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# Columnar structured thermal barrier coatings by thermal spray methods

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## **COLUMNAR STRUCTURED THERMAL BARRIER COATINGS BY THERMAL SPRAY METHODS**

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Several new thermal spray methods have been developed which allow the manufacture of columnar, highly strain tolerant thermal barrier coatings. One of the methods is the suspension plasma spraying, in which suspensions of fine, submicron meter powders are injected into the plasma plume. Under specific processing conditions columnar, finely structured coatings develop. Another method is the plasma spray - physical vapour deposition (PS-PVD) process in which powders are not only molten but even evaporated leading to a PVD-like columnar structure. The presentation will first describe the properties of these columnar coatings prepared from yttria stabilized zirconia (YSZ), the standard TBC material and compare these to conventional micro-cracked coatings. Furthermore, results obtained from advanced TBC materials processed by SPS and PS-PVD will be presented.