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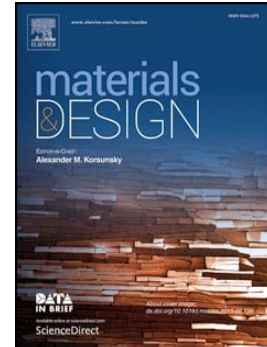
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PII: S0264-1275(16)30919-4  
DOI: doi: [10.1016/j.matdes.2016.07.028](https://doi.org/10.1016/j.matdes.2016.07.028)  
Reference: JMADE 2032

To appear in:

Received date: 2 June 2016  
Revised date: 27 June 2016  
Accepted date: 7 July 2016



Please cite this article as: Jatinder Garg, Kulwant Singh, Slag recycling in submerged arc welding and its effects on the quality of stainless steel claddings, (2016), doi: [10.1016/j.matdes.2016.07.028](https://doi.org/10.1016/j.matdes.2016.07.028)

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# SLAG RECYCLING IN SUBMERGED ARC WELDING AND ITS EFFECTS ON THE QUALITY OF STAINLESS STEEL CLADDINGS

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A novel technology for recycling of slag waste generated during submerged arc cladding of stainless steel (SS) was developed. The claddings produced using “recycled slag” were analysed for their quality and performance during service. The chemical composition of these claddings was found to be within the acceptable range of American Society of Mechanical Engineers (ASME) specifications. Their resistance to various types of corrosion, as determined by conducting different standard emersion and electrochemical tests, was found to be at par with the claddings produced with fresh flux. Results of bend test indicate that these claddings possess good mechanical properties and bond integrity with the substrate at all points. The microstructure examination revealed that both types of claddings (deposited with fresh flux and recycled slag) solidified in same mode of solidification and have similar grain size, shape and phase distribution, in all zones. The microhardness values of the deposited metal, heat affected zone and base metal for both types of cladding are comparable. Ferrite measurements done theoretically as well as practically showed the presence of adequate amount of ferrite to prevent hot fissuring. The cost of recycled slag was calculated and found to be 73% less than the equivalent fresh flux.

**Keywords:** *Weld cladding; Submerged arc welding (SAW); Slag recycling; Stainless steel; Corrosion Testing*

## 1. Introduction

Improving productivity without sacrificing product quality is the major concern of researchers & technologists in today’s competitive world. Stopping, reducing or recycling the

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