

THE EFFECT OF PROCESSING PARAMETERS ON NANOSTRUCTURED $\text{Cr}_3\text{C}_2\text{-Ni20Cr}$ and WC-4Co POWDER AND COATING CHARACTERISTICS

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Abstract

$\text{Cr}_3\text{C}_2\text{-Ni20Cr}$ and WC-Co coatings have been used for corrosion and/or wear resistant applications. In recent years nanostructured coatings of many cermets and composites have exhibited higher hardness and strength. This paper presents the effects of high energy milling parameters on $\text{Cr}_3\text{C}_2\text{-25%Ni20Cr}$ and WC-4%Co powder characteristics as well as the microstructure and mechanical properties of thermal sprayed conventional and nanostructured coatings of these materials. The average particle size and crystallite size of the milled powders decreased with increase in milling time. The nanostructured coatings of both materials were more uniform, significantly harder and had higher fracture toughness compared with coatings prepared with as-received powders.