

## DMLS Material

### Direct Metal Laser Sintering (DMLS)

We can convert your CAD files into 3D objects, dimensionally accurate very fast, using Direct Metal Laser Sintering (DMLS). Maraging Steel MS1 models can be built up to 10" x 10" x 8" (250mm x 250mm x 200mm). Parts can be machined, micro-blasted, polished, and coated.

Accuracy is  $\pm 0.00492$ " for the first 0.98425 inches (0.125mm – 25mm) and  $\pm 0.00197$  - 0.98425" inch per inch (0.05mm – 25mm) thereafter.

### Process Direct Metal Laser Sintering

<b>Product:</b>	Maraging Steel MS1
<b>Recommended minimum layer thickness:</b>	40 $\mu$ m 1.6 mil
<b>Smallest wall thickness:</b>	0.3-0.4 mm 8-20 mil
<b>Surface roughness - After shot-peening:</b>	Ra4-6.5 $\mu$ m:Ry20-50 $\mu$ m Ra0.16-0.25;Rz0.78-1.95mil
<b>Surface roughness - After polishing:</b>	Rz up to <0.5 $\mu$ m Rz up to <0.02 mil (can be very finely polished)
<b>Yield Point (Rp 0.2 %):</b>	1000MPa $\pm$ 100 MPa - 14 ksi $\pm$ 15 ksi
<b>Elongation at break as built:</b>	8% $\pm$ 3%
<b>Hardness as built:</b>	33-37 HRC
<b>Young's modulus :</b>	180Gpa $\pm$ 20GPa 26.5 msi $\pm$ 3 msi
<b>Applications:</b>	High-performance industrial and engineering parts, for aerospace and motor racing applications.

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

Disclaimer: All tolerance specifications reflect the approximate range of a process's capabilities and should be viewed only as a guide. Actual capabilities are dependent upon manufacturing, equipment, material, and part requirements.