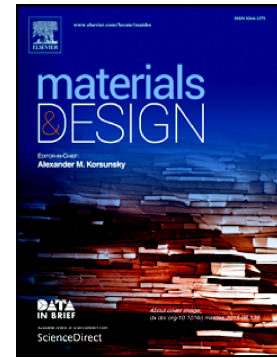


## Accepted Manuscript

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PII: S0264-1275(18)30754-8  
DOI: [doi:10.1016/j.matdes.2018.09.052](https://doi.org/10.1016/j.matdes.2018.09.052)  
Reference: JMADE 7413  
To appear in: *Materials & Design*  
Received date: 13 August 2018  
Revised date: 18 September 2018  
Accepted date: 29 September 2018

Please cite this article as: K. Paveebunvipak, V. Uthaisangsuk , Microstructure based modeling of deformation and failure of spot-welded advanced high strength steels sheets. *Jmade* (2018), doi:[10.1016/j.matdes.2018.09.052](https://doi.org/10.1016/j.matdes.2018.09.052)

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# Microstructure based modeling of deformation and failure of spot-welded advanced high strength steels sheets

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## **Abstract**

Microstructures and hardness of different weld zones of spot-welded high strength steel grade 1000 and press-hardened 22MnB5 steel were characterized. Tensile shear and cross tension test of welded specimens were conducted, in which load responses and fracture developments were identified. Then, samples with microstructures of each weld zone in all examined joints were generated by specific heat treatment processes. 2D representative volume elements (RVEs) for these microstructures were modelled. Flow stress curves of the individual phases were described by micromechanics based models under consideration of local chemical compositions and phase constituents. It was clearly shown that predicted overall stress-strain responses of all weld regions were well in accordance with the tensile test results of

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