

Hot Corrosion Behaviour of Thermal Spray Coating

By

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CERTIFICATION OF APPROVAL

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Approved by,

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgement, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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ABSTRACT

Hot corrosion is a phenomenon of corrosion or oxidation that will take place at higher operated temperature such as boiler, furnace and others. The thermal spray coating techniques was invented to overcome and increase the life span of substrate metal from hot corrosion. In this report, the author has stated that, the coating powder (chromium carbide- nickel chrome) deposited on the substrate metal using HVOF techniques showed a high corrosion resistance in molten salt solution (sodium sulphate + sodium chloride) at 800 °c for 2 cycles (10 hours). This can be prove by observing and analysis the weight gain of the Sample 1(uncoated) and Sample 2(coated). The weight gain is lower at sample 2 is because, the Sample 2 was been protected with oxide layer that prevent the oxidation to occur at the surface of the substrate metal. The SEM, X-ray Map Analysis, and EDAX analysis has been done to observe the surface profile of samples after the hot corrosion test. Based on the analysis, the images, table and graph that were presented by the analysis, the author conclude that, both of the samples shows the precipitation of oxide layer. The Sample 1 that was bare mild steel shows the deposition of iron oxide and at the Sample 2, chromium oxide, nickel oxide and iron oxide were deposited. The iron oxide layer concentration at Sample 1 was much higher compare to metal oxide that were deposited at Sample 2 and this was the reason of higher weight gain at Sample 1.

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