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PII: S0924-0136(17)30595-2
DOI: https://doi.org/10.1016/j.jmatprotec.2017.12.012
Reference: PROTEC 15549

To appear in: *Journal of Materials Processing Technology*

Received date: 23-5-2017
Revised date: 1-12-2017
Accepted date: 8-12-2017

Please cite this article as: Kapil A, Lee T, Vivek A, Bockbrader J, Abke T, Daehn G, Benchmarking strength and fatigue properties of spot impact welds, *Journal of Materials Processing Technology* (2010), https://doi.org/10.1016/j.jmatprotec.2017.12.012

Benchmarking strength and fatigue properties of spot impact welds

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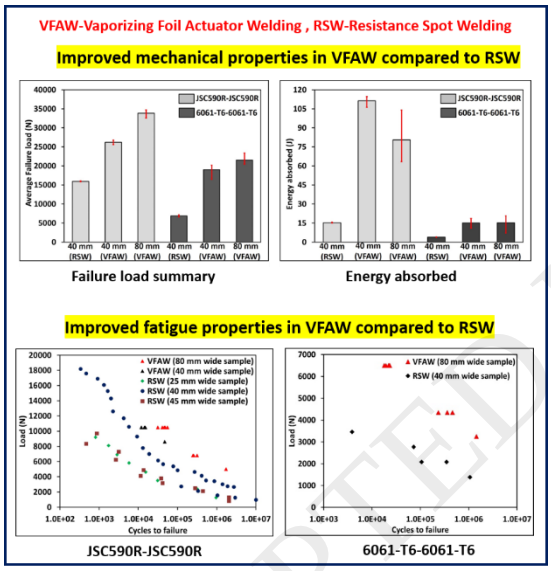
Graphical abstract



Abstract

An adaptation of vaporizing foil actuator welding (VFAW), a solid-state impact welding technique for producing similar JSC590R and 6061-T6 spot-welded joints was used in this study and the mechanical and fatigue properties of the joints were characterized using lap-shear testing, microhardness measurements, optical imaging and fatigue testing and the results compared with those of resistance spot welding (RSW) joints. Results indicated that the VFAW joints had improved strength and energy absorption compared to RSW joints for both the material combinations, however the strength of JSC590R-JSC590R VFAW welds were found to be lower than RSW when corrected for nugget size. Microhardness measurements in VFAW joints showed constant

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