Analysis of properties laser welded Trip steel sheets

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Both, the ecological production and operation of vehicles demand using such materials for deformation zones' structural parts, which show some specific properties and innovative technologies to process them. Specific requirements for functionality (strength, stiffness, deformation work, fatigue properties) are closely linked to processability (formability). In the paper are presented results for multiphase steel Trip RAK40/70 when welded by pulse solid-state fiber laser YLS-500. Based on microstructure analysis in the fusion zone and heat affected zone the welding parameters were optimised. The influence of laser welding on the strength and deformation properties was verified by characteristics of strength, stiffness and deformation work, as they were calculated from mechanical properties measured by tensile test and three-point bending test. The knowledge gathered in the field of laser welding influence on the strength and deformation properties of multiphase steel Trip RAK40/70 should help to designers when design the lightweight structural parts of the car body.

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