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Effects of Plastic Deformation on Oxidation Behavior of APS bond coatAbdullah Cahit Karaoglanli¹, Mert Lengerlioğlu¹, Ismail Özdemir²¹Bartın University, Bartın, Turkey ²Bartın University, Bartın, Turkey

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In this study, oxidation behavior of CoNiCrAlY coatings; produced by atmospheric plasma spray (APS) process and APS process followed by shot peening and cold gas dynamic spray (CGDS) process; is investigated. Oxidation tests are conducted isothermally at 1100 °C for 8, 24, 50 and 100 hours periods. Coatings produced by APS process have high porosity and oxide content. In last years, it has been possible to produce coatings with high density, low porosity and oxide content with CGDS process. In CGDS process, unlike thermal spray coatings produced by APS technique, low temperature and plastic deformation is dominant. For this reason, this process makes high quality coating production possible. By applying shot peening process on MCrAlY coatings produced by APS technique, a plastic deformation starting from the surface and compressive stresses have been introduced on this samples. In this study; coatings produced by APS process and APS process followed by shot peening and CGDS process, are compared. This way, effects of plastic deformation on high temperature oxidation behavior on coatings are investigated and evaluated. Characterization studies consist of XRD, SEM, EDX and image analysis and micro hardness tests.

Keywords

Plastic deformation

Shot peening

Oxidation

APS

CGDS