



CERTIFICATION FOR COATING OFFSHORE HYDRAULIC CYLINDERS WITH THE EHLA PROCESS

Task

The surface of hydraulic cylinder piston rods is exposed to extreme wear and corrosion stress. This applies in particular to offshore applications since they are in direct contact with salt water. So that the surface can be protected against the harsh environmental conditions, metallic coatings having layer thickness range of 100 to 300 µm are commonly used. If a coating fails, a company can suffer costly downtime and create immense environmental hazards. The replacement or repair of the piston rods is difficult, time-consuming and expensive because of their limited accessibility. For a long time, galvanic processes have been state-of-the-art for the coating of piston rods in the offshore industry. However, due to stricter requirements in environmental protection, CO₂ reduction and energy efficiency, there is now a growing need for alternative, resource-conserving and automated coating processes with a high layer quality.

Method

In cooperation with the Dutch system integrator Hornet Laser Cladding B.V., a machine that coats the hydraulic cylinder piston rods – up to ten meters long – was installed at one of the world's leading manufacturers of tailor-made hydraulic cylinders, IHC Vremac B.V. The system uses the extreme high-speed laser material deposition (EHLA) process developed by Fraunhofer ILT. The advantages of this new process are that high-quality, thin and metallurgically bonded metal protective coatings can be applied economically on large components.

Results

The entire coating process was reviewed by MME Group of Ridderkerk under the supervision of Lloyds' Register Nederland. The system was proved to have complied with all requirements of ISO 15614-7 (welding method test), EN 14732 (operator and installer test) as well as the salt spray test according to ISO 9227 and was certified by Lloyd's Register EMEA Marine.

Applications

The EHLA process is basically suitable for coating all rotationally symmetrical components for protection against corrosion as well as for abrasive and adhesive wear.

Contact

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- 3 Hydraulic cylinder in the offshore sector (source: IHC Vremac B.V.).
- 4 Hydraulic cylinder piston rod coated with the EHLA process.