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**HVOF Sprayed Inconel 718/Cubic Boron Nitride Composite Coatings: Microstructure, Microhardness and Slurry Erosive Behaviour**

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**Abstract**

In the present work Inconel 718 based composite coating with varying cBN were developed on SS304 substrate using high-velocity oxy-fuel (HVOF) technique. The developed coatings were subjected to microstructural, x-ray diffraction, microhardness and adhesion strength studies. The uncoated and composite coatings were subjected to slurry erosion test with varying slurry concentration (10%–40%), slurry rotational speed (500–1500 rpm) and test duration (5–25 h). Cross-sectional analysis of composite coating suggested formation of lamellar structure with good splat/splat bonding as well as with the substrate material. Both microhardness and slurry erosion resistance of Inconel 718/20%cBN coating was found to be significantly higher than that of uncoated and other composite coatings. For all slurry erosion test conditions the composite coatings were found to be superior to that of uncoated substrate. Overall composite coatings showed failure mechanism starting from plastic deformation to spalling while uncoated substrate showed deep crater with heavy ploughing.

**Keywords:**

Composite coatings, microstructure, microhardness, erosive behaviour

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