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CONTENTS

INSTITUTE OF WELDING

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

J. Dworak - Impact of laser beam shape on YAG pulsed laser welding

The study presents the general characteristic of laser welding with a radiation beam emitted in the pulsed mode and explains the characteristics of the energy-related parameters of a pulsed radiation beam. The text indicates the shape of a pulse (specific course of power changes within the duration of a pulse) as one of the parameters of a laser beam influencing the process of welding, particularly of thin precise elements. Examples of penetrations and welded joints were used to illustrate the possibility of changing the shape of a weld and the manner of weld metal crystallisation by applying laser beam pulses of diversified shapes.

A. Sawicki - Modified Habedank and TWV hybrid models of the arc with variable length for simulating processes in electrical devices

The paper indicates main difficulties in determination of characteristics and mathematical modelling of the electric arc. Limitations in practical use of the simplified and combined models of discharge with constant plasma column length have been pointed out. New plasma column models with variable arc length have been presented. The models consist of series or parallel connected elements corresponding to the modified Cassie-Berger and Mayr-Kulakov ones.

E. Turyk, A. Żydzik-Białek, M. Bormann, A. Jastrzębiowski, M. Kościelniak, T. Kuzio, B. Czwórnóg -Repair welding of elements of the sign "ARBEIT MACHT FREI" of the main gate to the former German Nazi concentration and extermination camp Auschwitz I

The article presents theft-accompanying damage to the sign "ARBEIT MACHT FREI" and discusses the requirements of the Conservation Section of the Auschwitz-Birkenau State Museum related to the joining of the sign elements and the extent of conservation performed. The study also covers the process and results of the work regarding the technology of the repair welding of the sign carried out at Instytut Spawalnictwa and addresses the issue of welding-related technological supervision.

A. Kiszka, T. Pfeifer - Variable polarity MAG welding of thin protective-coated steel plates

The study presents results of research on the application and usability of variable polarity MAG welding of thin protective-coated sheets in automotive industry. The research-related process was carried out using OTC Daihen DW 300 and Cloos Qineo Champ welding devices. The study also discusses the influence of EN ratio in the course of current and voltage on the stability of process, quality of joints, and the degree of damage to protective coating.

M. St. Węglowski - Testing electromagnetic radiation of welding arc in TIG method from welding process monitoring point of view

The study presents the results of tests of welding arc electromagnetic radiation in TIG method. Within the research it was necessary to carry out an extensive overview of reference publications about arc radiation and applied testing methods. Taking advantage of an arc model in TIG method described in reference publications it was possible to determine a dependence of welding current intensity and welding arc length on the intensity of welding

arc visible radiation. The research-related tests made it possible to determine new parameter values in the generalised arc model for a 2÷5-mm range of welding arc length, which resulted in better matching of a model. It was also possible to demonstrate that an increase in welding current intensity for a constant length of a welding arc causes an increase in the intensity of arc visible radiation and that the same effect can be obtained by increasing an arc length at constant welding current intensity. The research also led to a conclusion that the monitoring of welding arc visible radiation in TIG method can be used for controlling an arc length.

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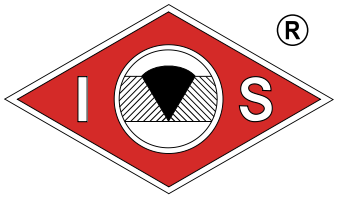
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