Laser Cladding

AKMELOGI
Engineering
Hi-tech Machinery
Remanufacturing Services
Flexible Manufacturing Systems
Laser Cladding

A welding process, which uses added material in powder or wire form to build up and restore high-value components to their original dimensions.

It is an interdisciplinary technology utilizing laser technology, computer-aided design and manufacturing, robotics, sensors, control and powder metallurgy.
Laser Cladding

Innovative Aspects

- Laser cladding
- Laser hard-facing
- Laser hardening
- New part manufacture
- Component restoration enhanced wear resistance
- Wear control
- Corrosion resistance
- Ceramics
Laser Cladding
Laser Cladding
Laser Cladding
Laser Cladding

Main Advantages

- Life extender of components (up to 5 times)
- Low heat input thus minimal area affected by heat
- Low distortion even to heat sensitive components
- Rapid solidification
- Low dilution (chemical transformation of the base material)
- Less post-processing afterwards
- Low operating costs
- Fast, accurate and easy to automate, thus increases productivity
- Reduction in turn-around times
Laser Cladding

- A novel process for coating surfaces using specific materials of high quality
- The plated material has potent metallurgical consistency with the substrate
- The process develops low mixing layer substrate (about 0-2%), enabling thinner coatings with better chemical and physical properties than the conventional welding processes
- Lower material cost up to 50%, processing following the retread up to 25%, time of delivery in 1/3.
- Capacity of retreading metals, where other processes cannot
Applications

In any case of worn high value components, such as:

- Steel rollers
- Engine components
- Excavation tools
- Turbine blades
- Axles & bearings
Market Applications

- Naval engines
- Aerospace
- Agriculture
- Automotive
Market Applications

- Construction
- Defense & homeland security
- Mining - Mineral Processing
- Pulp & Paper
Market Applications

- Pumps & Engines
- Oil - Gas
- Power Production
- Textiles
- Transportation
Naval Engines

- Crankshaft
- Piston Crown
- Exhaust Valve Spindle & Seat
- Exhaust Valve Housing
- Cylinder Cover
- Heat Exchanger
- Rebabbitting
- Blisks
- Connecting Rods
- Piston Rods
- Cylinder liners
- Cylinder heads / covers
- Exhaust Valve Cages
- White Metal Bearings & stern tubes
- Impellers
- Blades
Aerospace

- Landing gear
- Gas turbine engines
- Propeller hubs
- Hydraulics
- Aileron Actuators
- Pitch roll channel assemblies
- Ramp actuator
- Propeller components
- Barrel and pin assemblies
- Lever support
- Strut assemblies
Agriculture

- Chisel ploughs
- Plough shoes
- Cultivator disk
- Ridger bodies
- Crushers
- Blades
- Beaters
- Flywheel w/ knife
- Drive shaft
- Augers
- Ground engaging implements
- Cutting edges
Automotive

- Gearshift fork
- Door locks
- Body parts
- Braes
- Cylinder liners / sleeves
- Wear plates
- Camshafts
- Piston rings
- Valve seats
Construction

- Grader blades
- Bulldozer components
- Trenchers
- Drilling
- Augers and casings
- Asphalt and concrete pavers
- Tunneling and boring equipment
- Loader excavator
- Drive Sprockets
- Snowplow shoes

- Backhoe buckets
- Blades / teeth
- Pivot-point holes
- Bulldozer blades/cutting edges
- Scraper blades
- Cutting edges
- Backhoe and excavator booms
- Hydraulic rams
- Grousers
- Drive rollers
Defense & homeland security

- Blisks
- MEMS
- Tracked vehicles
- Track pins
- Hard Chrome replacement
- Hydraulic rams
Mining - Mineral Processing

- Crushers
- Loaders
- Dump truck beds
- Conveyors
- Chutes
- Alpine picks
- Grinding rolls
- Toothed roll

- Cone crusher
- Excavator scoop
- Conveyor screw
- Crusher hammer
- Rotary hoppers
- Large bells
- Pressure rollers
- Support rollers
Pulp & Paper

- Grinder bed knife
- Grinder shielding
- Stone shaft
- Chipper knife disk
- Pulp bale saw
- Disk refiner shaft
- Rotary valve rotor
- Pump rotor
- Pump shaft
- Feed screws
- Yankee dryers
- Doctor blades
Pumps & Engines

- Pump sleeves
- Fuller screws
- Valve chest
- Shafts
- Bearings
- Needles
- Impellers
- Kaplan turbines
- Francis wheels
- Pelton wheels
- Needle valves
- Wicket gates
Oil / Gas

- Extravators
- Rollers
- Loaders
- Stabilizers
- Drill collars
- Valve components
- Rock bits
Power Production

- Turbine blades and diaphragms
- Steam bypass stop valves
- Coal-fired boiler
- Pump shafts
- Plough blades
- Ash pump rotor
- Tdust extraction fans
- Waterwall panels
- Grinder roller
Textiles

- Take-up Rolls
- Draw Rolls
- Grooved Rolls
- Package Drive Rolls
- Tow cutter blades
Transportation

- Trimming chisel
- Ballast sprocket
- Skirt plate
- Raid ends
- Retarder yoke
- Axle box
- Railroad frogs
Results

- Life extender of components due to the use of specific cladding materials
- Zero to minimal heat affected components
- Optimum metallurgical quality of both the coating and the substrate
Cladding Installation

Our first laser cladding machine constructed in 2005:

- Diode Laser 1000W
- CNC Router with space processing 2x2x3.5m
- Robotic arm
- Multi-head Laser cutting - welding – cladding
- Applicable to all types of machining processes
The System
The System
AKMELOGI
AKMELOGI

16, Idipodos str.
166 75 - Glyfada, Greece
Phone Number: 210 96 500 36
Fax: 210 96 524 23