

DIRECT METAL LASER SINTERING (DMLS/DMP)

What Is Direct Metal Laser Sintering (DMLS)

DMLS or DMP is the most well-known metal 3D printing technology. It uses a laser for sintering very thin layers of metal powder to create a 3D metal object. It is used to produce very complex geometries in great detail which is a clear advantage compared to the conventional manufacturing methods.

The 3D printed part has excellent mechanical properties as its isotropic, and they tend to have higher strength and degree of hardness compared to the parts made by traditional manufacturing techniques.

It builds the metal parts from a CAD file using a laser selectively fuse a fine metal powder. DMLS provides a fast way to produce metals such as aluminium, stainless steel, titanium strong end-use parts.

How Does DMLS Works?

The DMLS machine begins sintering each layer-first the support structures to the base plate, then the part itself, with a laser aimed onto a bed of metallic powder.

After a cross-section layer or powder is micro-welded, the build plate shifts down and a recoater blade moves across the platform to deposit the next layer of powder into an inert build chamber.

The process is repeated layer by layer until the part is complete.

Common DMLS Applications

- Aerospace
- Automotive
- Medical
- Jewellery
- Dental
- Chemistry

Design Requirements

Minimum wall thickness	0.5 mm
Minimum hole diameter	1.0 mm
Minimum feature size	2.0 mm
Minimum printable font size	6 pt
Threads	CNC recommended after 3d printing
Minimum assemble gap	0.15 mm/side

Available materials for DMLS/DMP 3D Printing

DMLS produces parts from a very wide range of engineering thermoplastics. Here is a list of the DMLS materials available on 3Dtechnologies4U.

Materials	Applications
Aluminium-ALSi10Mg	General purpose applications, aerospace, automotive, transportation, consumer products, applications in demand of good thermal properties
Stainless Steel 316L	Consumer, automotive, industrial, aerospace (turbine industry)
Titanium, Ti64 Grade 5	General purpose applications, medical, aerospace, transportation, application in demand of good mechanical properties
Maraging Steel 18Ni300	Consumer, automotive, industrial applications, non-corroding material for food industry
Inconel 718	Functional, end-use parts, military, transportation, cases, adaptors, holders
Stainless Steel 17-4PH	Consumer, automotive, industrial applications, non-corroding material for food industry