

HIcoat® LMD – Laser Metal Deposition

It is our aim at Sulzer to continuously provide faster and better repair solutions. Laser metal deposition (LMD) is yet another technique in Sulzer's portfolio to accomplish this.

LMD uses a laser as its source of heat. The control and concentration of heat from a laser source allows for a much lower heat input into a substrate. Despite this low heat input, the process produces a metallurgical bond and a fully dense coating just like you would see with other welding processes. The lower heat input also contributes to low dilution, smaller heat affected zones, and minimal to no distortion.

The applications where LMD can be offered are endless as the range of materials and part geometries that LMD is capable of working with are very broad. All these advantages come with reduced processing times when compared to traditional welding processes, while also providing solutions beyond full component replacement when weld repair is not an option.



Overlay options

- Hardfacing
- Corrosion resistance
- Dimensional restoration

Other nomenclature

- Laser cladding
- DLD (Direct laser deposition)
- DMD (Direct metal deposition)
- DED (Direct energy deposition)
- Laser hard facing
- Laser hard bonding

Advantages over existing methods

- Metallurgical bond
- High bond strength
- Less heat input
- Minimal heat affected zone
- Minimal distortion
- Low dilution
- Capabilities of repairing more complex geometries

Repair applications

- Bearing journals
- Hydraulic coupling fits
- Deeply worn seal areas
- Steam turbine leading edges
- Impeller vane tips
- Small diameter shaft fits



Sulzer's offered solutions

Laser metal deposition can be utilized in a wide variety of repair options. Some of these options include wear restoration with tungsten carbide and stellite hardfacings, dimensional restoration with stainless, and corrosion protection with Inconel 625.

Shaft repairs

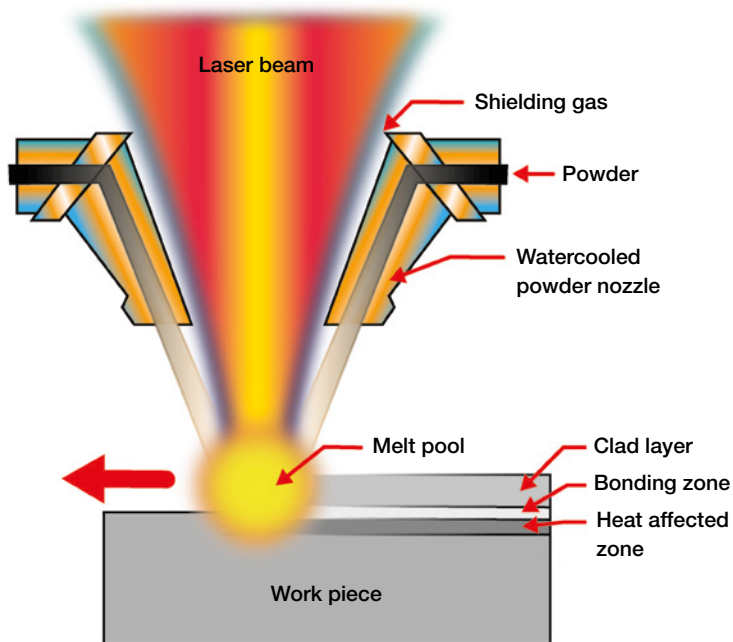
- Up to 23' in length
- Up to 100" diameters
- Weight capacity: 50'000 lbs

Bore repairs

- 36" long/stroke
- 3" ID bore capabilities

Case, diaphragm, impeller repair

- Outside diameter: 12" – 72"
- Weight: 5'000 lbs



How does LMD work?

LMD uses a high-powered laser beam that is focused on a small area. This high concentration of energy creates a melt pool in which metallic powder is then introduced, carried by gas, through a nozzle. The added powder fuses to the substrate creating a metallurgically bonded coating or cladding. With the use of the laser beam, the heat input and melt pool is very precise and localized compared to other welding processes.



Compressor case axial fits with corrosion pitting



LMD was used for a dimensional restoration



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