

Editorial



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Ceramic thermal and environmental barrier coatings are used in gas turbine engines to protect engine hot-section components in harsh combustion environments, and extend component lifetimes. For future high performance engines, the development of advanced thermal and environmental barrier coating systems will allow these coatings to be more aggressively used to simultaneously increase engine operating temperature and reduce cooling requirements, thereby leading to significant improvements in engine power density and efficiency. Advanced ceramic coatings for high efficiency and low emission engine applications have demonstrated improved temperature reduction and environmental protection benefits in engine combustion and thermal cyclic environments for metallic and ceramic components.

In order to achieve future engine performance goals, thermal and environmental barrier coatings need to be further developed with increased chemical and microstructural stability at high temperatures, lower thermal conductivity, improved thermal stress and erosion resistance, and desired functionality. This first special issue contains selected papers presented at the Symposium on Thermal and Environmental Barrier Coatings at the 2003 International Thermal Spray Conference (ITSC2003) in Orlando, Florida, May 5-8, 2003, emphasizing novel plasma-sprayed coating developments and the coating performance evaluation.

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