

Laser cladding

Description

Laser Cladding is an advanced surface overlay process that uses a high-energy laser beam to **locally melt** the feedstock material (metal powder) and metallurgically bond it to the substrate. The result is an **extremely resistant, dense, and pore-free coating**, ideal for restoring worn components or drastically improving the performance of new parts.



Process

A high-power laser simultaneously melts the surface of the part and the metal powder delivered by a feeding system. Rapid cooling generates a **fine and compact microstructure**, with high metallurgical adhesion and precise thickness control.

The process has a minimal heat-affected zone, **allowing also the treatment of components sensitive to deformation.**

Highlights

- Metallurgical bond between feedstock material and substrate
- Minimal porosity and extremely fine microstructure
- Reduced distortions due to low heat input
- Possibility of restoring components with high precision
- Long coating service life even under severe conditions
- Perfect for regeneration of expensive or difficult-to-replace components

Applications

- Dimensional restoration of rolls, shafts, and high-wear components
- Wear-resistant coatings for drawing and rolling lines
- Components exposed to corrosion, thermal shock, or severe abrasion
- Oil & gas, energy, mechanical, steel, and aerospace sectors
- Complex parts requiring high geometric precision

Applied Materials

- High-strength Ni- and Co-based alloys
- Wear-resistant alloys (Stellite, Tribaloy, etc.)
- Anticorrosion alloys
- Anti-friction or anti-erosion materials
- Metallic carbides in metal matrix (MMC)
- Carbide powders
- Ceramics

Coating Thickness

- Typically 0.3–3 mm
- Multilayer coatings available for greater thicknesses

Technical Data

- Maximum flat area: 1000 × 2000 mm
- Maximum outer diameter: 750 mm
- Maximum length: 2,000 mm
- Maximum weight: 300 kg



Treatable Materials

- Carbon steels
- High-alloy and stainless steels
- Hardened steels
- Cast irons (with specific parameters)
- Nickel- or cobalt-based superalloys



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