TIG torch surfacing of metallic materials - a critical review

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Abstract

This article aims to review and highlight the significant features and development of tungsten inert gas (TIG) torch surfacing of metallic materials. The emphasis is on the surfacing method for metallic materials using a melting processing route. The fusion surfacing methods such as powder injection, wire feed and pre-place powder are elaborated. The comparisons of TIG torch surfacing methods to electron beam welding, laser cladding and thermal spraying are tabulated to give a better understanding of each surfacing method. The application of TIG torch surfacing techniques on various metallic materials is reviewed based on a number of studies from previous researchers. The significance of processing variables of TIG torch surfacing techniques is highlighted with the heat input and welding speed being the most influential factors. This paper also shows the potential application of TIG torch surfacing for the hybridisation of composite coated hard surface layer formation in metallic materials.

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