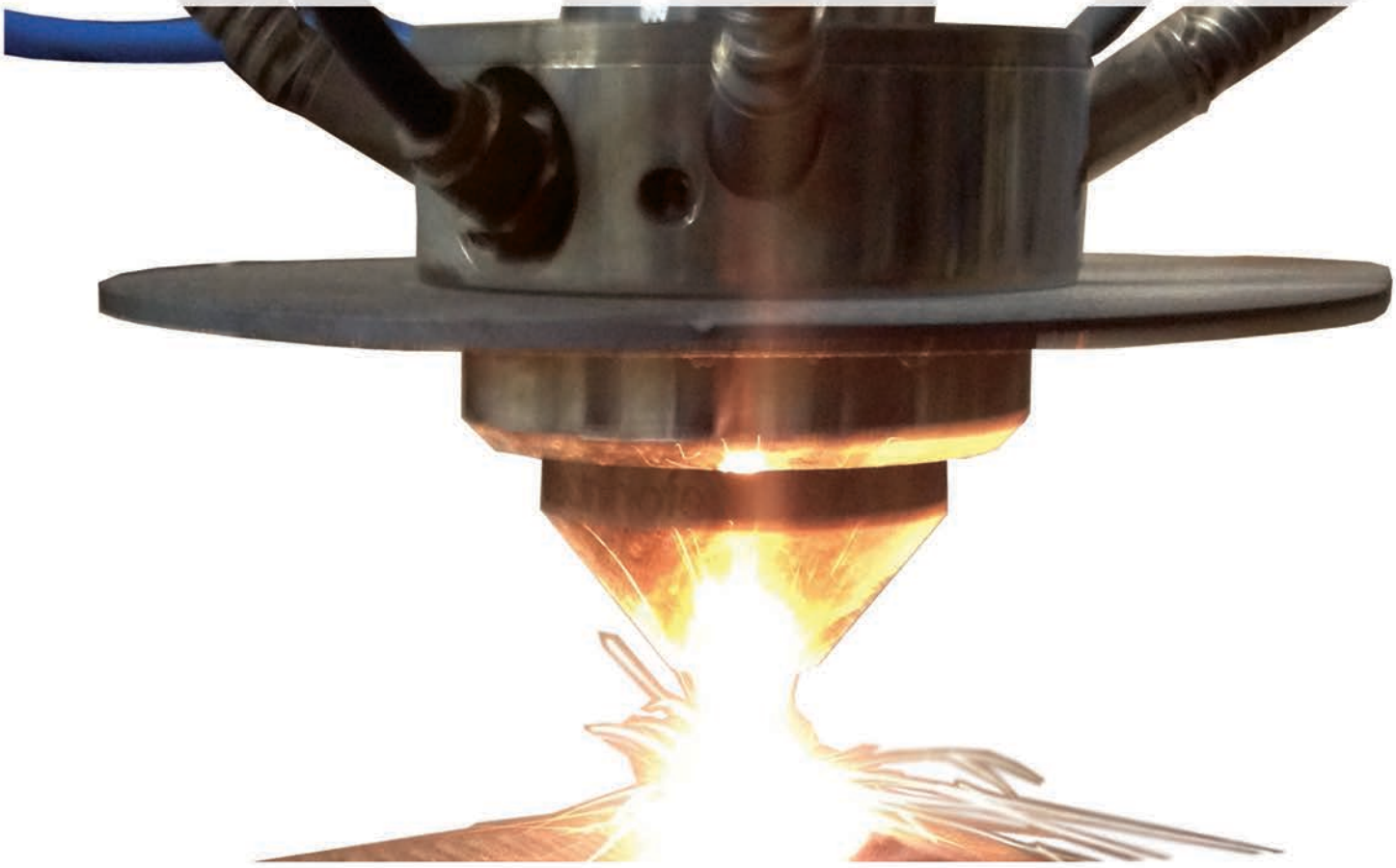
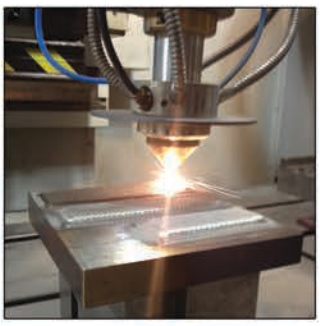
LASER-PTA

HEAT TREAT & CLADDING





ADVANTAGES

- Fully Automated CNC & Robotic Processing
- Plasma Transferred Arc Option
- Repeatability
- Metallurgical Bond
- Outstanding Wear Protection
- Wide Range of Base Materials
- Minimal Distortion
- Patented Process
- Over 50 Years Experience in Welding

APPLICATIONS

- Down Hole Tools
- Gears
- Mining
- Aerospace

Universe Machine CORPORATION

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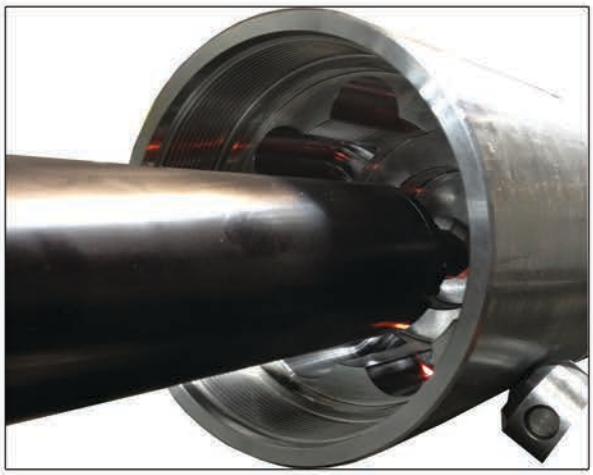
LASER HEAT TREATMENT



Laser Heat Treatment is a technique used to harden the surface of heat treatable steels. This is accomplished by heating the surface of the steel rapidly with a laser, transforming it into an austenitic phase. As the heat generated from the laser rapidly conducts away from the surface of the steel, a very hard microconstituent is formed. drastically increasing surface hardness.

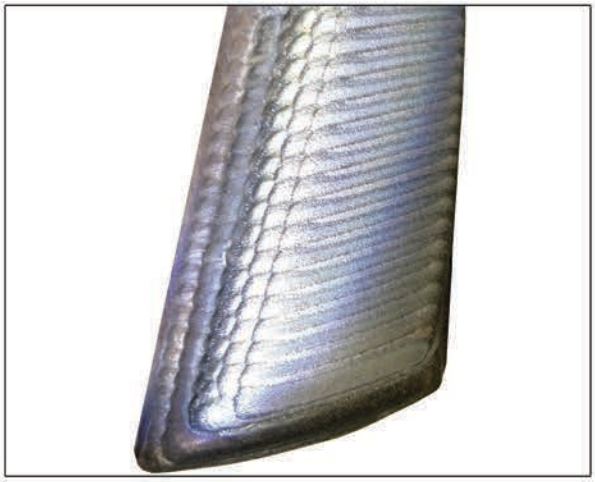
Laser heat treatment is vastly superior to conventional surface hardening techniques since it is possible to only harden specific areas of the steel, leaving the remainder of the steel unaltered. As an added benefit the surface of the steel which has been treated undergoes no damage or warping.

Universe Machine has a new process to Laser Heat Treat which leaves no areas of shallow hardening.

We have over 50 years of experience in machining and welding, with the procedures and technical personnel necessary to laser harden virtually any part configuration.

Materials	Low Alloy Carbon Steels
Hardness Range	45-62 HRC (440-790HV)
Depth of Hardening	0.020”– 0.060” (0.5-1.5mm)
Inner Diameter Hardening	Yes
Outer Diameter Hardening	Yes
Pocket and Slot Hardening	Yes

LASER & PTA CLADDING



Laser cladding is a process where a laser is used to metallurgically bond a coating onto a part to improve properties. There is the added benefit of nearly no dilution to the base material.

Universe Machine has procedures in place to overlay Inconel, Tungsten Carbide and Diamond onto virtually any steel substrate, including White Iron. With advanced automation control at our disposal, we can clad even the most complex geometry’s with precision.

We are one of few companies who can overlay Diamond, which lasts twice as long as Tungsten Carbide.

Universe Machine has the expertise to overlay new parts for superior properties, or refurbish and repair used parts.

Base Material	Low alloy steel, Stainless Steel, and White Iron
Overlays	Inconel, Tungsten Carbide and Diamond
Overlay Thicknesses	0.020”-0.375” and over (0.5-10mm)

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