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Thermal and Environmental Barrier Coatings for Advanced Turbine Engine Applications

By Robert A. Miller

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 40 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. Ceramic thermal and environmental barrier coatings (TEBCs) will play a crucial role in advanced gas turbine engine systems because of their ability to significantly increase engine operating temperatures and reduce cooling requirements, thus help achieve engine low emission and high efficiency goals. Advanced TEBCs are being developed for the low emission SiC/SiC ceramic matrix composite (CMC) combustor applications by extending the CMC liner and vane temperature capability to 1650 C (3000 F) in oxidizing and water vapor containing combustion environments. Low conductivity thermal barrier coatings (TBCs) are also being developed for metallic turbine airfoil and combustor applications, providing the component temperature capability up to 1650 C (3000 F). In this paper, ceramic coating development considerations and requirements for both the ceramic and metallic components will be described for engine high temperature and high-heat-flux applications. The underlying coating failure mechanisms and life prediction approaches will be discussed based on the simulated engine tests and fracture mechanics modeling results. This item ships from La Vergne, TN. Paperback.



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