

3D Metal – Maraging Steel Material Information

Working with MS1. Some high lights are: up to 56HRC and 1,000,000 cycles.

Tooling Work Info Maraging Steel (MS1)	
Action	Technical Information
Annealing	Maraging 300 alloy steel can be annealed at 1038°C (1900°F) after cold working and then finally cooled in air.
Cold Working	Maraging 300 alloy steel can be cold worked by conventional methods.
Welding	Maraging 300 alloy steel can be welded by conventional methods.
Forging	Maraging 300 alloy steel can be forged as for stainless 304 alloy.
Forming	Conventional methods are used to readily form maraging 300 alloy steel that has good ductility.
Machinability	Maraging 300 alloy steel has good machinability characteristics. Consistent with traditional tool steels.
Heat Treatment	Maraging 300 alloy steel cannot be heat treated for hardening except by aging.
Hot Working	Maraging 300 alloy steel can be hot worked in temperatures ranging 260 to 93°C (500 to 200°F). Age hardening takes place when this alloy steel is exposed to these temperatures for a long time.
Hardening	Maraging 300 alloy steel can be hardened by aging and cold working. *34-36HRC (as grown), Up to 54-56HRC after heat treat.
Aging	Maraging 300 alloy steel has high hardness and strength properties and is thus suitable for an aging heat treatment at 482°C (900°F). *Age hardening shrink is approximately 0.08%.
Surfaces	Can be coated, polished, grained etc.
Tooling Cycles	Typically lasts 1,000,000 cycles. (application dependent) *(ROI for inserts is typically 90days)
Applications	Industries Include: Tooling, Low & High Volume Parts, Die Casting, Tooling Inserts, Gauges & Fixtures, Gears, Dental Components, Surgical Implants, Aerospace, and much more

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Printed parts and inserts typically take 3-7 business days depending on complexity.

Other Technical Data	
Typical Achievable Part Accuracy	
Small Parts (<80mm x 80mm)	approx. $\pm 20 \mu\text{m}$ approx. $\pm 0.8 \times 10^{-3}$ inch
Large Parts	approx. $\pm 50 \mu\text{m}$ approx. ± 0.002 inch
Age hardening shrinkage	approx 0.08%
Minimum wall thickness	approx. 0.3 - 0.4 mm approx. 0.012 - 0.016 inch
Surface Roughness (approx) (as manufactured)	
MS1 Surface (20 μm)	Ra 4 μm ; Rz 20 μm Ra 0.16×10^{-3} inch, Rz 0.78×10^{-3} inch
MS1 Surface (40 μm)	Ra 5 μm ; Rz 28 μm Ra 0.19×10^{-3} inch, Rz 1.10×10^{-3} inch
MS1 Surface (50 μm)	Ra 9 μm ; Rz 50 μm Ra 0.47×10^{-3} inch, Rz 2.36×10^{-3} inch
After Shot Peening	Ra 4 - 6.5 μm ; Rz 20 - 50 μm Ra $0.16 - 0.26 \times 10^{-3}$ inch Rz $0.78 - 1.97 \times 10^{-3}$ inch
After Polishing	Rz up to < 0.5 μm Rz up to < 0.02×10^{-3} inch (can be very finely polished)