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***Development of Thermal Barrier Coatings for Aero Engines Using S-HVOF Process***

**Abstract:**

Electron beam physical vapor deposited (EB-PVD) technique is employed for Thermal barrier coatings (TBCs) in aero engines which require high reliability. However, EB-PVD takes a long lead time due to a very low deposition rate and processing in a vacuum environment. In contrast, suspension spraying techniques can be processed in the air with shorter lead time and tailor unique microstructures such as columnar by EB-PVD. In this study, suspension high velocity oxy-fuel sprayed (S-HVOF) TBCs are compared with EB-PVD and the other spraying techniques in terms of thermal conductivity, spallation life, erosion rate, CMAS penetration and cost. The results of this study could be concluded that S-HVOF is one of the best alternative candidate processes. Furthermore, CMAS resistance was further improved by implementing advanced coating structures, such as dual-layer TBCs incorporating a CMAS-resistant top coat and dense TBCs produced from high-solid-content suspensions.

**Biography:**

Kazuma Takeno is the Ceramics Coating Field Leader at the Research & Innovation Center of Mitsubishi Heavy Industries. He has over ten years of industrial experience in thermal barrier coatings (TBCs). His research expertise includes mechanics of materials, high-temperature strength, and fracture mechanics. He currently leads the development of advanced evaluation techniques for TBCs in high-efficiency gas turbines and the advancement of TBC technologies employing the S-HVOF process for aero-engine applications.