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Tribological and mechanical behavior of WC-Ni hardfacing using Ni-Cr as interlayer

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One of the most important techniques employed to obtain drilling tools used in oil and mining fields is hardfacing. In this work, the wear resistance and mechanical behavior of WC-Ni hardfacing with Ni-Cr as interlayer are carried out. Oxyacetylene brazing technique is employed to deposit WC-Ni upon the substrate, which is a XC18 steel, whereas, the interlayer Ni-Cr is obtained by thermal spray process. Several studies were done on the characterization of WC in metallic matrix, using different procedures of coating such as, Tungsten Inert Gas (TIG), Laser and HVOF technique. The present work sums up the interlayer influence on the mechanical properties of the coating, and exhibits the decarburization of WC particles caused by the temperature reached during the hardfacing. The WC-Ni behavior is evaluated by tribology tests, using CSM instrument. Wear experiment is performed at room temperature with dry sliding pin-on-disk experiment. While, metallographic examination is done using Scanning Electron microscope (SEM) to exhibit the interfaces and to assess the decarburization of WC particles. Furthermore, hardness profile is performed to evaluate the evolution of mechanical properties across the interfaces.

Biography

Cheniti Billel is a Research Associate at the Metallurgy and Mechanics Division, at the Centre for Scientific and Technical Welding and Control (CSC), Algeria currently working on the project, "Mechanical and Metallurgical properties of multilayer materials made by coating processes and hard facing". His research interests are metallurgy and material chemistry. He has his Bachelor's degree in Materials Engineering and Metallurgy & protection against corrosion at Ecole Nationale Polytechnique of Algiers.

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