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

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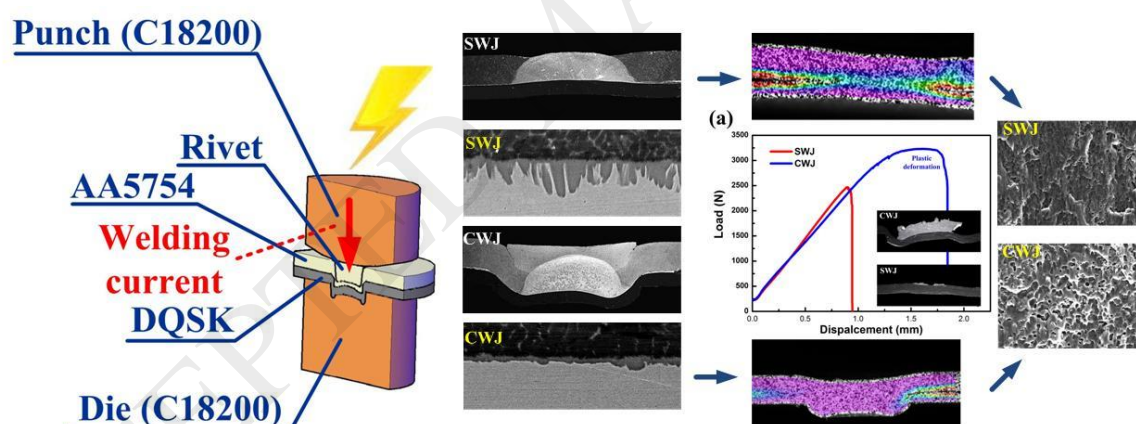
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Graphical abstract



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

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