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

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**Abstract**: One of the most techniques employed to obtain drilling tools used in oil and mining fields is Hardfacing. In this work, wear resistance and microstructural properties of WC-Ni Hardfacing with Ni-Cr as interlayer are carried out. Oxyacetylene brazing technique is employed to deposit WC-Ni upon XC18 steel substrate. 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 operation. The WC-Ni behavior is evaluate 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 the decarburization of WC particles. Furthermore, hardness profile is evaluated to assess the evolution of mechanical properties across the interfaces.

**Keywords**: Hardfacing, Tungsten carbide, Interface, interlayer, Wear resistance.