PMS Diecasting Ltd

'Direct Metal Laser Sintering'

Direct metal laser sintering (DMLS) is a revolutionary technology that is beginning to gain recognition for tooling applications. This European technology has enabled PMS Diecasting to dramatically reduce their time-to-market for rapid tooling and direct metal applications from accessing this technology at the Innovative Metals Processing Centre based at the Advanced Manufacturing Research Park (AMRC).

DMLS is an additive technology that works by sintering very fine layers (20 microns) of metal powders layer-by-layer from the bottom up until the build is complete. The process begins by sintering a first layer of 20-micron powder onto a steel platform. The platform then lowers by 20 microns, a fresh layer of powder is deposited over the previously sintered layer, and the next layer is sintered on top of the previously built one. Once started, the machine builds unattended, 24 hours a day. Parts and inserts that come out of the machine typically will go through a series of post steps including wire erosion, and specialist polishing. The parts coming out of the machine are exactly representative of the 3D-CAD model - there is no operator error which can produce inaccurate parts.

PMS Diecasting has found the advantages of using the DMLS process over more traditional methods, include:

- The ability to create multiple parts at the same time in one build
- Operation of the machine unattended 24 hours a day
- Ability to create internal sharp corners and other complex geometry that otherwise would need to have an EDM operation
- The ability to create conformal cooling channels in the tool

Direct metal laser sintering is quickly gaining recognition as perhaps one of the most enhancing technologies available in the additive fabrication arena today. Recent material developments coupled with phenomenal detail resolution and speed of fabrication are making DMLS inserts and components a very powerful tool that can be used to shorten tooling leadtimes, reduce costs and push more projects through in the same amount of time. Recent machine enhancements coupled with tremendous advancements in new materials have allowed DMLS to be a technology to consider not just for rapid tooling requirements, but also for production tools and non-traditional applications such as die cast tools.

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