

Short description

# Alternative piston rod coatings

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Liebherr uses a high-quality hard chrome piston rod coating in the manufacture of hydraulic cylinders.

This ensures protection of the piston rod when in use, as well as corrosion resistance and a high resistance to wear. In addition to hard chrome, the market also offers other alternatives with different properties. Depending on the application and requirements, there is a choice of options for suitable piston rod protection.

Liebherr has therefore been researching alternative piston rod coatings for several years in order to be able to offer a versatile portfolio for the future. Good technical properties, cost-effectiveness and consistent quality are at the heart of the developments.

#### **Alternative coating processes**

- Laser Cladding (build-up welding)
- HVOF (high speed spray process)
- Galvanic Cr6-free coating

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# Coating processes at a glance

## Laser Cladding

### Features

- The coating material is welded to the piston rod material in powder form using a laser beam
- The piston rod is ground to the desired final diameter with the required surface quality for the seals

### Advantages

- Low heat input creates a very strong bond between the coating and the base material
- Very high corrosion resistance in dynamic applications

### Disadvantages

- Coating may discolour in use

## HVOF

### Features

- A powder alloy is applied by a gas jet at very high speeds
- High energy and high particle temperature bake the powder grains together to form the coating

### Advantages

- High quality coating with a very good corrosion resistance
- The top layer is less sensitive to mechanical pressure load

### Disadvantages

- Manufacturing costs remain high

## Galvanic Cr6-free coating

### Features

- No allegedly polluting Cr6 is deposited during the coating process

### Advantages

- The Cr6-free coating is not harmful to organisms as it lacks the toxic properties of Cr6 and contains several hard chrome properties

### Disadvantages

- Corrosion resistance can only be guaranteed with a protective layer (nickel)

## Working together for the future

Only through extensive field testing under real operating conditions can these coatings be tested for their exact properties and behaviour. These tests are important to ensure safe international series production.

Liebherr works closely with its customers to find suitable solutions for all relevant applications. Users can benefit from tailored advice from our hydraulics experts and support throughout the development process.

Please do not hesitate to contact us if you are interested!