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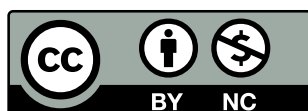
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INSTITUTE OF WELDING

The International Institute of Welding
and The European Federation for Welding,
Joining and Cutting member



Summaries of the articles

M. Restecka – IT Systems in Aid of Welding Processes

DOI: [10.17729/ebis.2015.3/1](https://doi.org/10.17729/ebis.2015.3/1)

The organisation of work and proper control both of technical and economic process parameters increase productivity. Success is preconditioned by the possibility of quickly adapting a technological process to an ever-changing market situation. The article presents various IT programmes supporting the management, planning, designing and preparing of production, monitoring technological processes and analysing obtained data in an appropriate way.

L. Szubert – ArcWeld Multi-Station System for Controlling Welding Parameters

DOI: [10.17729/ebis.2015.3/2](https://doi.org/10.17729/ebis.2015.3/2)

Progressing automation and strong market competition dictate a rise in productivity without compromising, and sometimes even with increasing quality-related requirements. As a result, in big industrial companies the control of production processes based on traditional inspection methods is significantly limited, expensive and impossible to perform on a continuous basis. Consequently, a quality control related to welded joints is randomised and based on destructive testing. Although such welded joint quality control enables obtaining very good results in terms of joint quality control, its cost, time and possibility of assessing only a selected set of specimens make the method impossible for performing complex assessments of ongoing production processes. This has led to a rising popularity of methods supporting the evaluation of joint quality control enabling a non-invasive assessment of each joint. To this end it has become necessary to apply systems making it possible to continuously control electric parameters characterising welding processes. For many years,

Institut Spawalnictwa has been carrying out tests and developing measurement equipment for monitoring welding processes. Such equipment and systems find applications in industrial companies, both for welding process control and assessment as well as for adjusting welding process parameters. One of such systems is a multi-station system for monitoring Arc Weld (electric arc welding) process parameters.

A. Pilarczyk – Instytut Spawalnictwa Computer Welding Platform (ISCWP)

DOI: [10.17729/ebis.2015.3/3](https://doi.org/10.17729/ebis.2015.3/3)

The article presents stages dedicated to creating, developing and implementing an integrated IT solution of Instytut Spawalnictwa, i.e. Computer Welding Platform (ISCWP). A Computer-Aided Welding Personnel Management System, being one of IWP modules, has introduced a new standard of information exchange in the system of personnel training and certification. The article also describes the remaining IWP modules, i.e. Welding Engineer Website and Knowledge Base. These modules enable collecting and sharing information related to the research potential of domestic and overseas research establishments as well as to innovative technological solutions developed in such establishments. All the modules make up a modern system of communication between innovators and users of welding technologies. Due to Internet-based solutions, Computer Welding Platform can be accessed at any time from any place in the world.

J. Czuchryj, S. Sikora – Problems Related to the Organisation of a Laboratory for Non-Destructive Testing and Selected Destructive Tests

DOI: [10.17729/ebis.2015.3/4](https://doi.org/10.17729/ebis.2015.3/4)

Increasing demands for NDT services trigger organising and opening laboratories

specialising in such testing and provided with necessary equipment. This was the reason for the determination of testing means and costs necessary for performing NDT activities. Information collected and presented in this article should optimise the creation of a laboratory in terms of necessary equipment and investment costs.

R. Kaczmarek, R. Krawczyk – Testing Echo Amplitude Changes Depending on an Ultrasonic Beam Angle of Incidence on an Infinite Reflector

DOI: [10.17729/ebis.2015.3/5](https://doi.org/10.17729/ebis.2015.3/5)

The article presents test results related to the detectability of flat discontinuities depending on their orientation in relation to the axis of an ultrasonic wave beam. A flat discontinuity used in the tests was the skew surface of a DGS standard, being an infinite reflector for an ultrasonic wave. The tests were performed using a phased array transducer and a defectoscope with a Phased Array imaging package enabling the determination of echo amplitude for various beam insertion angle values. As a result, it was possible to obtain the characteristics of a decibel echo drop depending on a beam angle of incidence on a reflector in a range from the optimum to a disadvantageous value. The article also contains the analysis of the effect of a determined characteristic on the detectability of flat discontinuities in conventional ultrasonic tests as well as discusses manners making it possible to increase the detectability of flat discontinuities. First of all, the article is addressed at NDT personnel, particularly at persons dealing with ultrasonic tests of welded joints.

M. Grupp, T. Westphälin, G. Chrobak – Fibre Laser as an Energy-Saving Tool. Overview of Industrial Applications

DOI: [10.17729/ebis.2015.3/6](https://doi.org/10.17729/ebis.2015.3/6)

Fibre lasers have established their position in a variety of industrial applications. The advantages of these lasers such as excellent beam

quality, solid (compact) design and possibility of power adjustment within a wide range have supplanted conventional laser sources in a number of applications or made laser technologies applicable in some areas for the first time ever. Their electric efficiency (up to approximately 45%) make fibre lasers energy-saving tools, minimising outlays and costs related to power consumption and cooling. The article describes fibre laser technologies and overviews micro- and macro-processing applications using pulsed-mode lasers or lasers emitting a continuous single (basic mode) beam or a multi-mode beam.

A. Sawicki, M. Haltof – Method for Determining the Parameters of the Pentegov Model Describing an Electric Arc with Hyperbolic-Linear Static Characteristic

DOI: [10.17729/ebis.2015.3/7](https://doi.org/10.17729/ebis.2015.3/7)

The article presents reasons for nonlinear static voltage-current characteristics of an electric arc; the characteristics consist of an initial voltage drop followed by a voltage rise in the range of strong currents. The article suggests that overcoming difficulties in mathematical modelling of electric processes in circuits with arcs requires the use of Pentegov assumptions and the building of an arc model utilising a static hyperbolic-linear characteristic. The article also presents a method for the experimental determination of arc model parameters with sinusoidal excitation as well as describes a macromodel built using the MATLAB-Simulink programme. The correctness of analytical expressions specifying mathematical model parameters was verified through simulation. The study also involved testing the resistance of the proposed method to arc length random disturbances.

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