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MICROSTRUCTURAL CHANGES ARISEN BY INTERACTION OF PICOSECOND LASER WITH AUSTENITIC MATERIALS

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Investigation was carried out on austenitic material samples – stainless steel and iron base superalloy that are widely used at elevated temperatures and pressures. The samples were exposed to Nd:YAG pulsed laser, with wavelength of 1064nm and pulse duration of 170 ps. Different pulse energy and number of pulses were applied. Spots obtained by laser interaction were observed by optical and scanning electron microscope and analyzed by energo-dispersive spectroscopy. Vickers microhardness tests were performed. In this paper, the microstructural changes, arisen by different pulse energy and number of pulses, were discussed with the aim to determine optimal laser parameters in surface treatment process.

P.S.B.52.

MICROSTRUCTURE AND PROPERTIES OF CMnSiMo STEEL UPON Q-P PROCESS

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An excellent combination of tensile strength and elongation is the most important factor in design of new heat treatment procedures of low alloyed steels. Among advanced heat treatment processes capable of reaching this goal there is also the Q-P process (Quenching and Partitioning), where the final material properties are given through combination of martensite and very fine retained austenite. Experiments with CMnSiMo steel with enhanced molybdenum content have been performed. Considering the fact that molybdenum leads to stabilizing of austenite and deceleration of precipitation kinetics, this alloying concept is expected to bring very good mechanical properties. The paper is aimed at testing the influence of the Q-P process on evolution of final microstructure and mechanical properties of the CMnSiMo steel.