

## **Influence of welding parameters on the microstructure and properties of laser welds of duplex steels**

Maroš Martinkovič, Pavel Kovačócy, and Beáta Šimeková

*Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Ulica Jána Bottu č. 2781/25, 917 24 Trnava, Slovakia*

Duplex stainless steels are dual-phase alloys consisting of austenitic and ferritic phases in the microstructure which provide an ideal compromise between mechanical properties and corrosion resistance. Welding of DSS leads to a change of the microstructure and properties in weld joints. An innovative method of laser welding applying a dual beam was used. By spreading the energy of the laser beam over two spots, additional heat is introduced into the weld, which ensures a slowdown in the cooling rate during the welding process. The influence of laser focussing to microstructure and mechanical properties of the weld joints was monitored. Energy distribution of the dual beam was 50:50, total weld energy was constant. Using quantitative metallography ferrite/austenite ratio in fusion zone was determined. Mechanical properties of the welded joint were characterized by determination of shear strength and by the toughness in a fusion zone. For exact determination of the maximum value of the pressure force sensor must be calibrated.

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