Microstructure and Hardness Distribution of Resistance Welded Advanced High Strength Steels - DTU Orbit (31/12/2018)

Microstructure and Hardness Distribution of Resistance Welded Advanced High Strength Steels. In: W. Zhang (Edtr.): In this work a low carbon steel and two high strength steels (DP600 and TRIP700) have been resistance lap welded and the hardness profiles were measured by micro hardness indentation of cross sections of the joint. The resulting microstructure of the weld zone of the DP-DP and TRIP-TRIP joints were found to consist of a martensitic structure with a significant increase in hardness. Joints of dissimilar materials mixed completely in the melted region forming a new alloy with a hardness profile lying in between the hardness measured in joints of the similar materials. Furthermore the joints were simulated numerically and together with the material carbon equivalent, austenization temperatures and the thermal history the simulations were used to estimate the resulting post weld hardness using the commercial FE code SORPAS. The hardness of the welds of dissimilar materials was estimated with a function of the volume weighted compositions of the materials.

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