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Speaker Biography:
Master degree in Aerospace Engineering.
Before joining Turbocoating he worked at Cranfield University.
His research fields are related to metallic and ceramic coating for high-temperature and friction applications.

Abstract:

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Great efforts and research activities have been dedicated to Suspension Plasma Spray (SPS) theme.
This is mainly due to the encouraging performances achieved using YSZ top coat layer in TBC systems for gas turbine applications. Actually, it seems that we are approaching the industrialization launch but different feelings seems to stop it.
In these years, a great interest has been showed from many stakeholders, but no decisive actions have been taken to get this technology into the market.
Despite a great potential, SPS shows some limits such as spray distance and process cost, mainly due to the low deposition rate and raw materials’ cost.
In the other hand, the obtained results encourage to elaborate on SPS spraying capabilities. For this work an industrial set-up was used to investigate the role of critical parameters on coating performances: standoff distance, torch movement speed and surface roughness. Different columnar microstructures were produced using an YSZ ethanol-based suspension. The obtained microstructures were characterized by SEM analysis, x-ray diffraction, bond strength, thermal cycling and jet erosion resistance up to 900 °C.
CMAS attack has been also evaluated and compared with other industrial YSZ coating systems. This work shows an important comparison of cutting edge SPS TBCs with the well-known porous and vertically segmented TBCs in terms of coating performance and industrial feasibility. It was particularly found that, when columns consist of fine, well-flattened and tightly adherent splats, SPS TBCs exhibit better thermal cycling and erosion resistance results compared to APS ones, which reveals extensive interlamellar delamination.
A well stable and performing SPS-based coating has been applied on a real gas-turbine blade. The microstructure has been evaluated to assess the industrial process feasibility.