

## High Temperature Oxidation Resistance of NiCrAl Bond Coat Produced by Spark Plasma Sintering as Thermal Barrier Coatings

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**Abstract :** Thermal barrier coating (TBC) system is used in both aero engines and other gas turbines to offer oxidation protection to superalloy substrate component. In the present work, it shows the ability of a new fabrication technique to develop rapidly new coating composition and microstructure. The compact powders were prepared by Powder Metallurgy method involving powder mixing and the bond coat was synthesized through the application of Spark Plasma Sintering (SPS) at 10500C to produce a fully dense (97%) NiCrAl bulk samples. The influence of sintering temperature on the hardness of NiCrAl, done by Micro Vickers hardness tester, was investigated. And Oxidation test was carried out at 1100oC for 20h, 40h, and 100h. The resulting coat was characterized with optical microscopy, scanning electron microscopy (SEM), energy dispersive x-ray analysis (EDAX) and x-ray diffraction (XRD). Micro XRD analysis after the oxidation test revealed the formation of protective oxides and non-protective oxides.

**Keywords :** high-temperature oxidation, powder metallurgy, spark plasma sintering, thermal barrier coating

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