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Double Sided Arc Welding of Magnesium Alloys

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Abstract

The recently invented double sided arc welding (DSAW) process may be a technology that can be applied to advantage to the joining of light metal alloys that are increasingly finding use in automotive applications. Previous work at the University of Waterloo has demonstrated the feasibility of using the process, in the butt-joint configuration, to produce tailor-welded presswork blanks from aluminum alloys.
The present work aims to extend the research to using the process to produce butt-joint welds in magnesium alloys.

The research goal is to explore the window of process parameters that can be used to successfully produce these welds, and to optimize the parameters for welding speed and quality. From previous work, it is clear that adequate shielding of the molten weld pool is critical to successful welding of reactive alloys. An attempt is made to augment the degree of shielding provided by commercially available welding torches, through the use of a custom designed attachment.

Experimental welds will be made to enlarge the window of parameters, using the augmented shield design. The welds will be examined to determine their quality with respect to the anticipated problems of hydrogen porosity and other detrimental effects common to welding.