



AMW tests adhesion of thermal spraying layers

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AMW Industry - Antwerpse Motoren Werke - is een mechanisch atelier gespecialiseerd in het vervaardigen en herstellen van onderdelen voor industrie en scheepvaart, naast hardcoating van metalen. De kleine onderneming maakt in opdracht van de grote groepen machineonderdelen, voert herstellingen uit en brengt coatings aan. AMW beschikt hiervoor over een uitgebreid machinepark, voor onder meer conventioneel en numeriek draaien en frezen, kotten, boren, rond? en vlakslijpen en polijsten. Daarnaast is de onderneming een belangrijke speler in de nichemarkt van thermal spray coating, een manier om harde, slijtvaste beschermingslagen aan te brengen op metalen.

Thermal spraying

HVOF (High Velocity Oxygen Fuel) coating is an economically viable procedure to restore a component's surface and to apply hard metallic and ceramic layers. AMW uses a cold process that does not subject the substrate to thermal treatment. AMW uses tungsten carbide-based RAM® coatings to prolong the life cycle of the surfaces of parts, old and new, subject to wear, in areas with heavy erosion or abrasion. RAM hard coatings were developed in the USA and are among the foremost options in the HVOF segment. AMW is the exclusive supplier of these coatings in Europe.



Surface tests

AMW wished to investigate the effect of the condition of steel cylinder surfaces on coating adhesion, and approached Sirris to do so. Thirty-two test samples made of hardened 42CrMo4 and stainless steel sprayed with two types of coating were used to determine the effect of the surface condition on coating adhesion. The sample included various pre-treatment combinations, such as grinding, sandblasting and ageing by means of oxidation, and was then subjected to a metallography and three adhesive tests: a scratch-and-indentation test performed on cross-sections of the sprayed cylinders and a bending test on small flat sheets.

Most of the tests demonstrated that grinding and blasting do not usually have a positive effect on layer adhesion, given that the treatment increases surface roughness and increases the risk of contamination. The tests also showed that oxidation has no effect on layer adhesion.

The tests demonstrated that pre-spraying surface treatment can be eliminated from the procedure with no adverse effect on adhesion, resulting in a simplified maintenance procedure.

Authors