

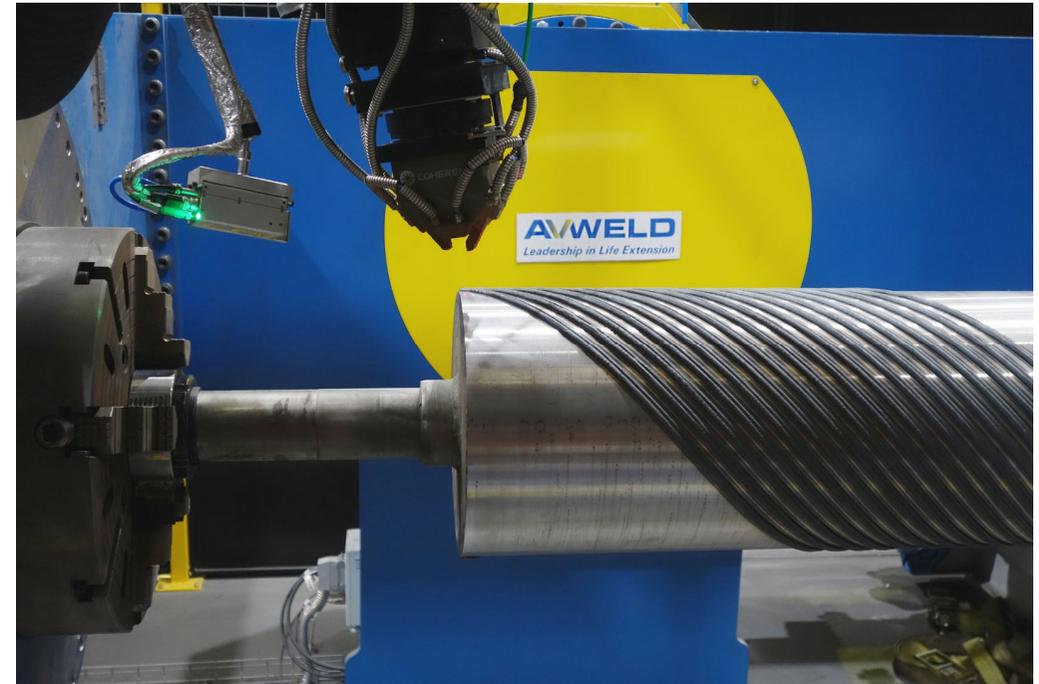
Product:	Laser Cladding
Industries:	Various Industries
General Overview:	Robotic Laser Cladding applies metallurgically bonded coating to almost any substrate to increase resistance to wear or corrosion
Expected life extension:	1-10+ times

In late 2020 Awmeld have commissioned our brand new robotic laser cladding system. The high-powered Coherent 10kW direct diode D-series laser unit is the latest and most powerful laser cladding system of its type in Australia. The robotic cell includes capacity for welding 30 tonne jobs, up to 3m diameter and 10m long.

What is laser cladding?

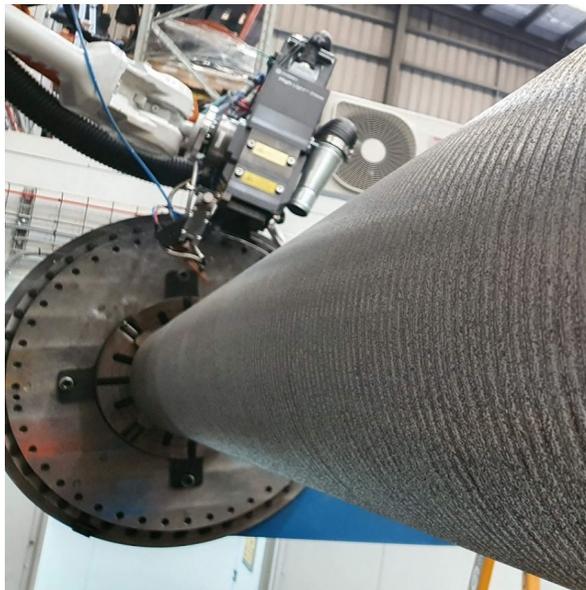
Laser cladding utilises a high-powered energy source to melt an additive stock material and weld it to the substrate, providing the advantageous properties of the additive material to the surface. Because the laser energy is so concentrated, it allows for the cladding material to have a full metallurgical bond, without the disadvantages of typical welding processes by minimising heat affected zone (HAZ), dilution and distortion.

Laser cladding is primarily used to apply coatings to parts which are subject to the individual or combined effects of erosion, abrasion, corrosion, or high temperature. It can also be used to dimensionally restore worn components. Common cladding materials include Tungsten Carbide, Nickel and Cobalt Alloys (such as Stellite, Inconel, Hastelloy), Stainless Steel, Iron-Based Hardfacing.



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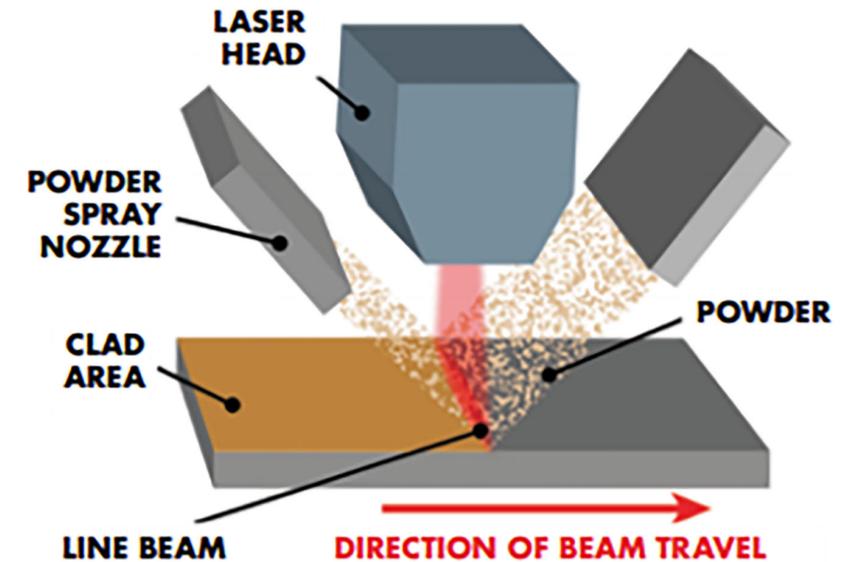
	HVOF	PTA	Laser Cladding
Heat Source	Gas Flame	Plasma/Electric Arc	Laser Beam
Coating Thickness	0.05-0.5mm	0.5-5mm	0.1-10mm
Deposition Rates	1-9 kg/h	1-5kg/h	up to 30kg/h
Dilution	0%	5-15%	1-5%
Bond Type	Mechanical	Metallurgical	Metallurgical
Bond Strength	< 80MPa	< 800MPa	< 800MPa
Heat Input	Low	High	Medium
Porosity	>5%	100% dense	100% dense



Laser Cladding Advantages:

- Metallurgical bond vs. mechanical bond
- Low dilution => 1 – 5% typical (~ 1/3 dilution of PTA process)
- Highly controllable/repeatable and efficient process
- Smooth clad = less post machining
- Small heat effected zone = removes need for post weld heat treatment or stress relief

HIGH POWER DIODE LASER POWDER CLADDING



- High quench rates => finer grain structure => higher corrosion potentials
- High deposit speed compared to thermal spray or PTA.
- High deposit efficiency (>80%)