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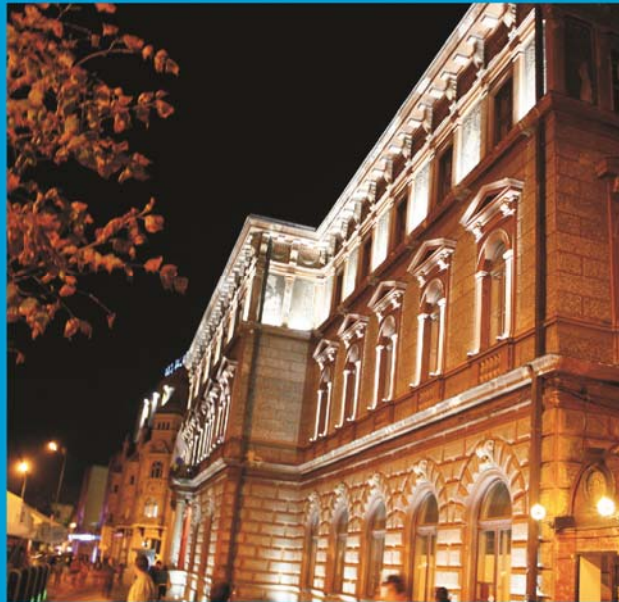


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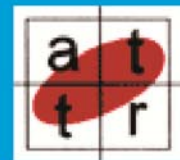
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BOOK OF ABSTRACTS



Association of Heat Treatment
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Book of Abstract

INTERNATIONAL CONFERENCE ON MATERIAL SCIENCE AND ENGINEERING

Section 4: Advanced Welding Eco-Technologies

(the papers are shown in presentation order - lucrările sunt afisate în ordinea prezentării)

A brief description of the research department D12 – Advanced welding eco-technologies

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Characterization of friction stir welded joints of AA 2024-T351 – native vs. treated by laser shock processing

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Structural heterogeneities vs. overall mechanical performance of dissimilar laser hybrid welded joints

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Effect of the filler metals on aluminum alloy joints

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Influence on chemical composition of FeCrAl alloys on the microhardness

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Researches regarding the influence of the technological parameters on the efficiency of the metal melts alloying process by pulverulent material injection

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Special filler materials for welding reconditioning of cutting and deformation tools

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IV.O.1.

CHARACTERIZATION OF FRICTION STIR WELDED JOINTS OF AA 2024-T351 – NATIVE VS. TREATED BY LASER SHOCK PROCESSING

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ABSTRACT

The paper presents a consistent set of results showing the ability of Laser Shock Processing (LSP) in modifying the overall properties of the Friction Stir Welded (FSW) joints made of AA 2024-T351. Based on laser beam intensities above 109 W/cm^2 with pulse energies of several Joules and pulses durations of nanoseconds, LSP is able of inducing a compression residual stress field, improving the wear and fatigue resistance by slowing crack propagation and stress corrosion cracking, but also improving the overall behaviour of the structure. After the FSW and LSP procedures are briefly presented, the results of micro-hardness measurements and of transverse tensile tests, together with the corrosion resistance of the native joints vs. LSP treated are discussed. The ability of LSP to generate compressive residual stresses and to improve the behaviour of the FSW joints is underscored.

Keywords: Friction Stir Welding, Laser Shock Processing, microstructure, hardness, stress corrosion