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Microstructure and Mechanical Behaviour Relationship of Plasma Sprayed Mullit+YSZ Coatings

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The YSZ/mullite composite coatings have been given an impression for improved high temperature resistance over YSZ coatings under severe service conditions and should be investigated further for its possible use in thermal barrier coating (TBC) systems. In this study, a composite thermal barrier coating made from a combination of YSZ and mullite (wt%25 to 50) was investigated. Powders of each powders were mechanically mixed together and then sprayed on superalloy substrates. Microstructure and mechanical behaviour relationship of these composite coatings were investigated. Crystallinity and phase ratios were determined by XRD analysis. Results showed that mullite addition improved the mechanical behaviour of YSZ coating under high temperature conditions.

Keywords
YSZ-Mullite Coating
Plasma Spray
Durability
thermal barrier