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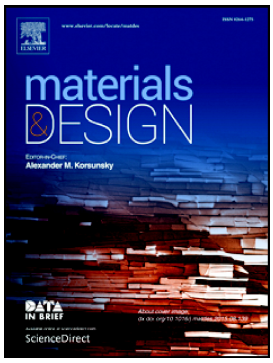

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Joining aluminum alloy 5052 sheets via novel hybrid resistance spot clinching process

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Abstract: Aluminum alloy 5052 sheets (thickness: 1 mm) were joined using a novel method (resistance spot clinching) that combines mechanical clinching and resistance spot welding processes. A pair of molds combine with processing tapes were exerted in this process. The microstructure of the fusion zone under novel process presents more portion of equiaxed dendritic zone compared with that of the resistance spot welded joint, which is due to the different temperature gradient feature during solidification. The mechanical properties of the joints were evaluated via orthogonal trials of tensile shear tests performed on the joints. The results revealed that, even under lower heat input, the load-bearing capacity of the resistance spot clinching joints is superior to that of the traditional resistance spot welding joints. Digital image correlation was used to evaluate the distortion behavior of the weld joints during testing. Compared with the

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