

## Accepted Manuscript

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PII: S0925-8388(14)01896-9

DOI: <http://dx.doi.org/10.1016/j.jallcom.2014.08.041>

Reference: JALCOM 31894

To appear in: *Journal of Alloys and Compounds*

Received Date: 21 July 2014

Revised Date: 3 August 2014

Accepted Date: 4 August 2014



Please cite this article as: Z. Xu, J. Dai, J. Niu, N. Li, G. Huang, L. He, Thermal shock behavior of platinum aluminide bond coat/electron beam-physical vapor deposited thermal barrier coatings, *Journal of Alloys and Compounds* (2014), doi: <http://dx.doi.org/10.1016/j.jallcom.2014.08.041>

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**Thermal shock behavior of platinum aluminide bond coat/electron beam-physical vapor deposited thermal barrier coatings**

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**Abstract**

Thermal barrier coating systems (TBCs) including of chemical vapor deposited (Ni, Pt)Al bond coat with grit blasting process and electron beam physical vapor deposited Y<sub>2</sub>O<sub>3</sub>-stabilized-ZrO<sub>2</sub> (YSZ) ceramic coating were investigated. The phase structures, surface and cross-sectional morphologies, thermal shock behaviors and residual stresses of the coatings were studied in detail. Grain boundary ridges still remain on the surface of bond coat prior to the deposition of the ceramic coating, which are shown to be the major sites for spallation damage initiation in TBCs. When these ridges are mostly removed, they appear some of cavities formation and then the damage initiation mode is deteriorated. Damage initiation and progression occurs at the bond coat to thermally grown oxide (TGO) interface leading to a buckling failure behavior. A buckle failure once started may be arrested when it runs into a region of high bond coat to TGO interface toughness. Thus, complete failure

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