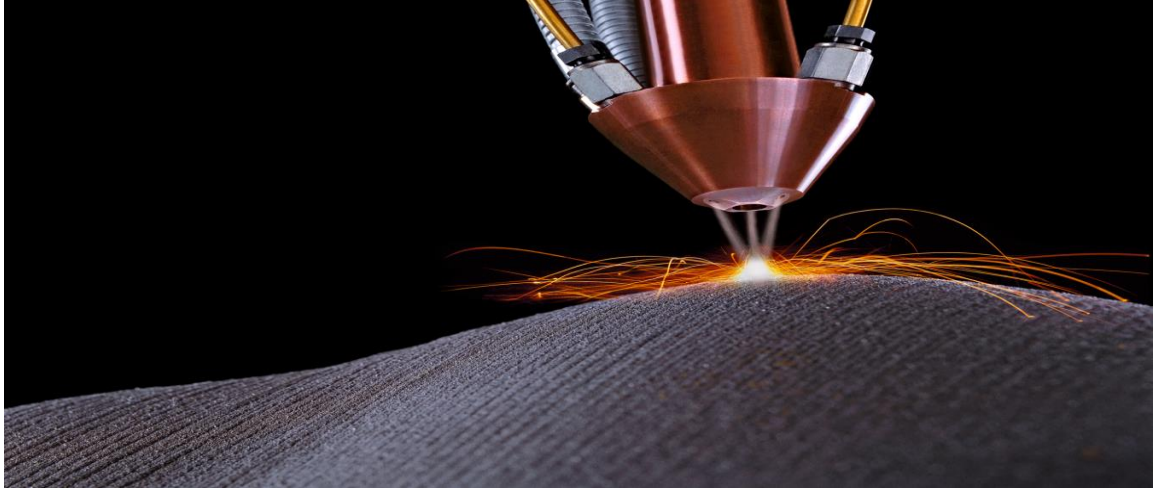


OpenLMD – making LMD hybrid manufacturing easy



Courtesy of TRUMPF

The capability to add material to existing workpieces or blank parts opens up new applications and allows re-thinking delivery chains. Mass-customisation at a late stage in the process chain has big potential in terms of optimising the manufacturing process and paves the way to quickly realise customer requirements.

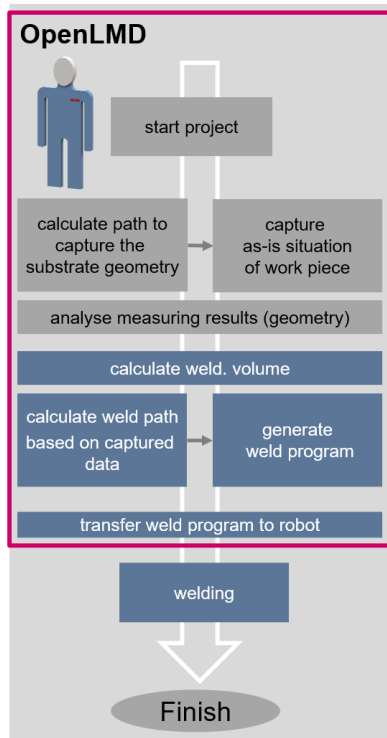
Laser Metal Deposition (LMD) is suitable for new part manufacturing and is of special interest for repair applications offering processing parts with nearly unlimited size. In the latter case, the geometry of the base part is captured in first processing step.

The LMD process generates geometries by injecting material in form of powder into a laser hot spot while moving this spot along the desired shape.

To support a process flow consisting of geometry capturing, calculations and LMD processing as good as possible, BCT's software OpenLMD integrates the components listed below into one software system:

- welding nozzle for material deposition (per LMD)
- NC machine or robot to move the nozzle around the part
- Sensors to capture the geometry of the substrate (base geometry) and to capture intermediate stages of the build process.
- Path generation for LMD nozzle
- Process flow definition

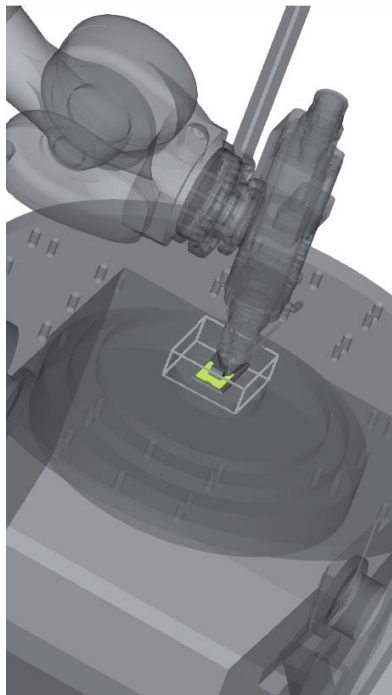
BCT.



OpenLMD is the link between the above-mentioned components required to join them to an industrial proof system for adding material to existing base parts by LMD.

A typical processing route is as follows:

1. Capture as-is situation
To define the capturing process, single points representing the measuring path are set on the CAD model, or by entering their coordinates.
2. Measuring of the part by laser line scanner
3. Import of the geometry to be build (normally defined by CAD, outside OpenLMD)
4. Calculation of the “missing”-volume to be built to get the desired geometry by comparing the as-is situation with the target geometry.
5. Path generation for actual LMD process, OpenLMD
6. Execution of entire process including geometry capturing, calculation and LMD processing, controlled by OpenLMD



OpenLMD supports the user during the process set-up. All processing steps can be followed/edited easily via the user interface. Movements of the equipment can be simulated (geometrically) previous their execution.

In terms of suitable technological parameters, we are working in close cooperation with well-known partners, having a dedicated expertise in this field of application.

See the system in action:



LMD in action (source ProLMD project)

BCT.

BCT Steuerungs- und DV- Systeme GmbH • Carlo-Schmid-Allee 3 • 44263 Dortmund / Germany
Tel.: +49-(0)231-97 50 10 0 • Telefax: +49-(0)231-97 50 10 99 • info@bct-online.de • www.bct-online.de