

## **PROCESSING AND MICROSTRUCTURE EVOLUTION IN EB-PVD TBCs.**

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### **ABSTRACT**

The connection between processing and performance in thermal barrier coatings produced by electron-beam physical-vapor-deposition is not well understood. A significant component of the problem is the limited understanding of the role that microstructure (including defects) plays in this connection, and the relationships between microstructure and process parameters. This presentation will review recent work aimed at understanding these relationships. The focus will be on the evolution of porosity within the TBC, which is of paramount importance to both thermal conductivity and strain tolerance. Porosity is a result of shadowing processes in the presence of insufficient surface diffusion, and thus deposition temperature and vapor incidence pattern are major parameters. The presentation will highlight the interplay between vapor flux and surface topography, illustrating the relevant phenomena with experimental and modeling results. (Work sponsored by ONR under Grant N00014-99-1-0471 and the UC-LANL Collaborative Research Program.)