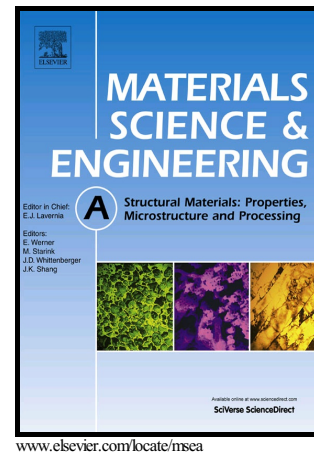


# Author's Accepted Manuscript

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PII: S0921-5093(18)31231-0  
DOI: <https://doi.org/10.1016/j.msea.2018.09.035>  
Reference: MSA36916

To appear in: *Materials Science & Engineering A*

Received date: 21 May 2018  
Revised date: 10 September 2018  
Accepted date: 11 September 2018

Cite this article as: Tianhao Wang, Mageshwari Komarasamy, Kaimiao Liu and Rajiv S. Mishra, Friction stir butt welding of strain-hardened aluminum alloy with high strength steel, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.09.035>

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# Friction stir butt welding of strain-hardened aluminum alloy with high strength steel

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## Abstract

Dissimilar metal joining is challenging because of intermetallic compound (IMC) formation. Solid state welding techniques provide an opportunity. 5083-H116 aluminum alloy and HSLA-65 steel sheets were butt welded by friction stir welding. Joint strength and failure position were determined by IMC thickness and stress concentration at welded interface.

**Keywords:** friction stir welding; dissimilar; high strength steel; stress concentration; digital image correlation

## 1. Introduction

Combination of Al and steel has attracted significant attention because of its great application potential in industry due to light weighting requirements [1-3]. Solid state joining methods such as friction stir welding (FSW) [4], friction welding [5] and hybrid metal extrusion and bonding [6] with lower welding heat input have been favored as compared with conventional fusion welding techniques. Limited chemical reaction and diffusion between Al and steel generally

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