

Protect performance critical surfaces with Thermal Spray coating solutions for improved pump efficiencies

The application of Thermaspray's protective thermal spray coatings reduce degradation processes on performance critical pump components to extend operating life and improve pump efficiencies for optimised uptime and increased production.

Pumps are essential in many heavy industries including mining, petro-chemical, and power generation. As they normally operate in extremely stringent and corrosive environments, they are subject to degradation processes such as mechanical wear, corrosion and cavitation which assault the performance critical surfaces in pumps, leading to increased vibrations, a reduction in service life and a continuous decline in throughput and pump efficiency.

Over the last decade there have been significant technological advancements in the field of thermal spray coating technology with new coating materials and spray processes that significantly outperform the more traditional coatings. Thermal spray refers to a coating process where the coating is produced by the projection of a molten stream of particles onto a surface. "Thermal spray is a collection of techniques which include HVOF (High Velocity Oxygen Fuel (figure 1)), plasma, flame spray, arc spray, etc. used to apply materials to substrates," explains Paul Young - Spray Shop Manager - at Thermaspray. "These techniques can be applied in any industry such as mining, printing, etc. where there are surfaces suffering decay."

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Figure 1: Pump casing - thermally sprayed with the HVOF process

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“The manufacture of critical components from optimal wear and corrosion resistant materials are often restricted by cost considerations, so most of the work that we do is on new pump parts for key Original Equipment Manufacturers (OEM) customers but refurbishment is possible on parts that have not been too severely damaged,” explains Young. To prepare a new or worn part for coating, we take it down to the substrate and we have the necessary experience and capabilities to produce the final product, new or refurbished, to Original Equipment (OE) specifications.”

New uncoated parts such as impellers (figure 2), rings diffusers, casing rings and shafts, are normally received from the OEMs disassembled. Once Thermaspray has applied the relevant coatings, the parts are returned to the OEMs for re-assembly. The application of protective coatings to OE parts offers substantial cost saving benefits to end-users. Coated OE performance critical parts can be refurbished and re-used whereas uncoated OE parts are normally so badly damaged that refurbishment is impossible. “Coating of OE parts often facilitates assembly as parts are easier to slide on and off.”



Figure 2: Pump impeller - thermally sprayed with the HVOF process

Young also points out those small faults can occur on parts during the manufacturing process. “Coating these defective parts is a faster and much more affordable process compared to scrapping and manufacturing a new part. We have the capabilities to take a new part back to what it should be. We can also assist with bringing an undersized part back to size.” Young adds that they also apply thermal spray coatings to spares so that when they are used for replacement, they are already protected.

According to Young, Thermaspray is able, to refurbish worn parts that have not been too badly damaged by corrosion, erosion, wear, tear, caused by rust, acid, salt water, etc. “As these parts are uncoated, we first have to remove the damage – dents or corroded areas -

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before applying the thermal spray coatings.” The removal of the coating material through a grinding process and reapplying the coating can extend both the pump and the coated part’s service life by up to two to three times. By increasing MTBF (Mean Time Between Failures) the extension of the replacement period will lead to substantial savings on replacement costs and keep downtime to a minimum. “Furthermore, refurbishment of a used pump can deliver savings of between 45 and 65% of the cost of a new pump,” conclude Young.

Thermaspray, in a joint venture with Cape Town-based Surcotec, offers an extensive portfolio of engineering and thermal spray coating solutions that extend component life cycles to assist OEM and end-user clients across southern Africa in reducing costs and increasing production. The companies’ world-class quality wear- and corrosion-resistant thermal spray coatings, Plasma Transferred Arc (PTA) cladding and Polymer coatings (in partnership with Plasma Coatings USA and Diamant Metalplastic Germany) are augmented by a host of specialised allied services.

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