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LASER DEPOSITION OF COATINGS FOR AERONAUTICAL AND INDUTRIALS TURBINE BLADES

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Zirconium-based ceramic materials are widely employed as Thermal Barrier Coatings (TBC), due to its excellent wear and corrosion resistance at high temperatures. The application of TBC includes aeronautical and industrials turbine blades. The working conditions include oxidizing environments and temperatures above 1000°C. The zirconium-based ceramics are developed in such a way that the microstructural control is possible through the control of chemical composition, fabrication route and, thermal treatment. The present paper proposes a laser route to deposit the TBC coating, where the microstructural control is a function of power density and interaction time between the laser beam and the material. The main objective of this work is to study the influence of the CO2 laser beam (Synrad Evolution 125) parameters: power density and interaction time, on the deposition process of yttria-stabilized zirconia (YSZ) powders on NiCrAlY/AISI 316L substrates. The resulting coating surface and interface were characterized by scanning electron microscopy, energy dispersive spectroscopy and X-ray diffraction. The results indicate that is possible to match laser parameters of scanning speed and intensity to produce homogenous coatings. The X-Ray analyses show that the obtained ceramic coating has reduced number of phases, with prevalence of tetragonal phase.