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Mechanical Properties of Dissimilar Thickness Aluminium Alloy weld by Single/Double Pass FSW

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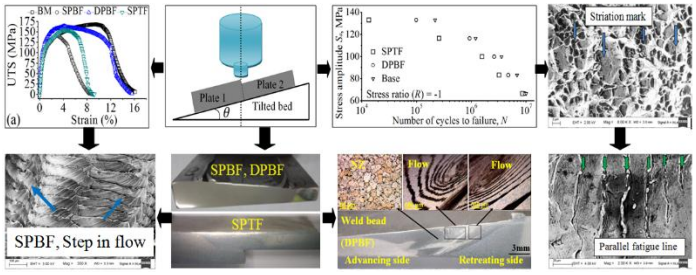
Graphical abstract



Abstract: To address the challenges of joining of dissimilar thickness plates, single pass bottom flat (SPBF), single pass top flat (SPTF) and double pass bottom flat (DPBF) joint configurations were investigated for improvement of weld qualities in friction stir welding. The tensile strength, yield strength and percentage of elongation of the specimen welded by DPBF configuration was 99% of base material (BM). Flexural strength and bending angle were 95% and 100%, respectively, to the BM. Drop weight impact test revealed impact energy absorbed by DPBF welded specimen is comparable with the BM and it was highest at tool rotational speed of 1100 rev/min. The fatigue life at lower stress amplitude was similar as BM but differed at higher stress. The hardness of the