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*We wish
a Merry Christmas
and a Happy New Year
to all the Readers, Authors and Co-workers*

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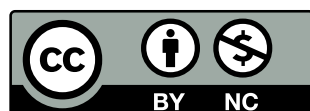
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Summaries of the articles

J. Dworak – Laser Overlay Welding of Graded Layers

Graded materials are increasingly commonly used as structural materials in many advanced engineering structures. These materials are usually characterised by the gradual change of a specific functional parameter, usually in the direction of thickness. The article presents the general characteristics of graded metals and their manufacturing methods. On the basis of selected results of author's own research it was possible to determine the possibility of making graded layers using powder-based laser overlay welding.

L. Tuz, K. Pańcikiewicz, E. Tasak, J. Adamiec, T. Góral - Evaluation of Selected Austenitic Stainless Steels Hot Crack Susceptibility

The article presents the results concerning hot crack susceptibility of selected steels having an austenitic structure. The tests were based on the analysis of the chemical composition of these steels and utilising special stations for the Transvarestraint tests and the Blanchet method. During the tests it was possible to observe cracks in the liquid-solid area. The results obtained indicate the existence of an area free from solidification cracks for a certain strain value at a pre-set welding rate. It was also possible to observe the absence of a distinct boundary between such areas, which was reflected in the crack length.

J. Piķuła, K. Kwieciński, G. Porembski, A. Pietras - FEM Simulation of Check Valve Ball FSW Process

The article presents results of the FEM simulation involving friction stir welding (FSW) of check valve ball elements. The tests involved the obtainment of temperature fields, information about stresses and displacements during the

process and about residual stresses and strains following the cooling of elements welded. The knowledge obtained concerning process thermal conditions and that concerning the field of stresses and strains was used to design clamps of a station intended for welding check valve ball elements.

R. Kaczmarek, R. Krawczyk – Analysis of Beveling Angle Effect on Incomplete Side Fusion Detectability in Ultrasonic Non-Destructive Testing Method

The article presents the analysis of guidelines contained in PN-EN ISO 17640 related to ultrasonic tests of welded joints with reference to adjusting the angle of beam insertion into a weld fusion line as well as the results of tests investigating the beveling angle effect on the amplitude of echo bounced off the bevelled surface simulating the echo bounced off incomplete side fusions. The tests were conducted using a MWB70-4 probe and three specimens bevelled at angles of 20°, 25° and 30°. The article discusses the selection of a beam insertion angle on the detectability of flat discontinuities located on the weld fusion line, inclusive of incomplete side fusions. The article is addressed to NDT personnel, in particular to workers performing ultrasonic testing of welded joints.

A. Sawicki, M. Haltof – Testing the Effect of Column Length Disturbances on the Method used for Determining the Pentegov Model Describing the Electric Arc of the Ayrton Type Static Characteristics

The research involved the determination of physical factors affecting the generation of arc column length disturbances in electrotechnological devices. The article contains a justification related to the selection of the Pentegov

model for representing the dynamic characteristics of a sinusoidal current powered arc. The research also included the modification of the Ayrton formula approximating static voltage-current characteristics by taking into consideration arc column length random disturbances as well as the development of an arc

macro-model and simulations of processes in a simple circuit using MATLAB-Simulink software. The research demonstrated the efficiency of the three measurement method for determining the Pentegov model parameters in conditions arc column length disturbances.

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