

Coating service solutions Metco PUMP

For extreme abrasion resistance

The challenge

Seawater injection pumps typically face extreme abrasion, chemical attack and cavitation erosion in daily operation.

These pumps are used to inject water from the well back into oil fields to maintain the pressure required to bring the oil to the surface.

The injected water is frequently loaded with abrasive particles, such as quartz sand, which quickly erode conventional duplex stainless steel wear parts. Severe abrasion results in increased clearances and premature reduction in pump performance. Ultimately, the pump parts abrade to the point where costly service or replacement must be performed.

Some water injection pumps, made with wear parts originally overlaid with cobalt-based alloys (intended to increase hardness and wear resistance), have failed in service after only 700 hours of run time at full capacity. This emphasized the need for extreme abrasion resistance on all wetted surfaces, such as casings, impellers, wear rings, seals, throttle sleeves, shafts, balance drums, liners and valves. Pump parts, either made with solid tungsten carbide inserts or coated with tungsten carbide, can operate trouble-free in these corrosive and abrasive environments for thousands of hours. Tungsten carbide, however, is expensive, very brittle and requires extreme care in handling, as its thermal expansion coefficient is lower than that of steel.

The need, therefore, was to develop an economical and long-lasting coating process for pumps that could stand up to corrosion and abrasion for 30,000 to 40,000 hours of run time without the brittleness and thermal expansion concerns associated with tungsten carbide.



The impeller blades and the shaft of a large centrifugal seawater injection pump. Areas of pump that will be subjected to erosive and corrosive action of seawater loaded with abrasive particles have been thermal spray coated with Metco PUMP long-life coatings.

Our solution

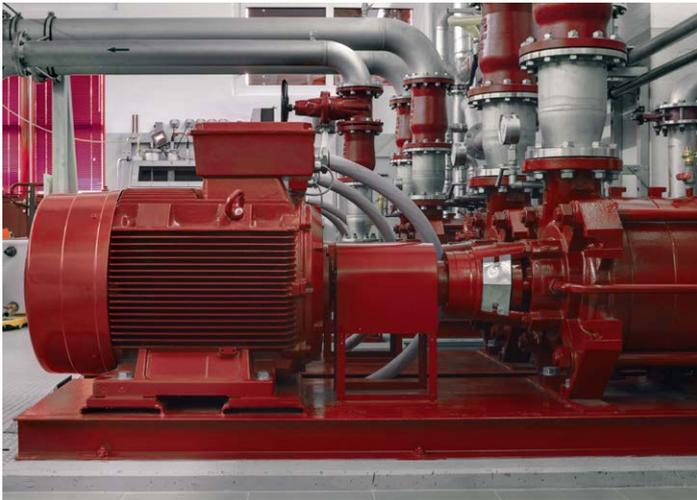
Intensive research and field testing have produced Metco PUMP coatings. These coatings have outperformed both duplex stainless and cobalt-based alloys in all erosion/corrosion tests. In this test program, different coatings and bulk materials were subjected to abrasion, dry particle erosion, corrosion and combined erosion/corrosion attack. Metco PUMP coatings were shown to have excellent resistance to the synergistic action of a corrosive environment and simultaneous impact of abrasive particles.

The benefit

Metco PUMP coatings have been applied to the stationary wear rings and directly onto the wear surfaces of the impellers of seawater injection pumps used in North Sea oil production. One of these pumps was taken out of service after 4800 hours to be utilized elsewhere. It was found that the coated parts at the impeller inlet exhibited hardly any signs of wear, and all parts were still within design tolerances.



Coating applications engineer monitors the application of a Metco PUMP coating to vital pump parts, such as impellers, casings and wear rings.



Large industrial pump. Metco PUMP thermal spray surface treatment protects industrial pumps against abrasion, erosion and corrosion.



Laboratory and field tests have proven that Metco PUMP coatings, developed for pump components subject to severe abrasion, significantly increase service life.



Information is subject to change without prior notice.