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# Thermal spray coatings effective in combating, controlling corrosion

PUBLISHED 01 JUN 12



**THERMAL SPRAYING** Thermal spraying is defined as a group of coating processes in which finely divided feed materials are melted and sprayed on to a surface

The manner in which the surfaces of components interact with each other in a system and within their immediate environment makes them susceptible to corrosion, erosion, abrasion and wear damage.

Through the careful selection of an appropriate thermal spray coating, however, these surfaces can be protected and the service life of the components improved, says thermal spray service provider Thermaspray MD Dr **Jan Lourens**.

“In their natural form, most metals are found in chemical combination with other elements. These metallic ores are refined and formed into metals and

alloys that are widely used in the construction of industrial parts and components,” he says.

The metals and alloys interact with the environment in which they are used and this can lead to the degradation or deterioration commonly referred to as corrosion.

For a metal to be corrosion resistant, it should be able to resist a chemical and/or physical reaction with its surrounding medium. This is dependent on the material, the attacking corrosive medium and the physical and chemical conditions pertaining to it.

Wear damage is collectively known as the progressive removal of material caused by relative movement at the boundary between a solid body and another solid, liquid or gaseous body.

Lourens notes that professionally applied protective thermal spray coatings have proven successful in

inhibiting and controlling costly corrosion and wear damage in parts and components.

“As all these degradation processes are active on the surface of components, it follows that a suitably selected and correctly applied surface coating can be a powerful tool in improving their performance and extending service life,” he says.

Thermal spraying is defined as a group of coating processes in which finely divided metallic or nonmetallic feed materials are melted or heated and then sprayed onto a surface to form a protective coating. This coating may be in the form of a powder, a ceramic rod, wire or molten material.

The coating materials are generally classified as pure metals, metal alloys, ceramics, ceramic metal composites or carbide coatings.

With regard to the applications of coatings, Lourens says the same material can be applied using a different coating process to produce a coating with unique functional properties, such as low or high coefficients of friction, electrical or thermal insulation and nonstick properties, for example.

“Great care should be taken in material and process selection to ensure that the desired functional properties are achieved with a coating.

“At Thermaspray, our coating processes include high-velocity oxyfuel, high-pressure high-velocity oxyfuel, plasma, electric arc, combustion wire and flame spraying. All processes are applied using six-axis robotic gun manipulation to ensure absolute process control and repeatability,” states Lourens.

He adds that the company also offers a range of supporting finishing technologies, including machining, traditional and diamond grinding, finishing and super finishing, as well as crane facilities and part manipulators to handle a variety of different component sizes and geometries.

It offers its products and services to the chemicals and petrochemicals, printing and packaging, pulp and paper, textile, steel and the minerals and minerals processing sectors countrywide.

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