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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.

Keywords

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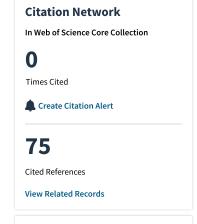
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Effect of carbide dissolution on the corrosion performance of tungsten carbide reinforced Inconel 625 wire laser coating Times Cited: 20 By: Abioye, T. E.; Farayibi, P. K.; McCartney, D. G.; et al. JOURNAL OF MATERIALS PROCESSING TECHNOLOGY Volume: 231 Pages: 89-99 Published: MAY 2016 TIG melted surface modified titanium alloy for cylinder liner application Times Cited: 4 By: Adeleke, S A; Maleque, M A. International Journal of Automotive Engineering and Technologies Volume: 4 Pages: 130-138 Published: 2015 Fabrication and characterization of Al356/SiCp semisolid composites by injecting SiCp containing composite powders Times Cited: 25 By: Amirkhanlou, Sajjad; Niroumand, Behzad JOURNAL OF MATERIALS PROCESSING TECHNOLOGY Volume: 212 Issue: 4 Pages: 841-847 Published: APR 2012 Microstructure evolution and mechanical properties of TIG cladded TiB reinforced composite coating on Ti-6Al-4V alloy Times Cited: 8 By: An, Qi; Huang, Lujun; Jiang, Shan; et al. VACUUM Volume: 145 Pages: 312-319 Published: NOV 2017 Title: [not available] Times Cited: 1 By: Anand, K. R.; Mittal, V. Int. Res. J. Eng. Technol Volume: 4 Pages: 2395-56 Published: 2017 Surface alloying of A2618 aluminum with silicon and iron by TIG process Times Cited: 4 By: Ardeshiri, Alireza; Sohi, Mahmoud Heydarzadeh; Safaei, Abdolghayoom SURFACE & COATINGS TECHNOLOGY Volume: 310 Pages: 87-92 Published: JAN 25 2017 Metal Matrix Composite Coatings Manufactured by Thermal Spraying: Influence of the Powder Preparation on the Coating Times Cited: 3 By: Aussavy, D.; Costil, S.; El Kedim, O.; et al. JOURNAL OF THERMAL SPRAY TECHNOLOGY Volume: 23 Issue: 1-2 Pages: 190-196 Published: JAN 2014 Mechanization of the Grit Blasting Process for Thermal Spray Coating Applications: A Parameter Study Times Cited: 2 By: Begg, Henry; Riley, Melissa; Lovelock, Heidi de Villiers JOURNAL OF THERMAL SPRAY TECHNOLOGY Volume: 25 Issue: 1-2 Pages: 12-20 Published: JAN 2016 Optimization of Hardness Behaviour of TIG Modified Ceramic Coating Using the Taguchi Approach Times Cited: 3 By: Bello, K.A.; Maleque, M.A.; Ahmad, Z.; et al. Advanced Materials Research Volume: 1115 Pages: 238-42 Published: 2015 10. Preparation and characterisation of TIG-alloyed hybrid composite coatings for high-temperature tribological applications Times Cited: 3 By: Bello, K. A.; Maleque, M. A.; Adebisi, A. A.; et al. TRANSACTIONS OF THE INSTITUTE OF METAL FINISHING Volume: 94 Issue: 4 Special Issue: SI Pages: 211-221 Published: 2016 11. Title: [not available] Times Cited: 6 By: Chattopadhyay, R. Green tribology, green surface engineering, and global warming Published: 2014 Publisher: ASM International, Materials Park City, Ohio 12. Effect of brazing current on microstructure and mechanical behavior of WC-Co/AISI 1020 steel TIG brazed joint Times Cited: 5

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