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Resistance Spot Welding on Patch welded Blanks with adaptive welding control

Lara, J.C.(1); Nizes, A.D.C.(2); Marcelo, L.A.(1); Rossi, J.L.(3); Mucsi, C.S.(1);
(1) IPEN; (2) TK; (3) IPEN - CNEN/SP;

Increasing automotive safety and energy efficiency have become the biggest concerns of the automotive industry in recent years. The advanced high strength steel (AHSS) is chosen for the weight reduction and high mechanical strength for the body in white (BIW) safe cage. The 22MnB5 press hardening type steel (PHS) patchweld technology allows to obtaining a reinforcements and structural parts with one die stamping stroke during hot forming. In the present study, adaptive resistance spot welding control was using to keep consistent spot welding diameter. The resistance spot welding was evaluated using microhardness, tensile test and residual stress measurements. The results showed that the 22MnB5 steel with galvanized coating as received consisted of ferrite and perlite after the resistance spot welding the fusion zone (FZ) has a lath martensitic structure with higher hardness. The resistance spot welding showed a tensile strength reduction and compression residual stress at the surface of the spot welding.