DEVELOPMENT OF BOND COATS FOR EXTENDING LIFETIME OF TBCs

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This talk will be focused to study the MCrAlY bond coat for thermal barrier coating applications. First of all, residual stresses in the bond coat have been measured with use of X-ray diffraction, in which effect of temperature and thermal cycling will be studied. Secondly, rumpling phenomena of such bond coat after thermal treatments have been examined to identify factors affecting the stress evolution and rumpling of the bond coat. Thirdly, effect of the bond coat microstructure on early oxidation of the bond coat has been investigated to understand how the grain size in the bond coat affected both oxidation products and oxidation kinetics. Finally, the comparison of MCrAlY bond coat vs the NiPtAl bond coat will be made in terms of residual stress evolution, residual stresses, and oxidation kinetics to illustrate the effect of these factors on failure and lifetime of TBCs.