عنوان مقاله:

Characterization of HVOF Sprayed 75Cr3C2/25(80Ni-20Cr) Coating on 1018 Mild Steel in As-Sprayed and Heat Treated Conditions

محل انتشار:

ششمین کنفرانس بین المللی متالورژی پودر (سال: 1397)

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خلاصه مقاله:

At present work, composite chromium carbide/nickel-chromium powder particles consisting of non-metallic core and uniform layer of nickel alloy were used. Because of good heat- and corrosion-resistance, high hardness and resistance to fretting, abrasion and particle erosion, this type of powder could be appropriate coating material for turbine components and also for hot crushing rolls, forming dies, forging tools, pipes, valves, piston rods. In this work, the Cr3C2/25(80Ni-20Cr) was coated on mild steel via High Velocity Oxy-Fuel (HVOF) process. Due to high impact velocity and relatively low temperature, HVOF could be proper for spraying of wear resistant coatings. To improve weak inter-splats bonding and remove residual thermal stresses induced during coating process, proper heat treatment was performed on coated specimens. To prevent excessive oxidation, decarburization and probable decomposition, the inert gas was used in this stage. The thickness, microstructure, elemental and chemical compositions of coating were characterized using optical microscopy, field emission scanning electron microscopy, energy dispersive X-ray analysis (EDAX), X-ray mapping and X-ray diffraction (XRD). The microhardness of coatings was determined. The E-modulus was also specified by indentation method. The results clearly pointed out that the hardness of heat treated coating significantly decreases due to dominant effect of stress relief. On the other hand, the microstructure indicated improvement on splats bonding after heat treatment.

کلمات کلیدی: