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THERMAL BARRIER COATINGS FOR AIRCRAFT ENGINES—
HISTORY AND DIRECTIONS

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Thin thermal barrier coatings for protecting aircraft turbine section airfoils will be examined. The discussion focusses on those advances that led first to their use for component life extension and more recently as an integral part of airfoil design. It will be noted that development has been driven by laboratory rig and furnace testing corroborated by engine testing and engine field experience. The technology has also been supported by performance modeling to demonstrate benefits and life modeling for mission analysis.

Factors which have led to the selection of the current state-of-the-art plasma sprayed and physical vapor deposited zirconia-yttria/MCrAlY TBCs will be emphasized as will observations fundamentally related to their behavior.

Current directions in research into thermal barrier coatings and recent progress at NASA will also be noted.

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