

Laser Cladding & Hardening

Shanghai Duomu Industry Co., LTD



High-efficiency

Environment

Low energy

Company



Shanghai Duomu Industrial Co., LTD is a high-tech enterprise integration of production, research and development and sales, which has distinctive superiority in welding power source.

We are deft at making the customized production, such as applying in the national project 863 of geomagnetic detection emission source in the fields of exploration of ocean and petroleum.

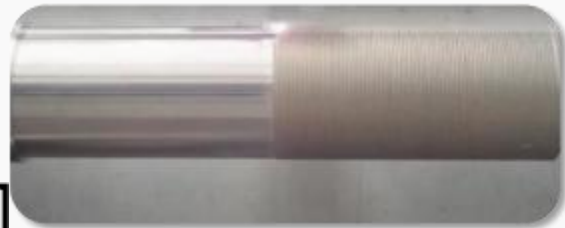


01

Fiber Laser Cladding System

The machine tool for hydraulic support

Laser enhanced manufacturing & remanufacturing technology can repair the surface of hydraulic support, cylinder and gear shaft of coal mine machinery.



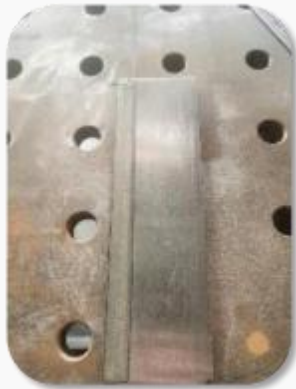
The machine tool for cut bit in coal mining

The beam of high power and density and the powder feeding synchronously by CNC form the super cladding layer, which is to resist wear, resist corrosion, resist heat.



The machine tool for blades

Laser Cladding is the crucial method of enhancing the properties of surface material of work piece. The beam of high power density would be cladding swiftly the various of alloy powder on the affordable base to save cost to improve the abilities of resistance wear, resistance corrosion, resistance oxidation.



Laser Cladding system by hand-held

It is easy to install and operate that is the friendly interface and a improved driven controller.

The high power optical fiber semiconductor system adopts external water cooling mode (QBH, QCS, etc.) as well as customized according customer's requirement.

There is a wide rang of application that we would offered the corresponding control mode and output connections.



A Turn Key of Surfacing Solution

This system is for additive manufacturing on the surface of spherical body

by the S T L alloy powder to enhance the hardness and wear resistance.

The laser power supply Rayco with heat input stabilization, metallurgical

bonding, tiny deformation, low dilution rate, dense texture.

Small granular and low pressure to improve the life-span of work piece.



The cases of Lase cladding

Cladding series product cases

Piston Rod

01

- Material: 65Mn
- Hardness: HRC65.36
- Size: ϕ 14mm*300mm
- Speed: 420mm/s
- Thickness: One side 0.25mm
- Efficiency: 1.6m²/h
- Length: 225mm
- Time: 31s



The place of oil seal

02

- Material: 40Cr
- Surface area: 0.5m²
- Repair parts: oil seal
- Efficiency : 0.25m²/h
- Size: ϕ 400mm*400mm
- Time : 2h
- Cladding thickness: One side 2mm
- No crack and no fall off



More Applications

More application

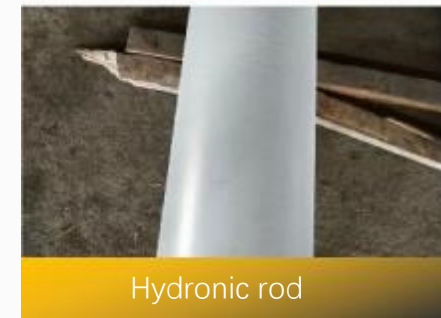
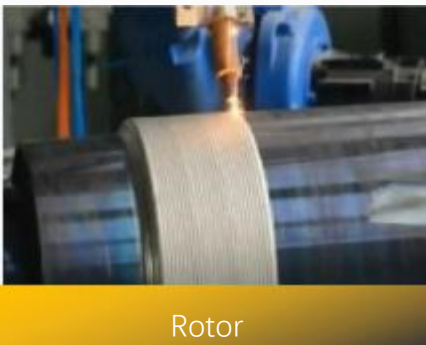
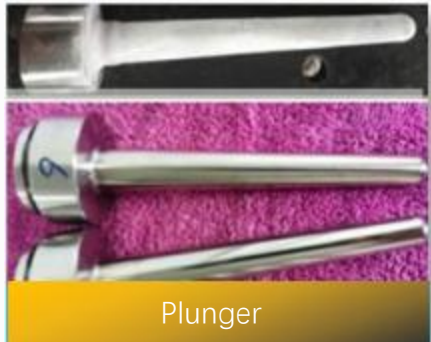
Metallurgy

Mining

Power

Mould

Transportation



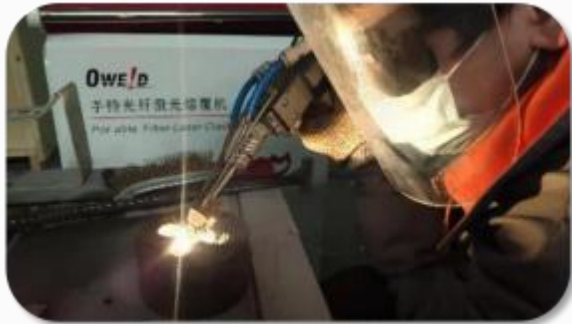


02

Instruction of Laser cladding

----Hand held

Handheld Laser cladding system





03

Introduction of Laser Hardening

Laser hardening system

Laser quenching equipment

Through heating to a phase transition point on the surface of work piece
which it is as cooling, the austenite transforms into martensite from that
the laser hardening completed.



Laser hardening system

Laser quenching equipment

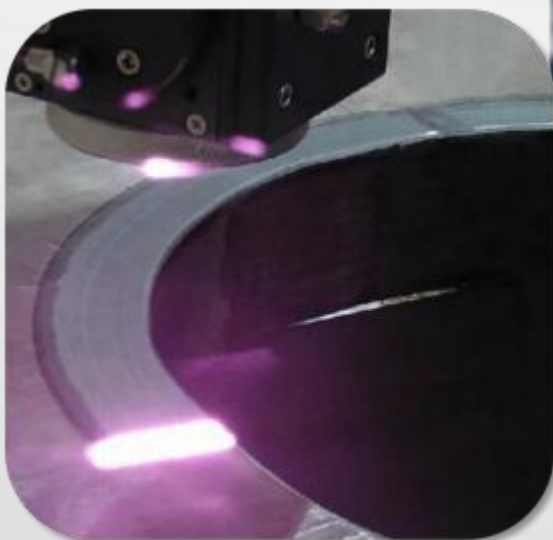
Laser hardening is suitable for carbon steel, alloy steel, carbon tool steel, alloy tool steel, bearing steel, spring steel, hot and cold die steel, martensitic stainless steel, high-speed tool steel, gray cast iron, nodular cast iron, malleable iron, etc.



A Turn Key of Hardening Solution

Provide a complete set of laser quenching schemes.

1. No deformation and high speed of thermal cycle.
2. Bearly damage the surface roughness.
3. No crack, precise controlled by CNC.
4. Precision positioning controlled by CNC.

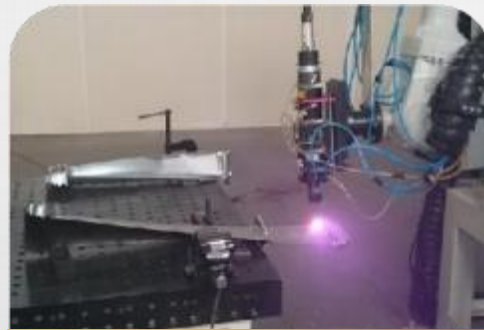


Application of Laser hardening

Application cases of laser quenching



Blade



Blade



Mould

It is high density and fast cooling without the water. It is easy to control the heat depth and working track. It has been replacing the technology of induction hardening and thermo-chemical treatment

04

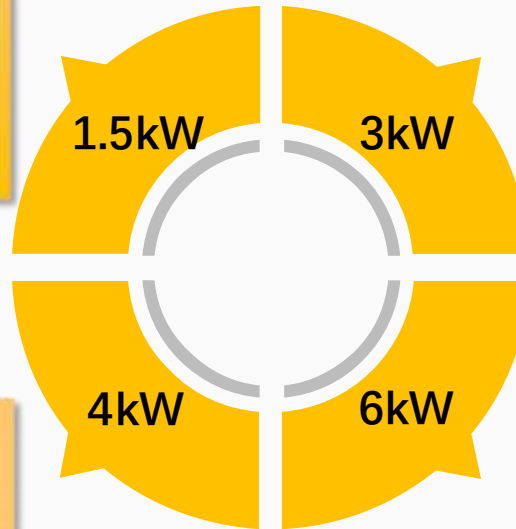
Introduction of Laser Power Supply

Laser Power Supply

Multi-power laser



Power -10%~100%
Size-1100*600*1200mm
Weight- ≈320kg
Voltage -Three phase five wire
AC380V± 10%、 50/60Hz



Power -10%~100%
Size -485*251*900mm
Weight - <85(kG)
Voltage - Three phase four wire
AC340V~AC420V、 50/60Hz



Power-10%~100%
Size-670*990*1160mm
Weight-<280(kG)
Voltage -Three phase four wire
AC340V~AC420V、
50/60Hz

Power-10%~100%
Size -900×960× 1160mm
Weight -<360(kG)
Voltage-Three phase four wire
AC340V~AC420V、
50/60Hz

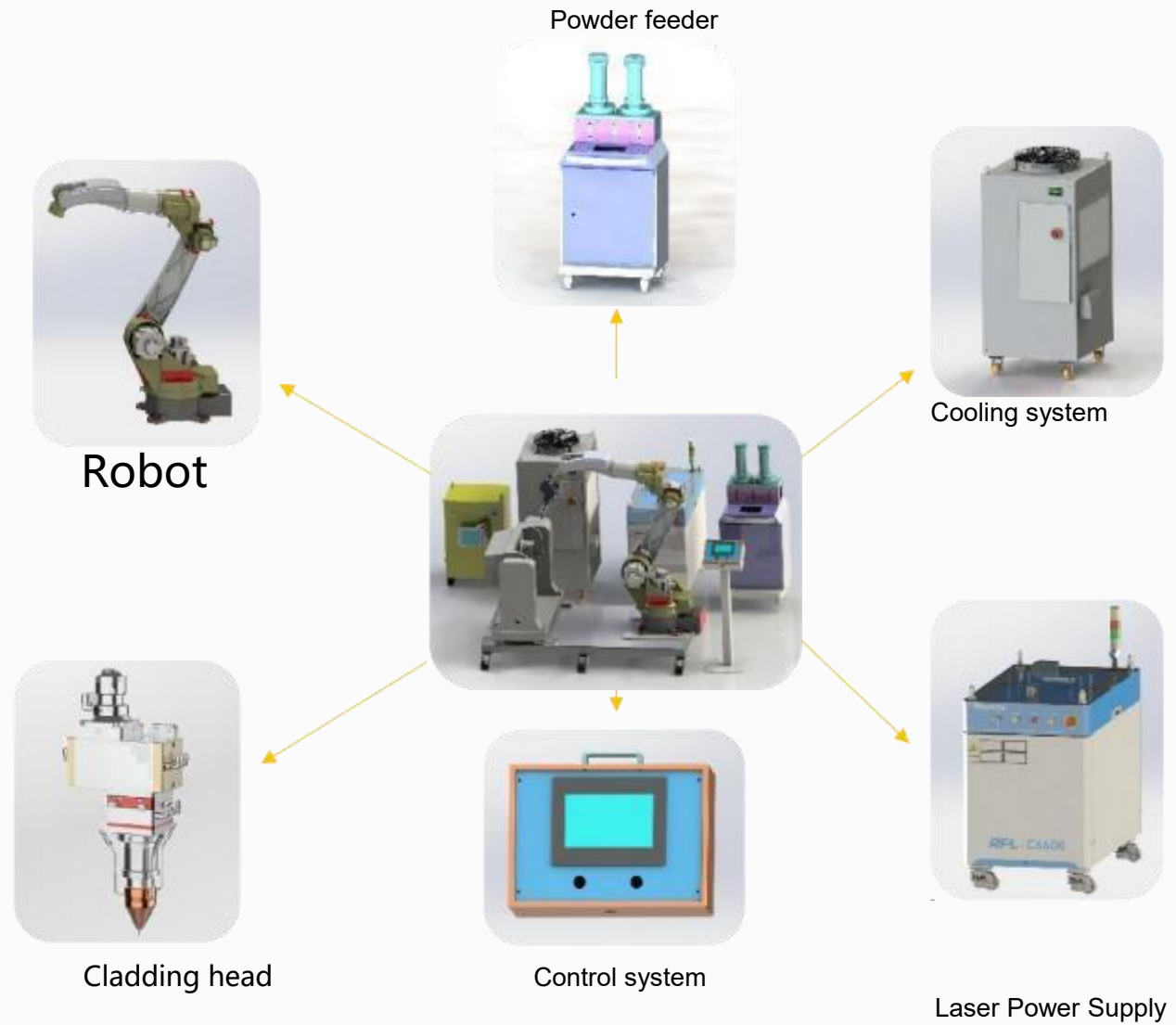


Purchase solution

Complete purchasing scheme

How to assemble a set of Laser Cladding system?

It is consisted of Laser Power Supply, powder feeder, cladding head, Cooling system, programming and tooling (Robot, positioner, Lathe and etc.) Depends on the requirements of surfacing work piece.





05

Instruction Cladding Head

Cladding Head Design

Welding gun design

Unique optical design, the parameters would be customized as your requirements to obtain the super quality



Head for Outer

Maximum: 20KW

The wave length range
900nm~1100nm

Lens coating is with higher
reflectivity

Direct water cooling avoid the
problem result of off-centering.

Design of module it would play
the different roles only by
replacing the elements.

Head for inner

Maximum: 4KW,

The wave length range
900nm~1100nm;

Minimum diameter:110mm

Maximum depth: 800mm;

All circuits are inside of the head

Maximum depth by
customized:2400mm

The design of coaxial air flow module
would extend the service term of lens

Head for hardening

Maximum 6KW;

The wave length range: 900 -1100nm

The temperature sensor
transmission optical fiber free
;

Temperature range: 400 -2500°C

Response time $\leq 1\text{ms}$,
Exposure time $\leq 0.5\text{ms}$;

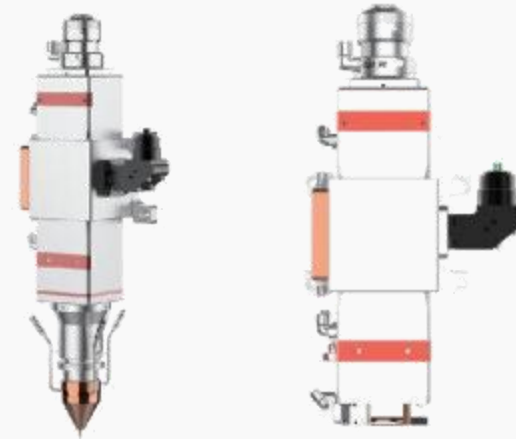
Easy to replace the shield lens

The size of optical spot would
be customized ;



LC300 20KW Laser Head

Maximum power	≤20KW
Diameter	49.5mm
Collimating focal length	75、 100、 125、 150、 200mm
Focal length	300~ 1000mm
Specification of lens	Φ50*2
Type fiber interface	QBH、 QD、 LLK-B、 LLK-D、 LOE
Optical way	Reflective
Weight	~7.5KG



LD150 4KW Laser Cladding Head

Maximum power	≤4KW
Diameter	48mm
Collimating focal length	100mm
Focal length	300~ 1000mm
Specification of lens	Φ50*2
Type Fiber Interface	QBH、 QD、 LLK-B、 LLK-D
CCD Type interface (Optional)	TYPE-C、 TYPE-CS
Weight	~6KG



LC200 5KW Cladding Head for Inner

Maximum power	≤5KW
Type fiber interface	QBH、QD、LLK-B、LLK-D , LLK-B
Collimaying focal length	75mm
Diameter	≥φ200mm
Maximum	Depends on the work piece
Forerake	90°
Particle size	15~150μm(Suggest15~53μm)
Wave Length	900-1100nm
Weight	~5KG



LD100 4KW Cladding Head for Inner

Maximum power	≤4KW
Type fiber interface	QBH、QD、LLK-B、LLK-D
Hole Diameter	33mm
Diameter	≥φ120mm
Length	≤800mm (One side)
Lean	100°
Particle size	15~150μm(建议粒径15~53μm)
Wave Length	900-1100nm
Weight	~18KG



LH300TC 6KW laser Head

Maximum power	≤6KW
Diameter	49.5mm
Collimaying focal length	150mm
Focal length	300~1000mm
Specification of lens	φ50*2
Type fibe interface	QBH、QD、LLK-B、LLK-D、LOE
Focus Mode	Automatic
Temperature range	400 ~ 2500度
Response time	≤ 1ms
Exposure time	≤0.5ms
Control method:	Analog output
Weight :	~18KG

Accessories of Laser Cladding

Laser accessories

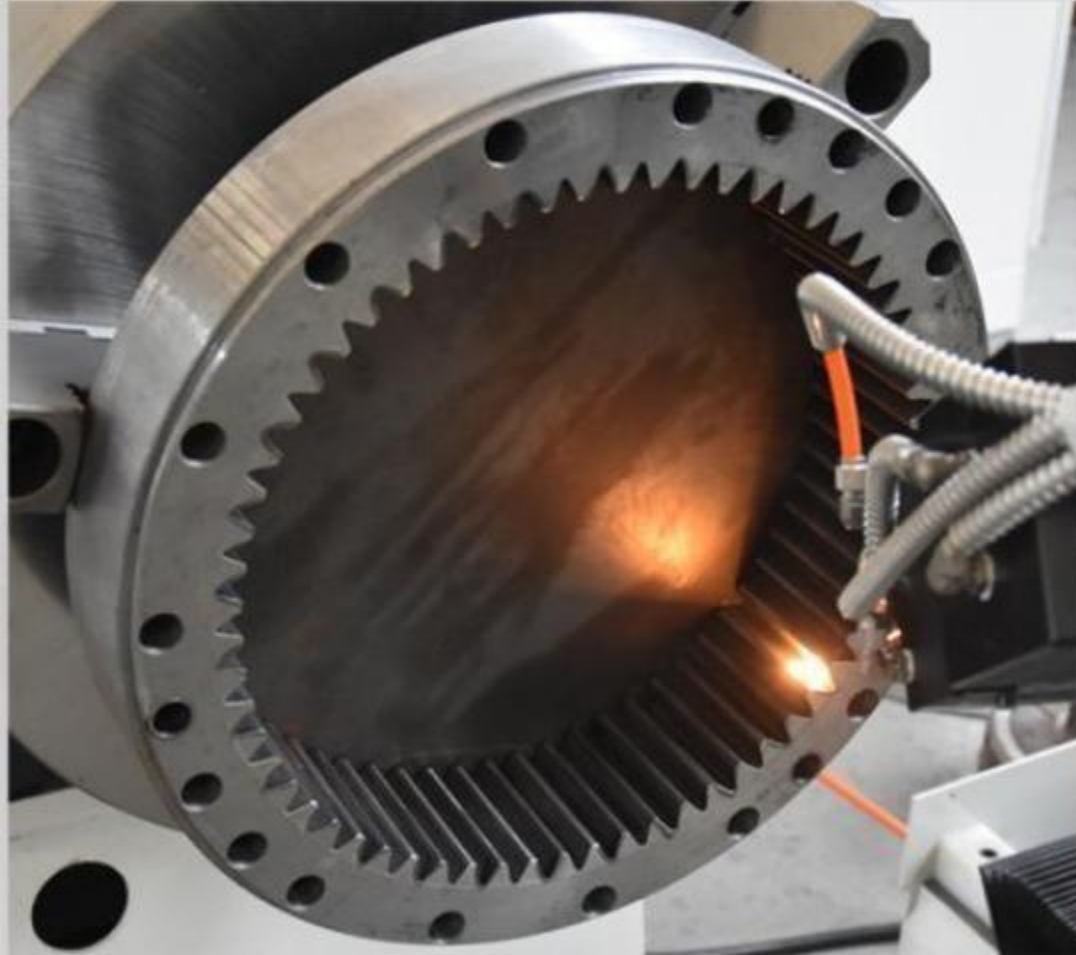
Features of water cooling

- ① Adopt high quality pump of stainless steel cold water loop, flow volume, low noise, long service term.
- ② LCD controller, real-time display cooling water CPU fully automatic control system, man-machine fault automatic diagnosis.
- ③ It is easy to realize the centralized control and monitoring CNC , multi-protection function and the remote control terminal and passive alarm terminal.
- ④ The dual-temperature water cooling machine provides the stable real-time water temperature control as well as cooling the lens with the water of the temperature close to the environmental, It is the solution of the lens damage in the use due to the low temperature water cooling to condensation. It is best selection for the Laser Cladding System.



(Single Tin /Double Tin)

Powder feeder	
Motor	Servo motor
External interface	TC P/I P , I/ O
Rotate speed	0 - 1 0 r/ m i n
Tin volume	1 . 5 L 、 3 L
Volume of feeding	1 - 3 0 0g/ m i n
Feeding error	$\leq \pm 1.5 \%$
Pressure	$\geq 0.5 \text{ MPa}$
Carrier flow	2 - 2 5 L/ m i n
Air flow control	Float flow meter + Pressure monitoring
Distance of feeding	1 - 1 0 m
Size of powder	1 5 - 2 0 0 μm
Dimension	6 0 0m m* 5 0 0m m* 14 0 0m m



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