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## **SUSPENSION PLASMA SPRAYED THERMAL BARRIER COATINGS**

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Suspension plasma spray has become a promising technique for production of thermal barrier coatings. With the implementation of SPS using high power plasma guns, industrial application has become a reality. Particularly the use of axial feeding of the suspension as a number of drawbacks of radial feeding of the suspension.

Of particular interest in SPS spraying is the ability to generate structures that are difficult or impossible to generate via conventional powder spraying. In particular the formation of segmented or fully columnar coatings is of great interest for TBC applications due to their inherent strain tolerance.

Columnar and segmented SPS coatings have been evaluated along with their conventional APS counterparts in both thermal shock and thermo-cyclic fatigue (TCF) testing. SPS coatings have demonstrated dramatically improved thermal shock performance and long TCF life. Thermal conductivity has been demonstrated to be in-line with or lower than conventional porous APS YSZ coatings and significantly below the dense vertically cracked APS competitor coatings.

Research is continuing into the appropriate bond coat preparation for SPS coatings; particularly as the columnar structured coatings are influenced by the underlying surface topography on which they are deposited.