# Accepted Manuscript


Title: High-toughness joining of aluminum alloy 5754 and DQSK steel using hybrid clinching–welding process

Authors: Yu Zhang, Caimei Wang, He Shan, Yang Li, Zhen Luo

PII: S0924-0136(18)30162-6
DOI: https://doi.org/10.1016/j.jmatprotec.2018.04.021
Reference: PROTEC 15721

To appear in: *Journal of Materials Processing Technology*

Received date: 16-11-2017
Revised date: 6-3-2018
Accepted date: 12-4-2018

Please cite this article as: Zhang Y, Wang C, Shan H, Li Y, Luo Z, High-toughness joining of aluminum alloy 5754 and DQSK steel using hybrid clinching–welding process, *Journal of Materials Processing Tech.* (2010), https://doi.org/10.1016/j.jmatprotec.2018.04.021

# High-toughness joining of aluminum alloy 5754 and DQSK steel using hybrid clinching–welding process

Yu Zhang[a, b], Caimei Wang[c], He Shan[a, b], Yang Li[a, b], Zhen Luo[a, b]

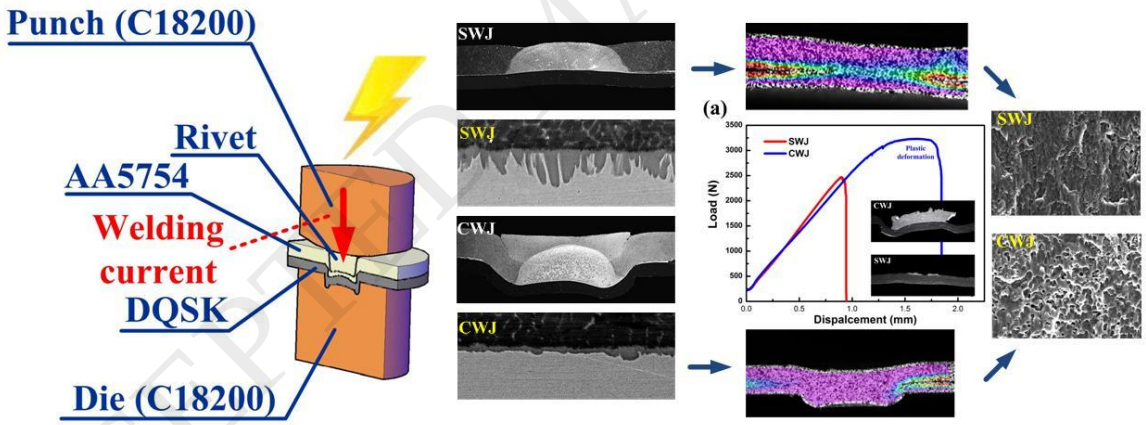
[a]School of Materials Science and Engineering, Tianjin University, Tianjin, 300350, China

[b]Tianjin Key Laboratory of Advanced Joining Technology, Tianjin University, Tianjin 300350, China

[c]State Key Laboratory of Hydraulic Engineering Simulation and Safety, Tianjin University, Tianjin 300072, China

*Corresponding author: Zhen Luo Email: lz_tju@163.com

Graphical abstract




**Abstract**

The spot clinching–welding process proposed in this work involves mechanical clinching and resistance spot welding phases. A 1.5-mm-thick aluminum alloy 5754 sheet was joined with a 0.8-mm-thick drawing-quality special-killed (DQSK) steel sheet by forming a mechanical–metallurgical hybrid joint. The interfacial microstructures were examined using scanning electron microscopy, and digital image