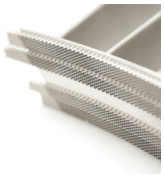


- The DMLS process offers unique design and component geometry possibilities

- Conformally cooled tooling inserts for plastic moulding and die casting

- Many applications in sculpture and jewelry manufacture

- DMLS is ideal for small volume complex metal parts

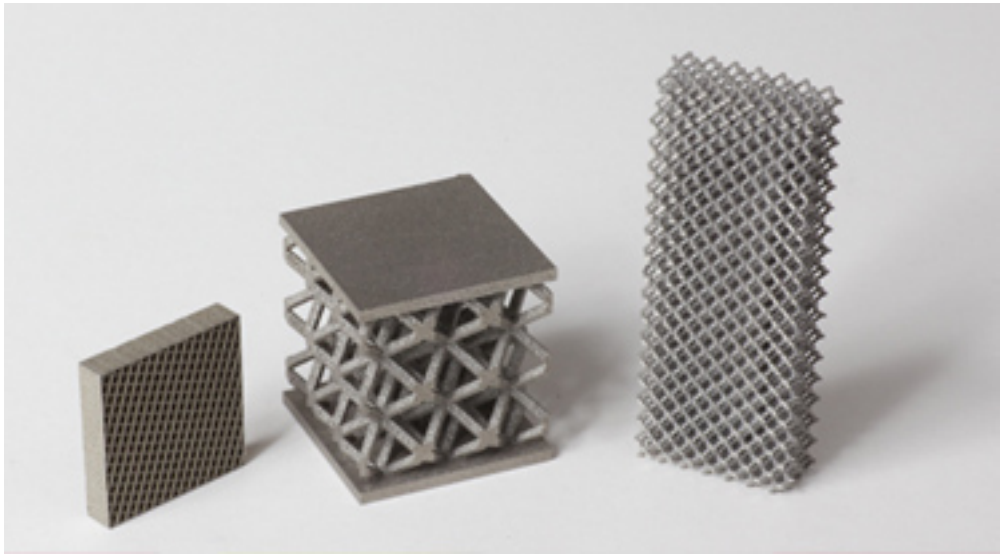
- Design changes can be made with minimal cost implications between batches/builds

- Materials include hardenable Maraging Tool Steel, Stainless Steels and Cobalt Chrome Alloy

- Very efficient material processing - only part mass of material is used

- Full production service combining DMLS and advanced machining capabilities at CRDM

Rapid Manufacture of Complex Metal Parts



The **DMLS** (**Direct Metal Laser Sintering**) additive layer manufacturing (ALM) process produces metal components direct from a CAD model using a powerful 200w Yb-fibre laser to sinter or melt layers of fine metal powder together.

A CAD model is sliced into layers as thin as 0.02mm and then reconstructed layer by layer with the laser fusing or melting each layer to the one below. In this way the system can build any geometry, unlike a ‘line-of-sight’ material removal process such as CNC machining , which would require the support of EDM to achieve certain shapes.

The process also allows complex thin walled (in some cases down to 0.2mm) metal structures to be produced, allowing structures that could not be built any other way.

Consequently, very complicated or involved geometries can be obtained, including internal voids, tunnels and undercuts as the ‘unsintered’ powder is literally shaken out and reused. Applications of this include novel heat exchanger designs and components that require sensor

or cable channels to smoothly carry cable (particularly fibre optic cable) through complex path ways.

This makes the process very material efficient, as only the mass of part is used in raw material (plus a small amount for support structures if required). This is very advantageous when using expensive high performance alloys and rare metals, traditional processess can produce upto 90% swarf material which must be bought up front and then reclaimed and recyled.

For more material information please see DMLS technical information

Typical applications:

Automotive, Aerospace & MOD

- Engineering applications including functional prototypes, small series products, individualised products or spare parts. High performance bespoke components to solve unique problems.

- Parts requiring particularly high toughness and ductility, e.g. turbines and other parts for engines, cutting parts, etc. parts having very small features such as thin walls, pins, etc.

Medical Implants & Dentistry

- Parts requiring high corrosion resistance, sterilisability, etc.

- Prototype or one-off biomedical implants, e.g. **spinal**, knee, hip bone, toe and dental parts.

- Parts requiring high mechanical properties in elevated temperatures (500-1000°C).

- Medical Implants

- Medical Tooling

- Production Components

- Ergonomic Models

- Working Prototypes

- Wind Tunnel Testing

- Exhibition Models

- Design Proving

- Accurate to +/-50 microns

- Delivery 5-10 days