WC-Co coatings for high temperature rocket nozzle applications : an applications note

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Abstrak

High velocity oxy-fuel (HVOF) sprayed tungsten carbide ? cobalt (WC-Co) coatings exhibit attributes that allow them to be a candidate material for high temperature applications; such as temperature insulators for rocket nozzles. This application note investigates the effect of surface preparation, in this case the grit blasting process, on the characteristics of the so-formed coating. The WC-Co coatings exhibited high hardness and low porosity. The composition of WC-Co coating varied in different regions, but on average was close to the composition of the initial feedstock, implying that there was no preferential loss of the material during the spray process.

Microanalysis indicated diffusion of tungsten to the interface between the coating and the substrate and partly explains the high bonding strength of the coating. These physical characteristics suggest that the HVOF sprayed WC-Co is an appropriate coating technology for rocket nozzles.