging steel 1.2709 from Airbus APWorks, a martensite hardenable steel, has a chemical composition corresponding to US classification 18% Ni maraging 300, European 1.2709 and German X3NiCoMoTi 18-9-5. This steel is characterised by having excellent strength combined with high toughness, very good mechanical properties, and being easily heat treatable using a simple thermal age hardening process to obtain excellent hardness and strength. Airbus APWorks' maraging steel 1.2709 is easily machinable after the building process, and can be easily post hardened to more than 50 HRC by age hardening at 490°C (914°F) for six hours. Parts in both states of built and age hardened, can be machined, spark eroded, welded, micro shot peened, polished, and/or coated if required. The layer wise building method gives the parts a certain anisotropy, which can be reduced or removed by using appropriate heat treatment methods.

General Properties

Properties	Values
Density (g/cm ³)	8.0
Typical tolerance (µm)	± 30
Smallest wall thickness (mm)	1.0
Surface roughness, as built (µm) *	Ra 5 / Rz 28 *

Mechanical Properties

Properties	Values
Young's Modulus (GPa)	130
Yield Strength (MPa)	900
Ultimate Tensile Strength (MPa)	1000
Elongation at Break (%)	6
Hardness (HRC5)	33

Values stated in the datasheet refer to the minimum properties that are reached using Additive Layer Manufacturing in the least strong direction of the material.

The values of the mechanical properties are generated from tests conducted at room temperature, according to DIN EN 2002-001 standards, from specimens that have been machined.

* The surface roughness values depend on the measurement method used and the orientation of the surface. The values quoted here give an indication of what can be achieved for certain surfaces.