INSTRUCTIONS TO AUTHORS - EFM²T20

ABSTRACT PREPARATION FORMAT

1) All abstract should be produced in 12 points Times Roman style.
2) For 8 1/2" x 11" (216 mm x 279 mm) paper, the margins should be set at 1" (25 mm) top, bottom, left and right. This leaves a text area 6 1/2" wide and 9" high
3) There should be no cover sheet or title page.
4) Single space all text.

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SAMPLE:

MICROSTRUCTURAL CHARACTERISTICS, CRACK FREQUENCY AND DIFFUSION KINETICS OF FUNCTIONALLY-GRADED TI-AL COMPOSITE COATINGS: EFFECTS OF LASER ENERGY DENSITY (LED).

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Abstract

This study examines the dependence of microstructural characteristics, crack frequency and diffusion kinetics of functionally graded (FGM) titanium aluminide coatings reinforced with TiC on laser energy density (LED). Samples deposited on Ti-6Al-4V substrate via single-step laser cladding (LC) were characterised with optical microscope (OM), scanning electron microscope/energy dispersive X-ray spectroscopy (SEM/EDS) and X-ray diffraction (XRD). LED set at 17.50 J/mm^2 induced a thermo-positive reaction between FGM constituents which resulted in the formation of intermetallic compounds (e.g. Ti_2AlC, γ and α_2 matrix phases) with a microhardness more than that of the substrate and least crack frequency. Variation in microhardness across the layers of sample fabricated with 17.50 J/mm^2 is attributed to diffusion kinetics strongly influenced by laser-materials interactions due to differing chemical composition across its volume. These outcomes provide guidance for future study which engages substrate's pre-heat temperature in eliminating microstructural defects via low cost and time-effective single-step LC process.

Keywords: Functionally graded materials (FGM); Laser cladding (LC); Laser energy density (LED); Titanium aluminide (Ti-Al) composite, X-ray Diffraction (XRD).

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