

Research status of laser cladding on light-weight metal: A review

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ABSTRACT

Laser cladding, a non-contact type thermal energy dependent advanced cladding technology which can be used on a wide range of material surfaces to enhance several tribological properties of the targeted surface. In laser cladding process, which is a surface re-engineering technique, the laser beam is focused on the clad material or superior material, that is spread on an inferior material surface or the target surface. This focused laser beam generates higher amounts of thermal energy that melts the localized clad material and uniformly forms a layer over the substrate material or inferior material. Thus, the surface properties of an inferior material tend to enhance, leading to better applicability of a material. Lot of lighter weight materials have huge structural and biomedical applications. Magnesium being one such low weight: volume ratio material, has its own disadvantages such as, poor corrosion resistance, thus limiting its application. If a proper surface modification technique is employed, increasing the bond strength between clad material and parent material, on these light-weight materials, their applicability can be further improved. The motive for the research on the laser cladding is, advantage that laser beam possesses, i.e. its high accuracy and low Heat Affected Zone (HAZ) area, resulting in precise cladding process. Laser cladding process and its process parameters such as feed rate of clad material, intensity of the laser beam focused, velocity of the laser beam and methods and ways of feeding technique of clad material are discussed in this study. This review paper deals with the explored research areas by several researchers on laser cladding technique.

Keywords: Laser cladding, Clad material, Laser beam and surface modification.

