LASER ASSISTED JOINING OF METALS AND FIBRE-REINFORCED POLYMERS

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Abstract:

Laser Assisted Metal-Polymer Joining Technologies (LAMP) are widely used to create hybrid structures for different purposes. If the laser beam is transported to the connected surfaces from the polymer's side, the polymer has to be adequately transparent on the wavelength of the applied radiation to avoid degradation and to ensure effective and efficient adhesion. The transparency can be affected by the components and the structure of the polymer. The long-term goal of our research is to identify, assess and quantify the connection between the type and the amount of reinforcing fibres and the quality of metal-polymer joining. In this paper we introduce the key findings of first experiments aimed at joining steel and poly(methyl-methacrylate) reinforced with different amounts of cellulose fibres. We identified the optimal values of some laser technology parameters (e.g. power, velocity) that affect the strength and the visual appearance of joining.