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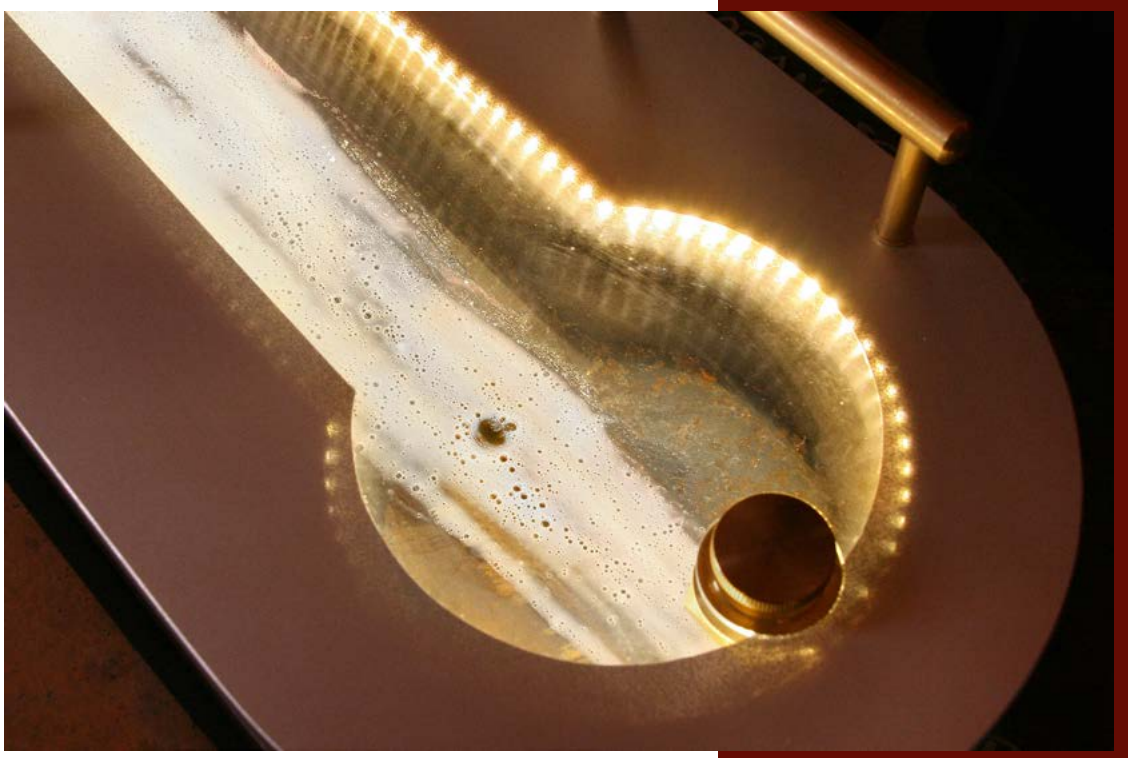

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CONTENTS

INSTITUTE OF WELDING

The International Institute of Welding
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Joining and Cutting member

Summaries of the articles

J. Matusiak, J. Wyciślik – Assessment of fume and chemical hazard in work environment during welding and braze welding of various construction materials by innovative methods

It has been presented selected results of investigations oriented on identification, analysis and assessment of fume and chemical hazard which occur during application of innovative methods of joining various construction materials as well as on disclosure of the possibility of optimization of these methods in respect of the improvement in work conditions and the increase in work safety during fabrication of welded structures in different industrial branches. The results of the project "Assessment of fume and chemical hazard in work environment during joining various construction materials by innovative methods as the action supporting the formation of safe work conditions" executed under the Long-term National Programme "Improvement in safety and work conditions" have been given as well.

St. Marzec, J. Matusiak, J. Nowicka, J. Wyciślik - Optical radiation in welding and braze welding by CMT and ColdArc methods

It has been presented results of measurements of UV and IR radiation and the radiance of visible light during welding of X5CrNi18-10 chromium-nickel austenitic steel and X6Cr17 chromium ferritic steel by CMT and ColdArc methods as well as during braze welding of DX 54D and DP600X steels covered with protective layer of pure zinc or zinc-iron alloy. It has been shown that the optical radiation intensity increases together with the increase of welding current and arc voltage. Moreover, the radiation intensity is affected by welding/braze welding methods and the kind of shielding gases whereas the influence of parent materials kind is difficult to assess.

M. Łomozik - Creep-resisting structural steels for the power industry - the past and the present time

The article provides information about the condition of domestic and global power industries in the context of the thermal efficiency of existing power systems. The work also presents the tendencies of the development of power systems operating at supercritical steam parameters. The article shows basic requirements for advanced structural materials intended for use in power industry machinery and also presents diagrams showing the development of successive creep-resisting steel generations with a ferritic base and of austenitic steels. The article provides approximate chemical compositions of selected steels from individual groups differing in chromium content. Attention is also given to the dependence of welding process technological parameters for joining steels designed for higher temperatures on the chemical composition of the steels and the thickness of components being welded. The conclusion contains a statement that the continuous introduction of new steel grades on the market is accompanied by the continuous use of steels belonging to older generation grades such as steels of 13CrMo4-5 and 10CrMo9-10 grades

M. St. Węglowski, Y. M. Zhang - Usability of welding arc electromagnetic radiation in diagnostics of MAG welding processes

The study presents ideas and test results related to an unconventional method of MAG welding process monitoring making use of welding arc radiation in the visible range. The experiments conducted indicate the direction of further research on the phenomenon of welding arc radiation and the possibilities of using it for on-line monitoring of other welding processes. The recording of spectral distribution was made using a spectrophotometric card. The stability of a welding process was assessed using the least squares method. The recorded signals were modelled using polynomials and the optimum polynomial order was selected using the F-test method. The study presents the impact of welding current intensity and of a filler metal type on the distribution of a welding arc visible radiation spectrum.

A. Świerczyńska – The influence of technological factors on diffusible hydrogen content in rutile flux-cored wires weld deposit

The presence of diffusible hydrogen is one of the conditions for generation of cold cracks in welded joints and contributes to their porosity. In the work it was attempted to determine the gravity of selected technological factors in formation of diffusible hydrogen

in weld metal what would make possible to forecast its content through changes of welding parameters. The statistical analysis of experimental results gathered during literature survey referring to the considered issue enabled to assess the gravity of the impact of seven factors on the amount of diffusible hydrogen in weld deposit of H10 class rutile flux-cored wire and to develop for them three forms of statistical models.

J. Czuchryj, A. Pilarczyk – Inspection of welded joints leaktightness by means of bubble test with vacuum cup

Testing of leaktightness of welded joints with the use of bubble test with vacuum cup and the principles of such a testing by means of the UKS device have been characterized. It has been presented also the UKS device design and the requirements concerning such an inspection. The UKS device satisfies the requirements specified in the PN – EN 1779 and PN – EN 1593 standards.

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