

Cat® LaserClad500

HYDRAULIC LEG & CYLINDER COATING



Cat® roof supports must operate in very severe underground applications where high resistance to wear and corrosion is of key importance. Due to the superior corrosion resistance against seawater, strong acids and even caustic chloride solutions, Caterpillar uses the Cat LaserClad500 coating for the surface treatment of hydraulic cylinders in underground mining operations.

Wear Protection and Corrosion Resistance

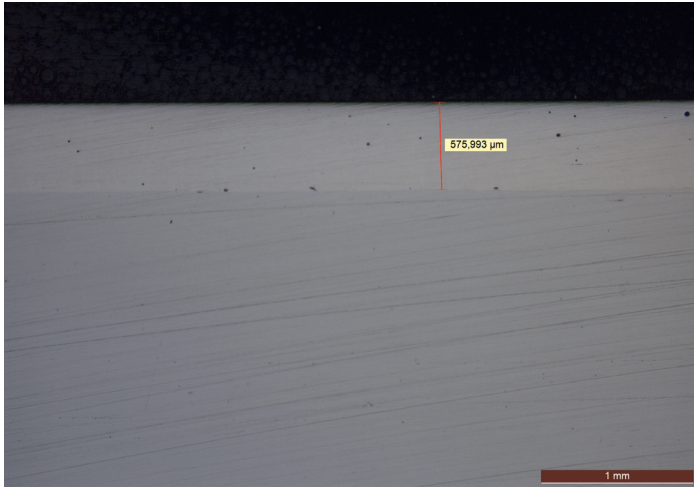
Cat LaserClad500 is a newly developed anti-corrosion treatment for underground legs and cylinders - meeting the highest corrosion requirements from underground mines in combination with the hydraulic operation for such surfaces. The coating consists of a CoCr Mo-alloy and is applied to the leg and cylinder surface by robotic laser cladding techniques. It provides excellent wear characteristics – especially in underground mining applications where severe structural conditions cause high loading on operating surfaces (e.g. roof support leg cylinders). The coating technology has been developed to achieve excellent bonding to the high strength tubing material while not impairing the microstructure of the base material. Depending on the individual application the coating composition and the thickness can be optimized to specific customer requirements.

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Properties

LaserClad500 has excellent cavitation, galling and metal-to-metal sliding wear resistance, but is not recommended for severe hard particle abrasion. The surface can work harden considerably during wear or even during machining, and the use of correct machining tools and techniques is important to achieve optimal results.

The coatings are applied by the laser-cladding method. This is done with a CNC-controlled cladding system. The coating material is present as a powder and is melted and applied by means of a laser.



Metallographic Section of Cat LaserClad500 plating

Cat LaserCoat500 is plated with approximately 500 µm. This guarantees a reliant and service free coating surface over the life time of the hydraulic component.

Unless stated otherwise in the manufacturing documents, the layer thickness is at least 350µm.

Hardness measurements are to be carried out on the cross section with HV1 according to DIN EN ISO 6507-1. The average hardness must reach at least 350HV1.

Advantages of the Cobalt-based alloy

- Adhesion Strength
- Hardness
- Coefficient of friction
- AASS Resistance

Wear Resistance

The Cat LaserClad500 coating passed numerous validation tests performed at Caterpillar laboratories and leading industry test houses. This includes mechanical validation testing according to mining standards and stroke endurance testing under extreme side loading conditions. During these tests no stick-slip-effects or impairment of sealing and wear band material occurred.

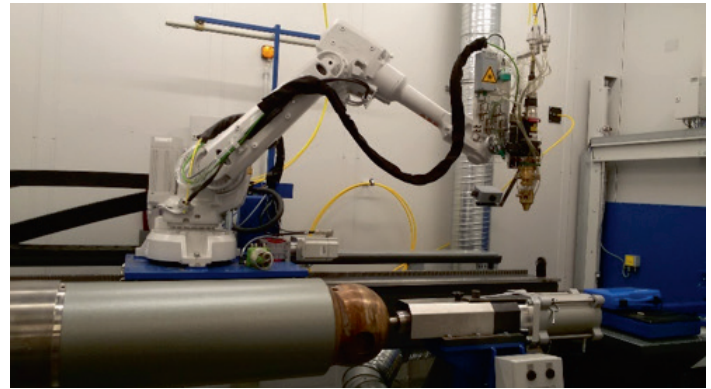
Corrosion Resistance

The coating has excellent corrosion resistance against environmental influences of all kinds. Proof of corrosion resistance is provided by a neutral salt spray test according to DIN EN ISO 9227. The requirement of 1000h applies without any detectable base metal corrosion.

Cat LaserClad500 is resistant to localized corrosion (pitting and crevice corrosion). It offers resistance to many aggressive environments, and exhibits excellent wear properties, particularly with regard to slurry erosion, cavitation erosion, and galling.



Cat roof support with Cat LaserClad500 coated hydraulic cylinders



CNC-controlled laser-cladding process

Cat LaserClad500 – a Precision Hardfacing Solution

- Minimal dilution due to low heat input
- Controlled energy supply possible
- Fine microstructure due to optimized cooling rate
- No tool wear
- Compact technology
- Providing superior results of hardness, homogeneity, purity, and microstructure

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at www.cat.com/mining

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