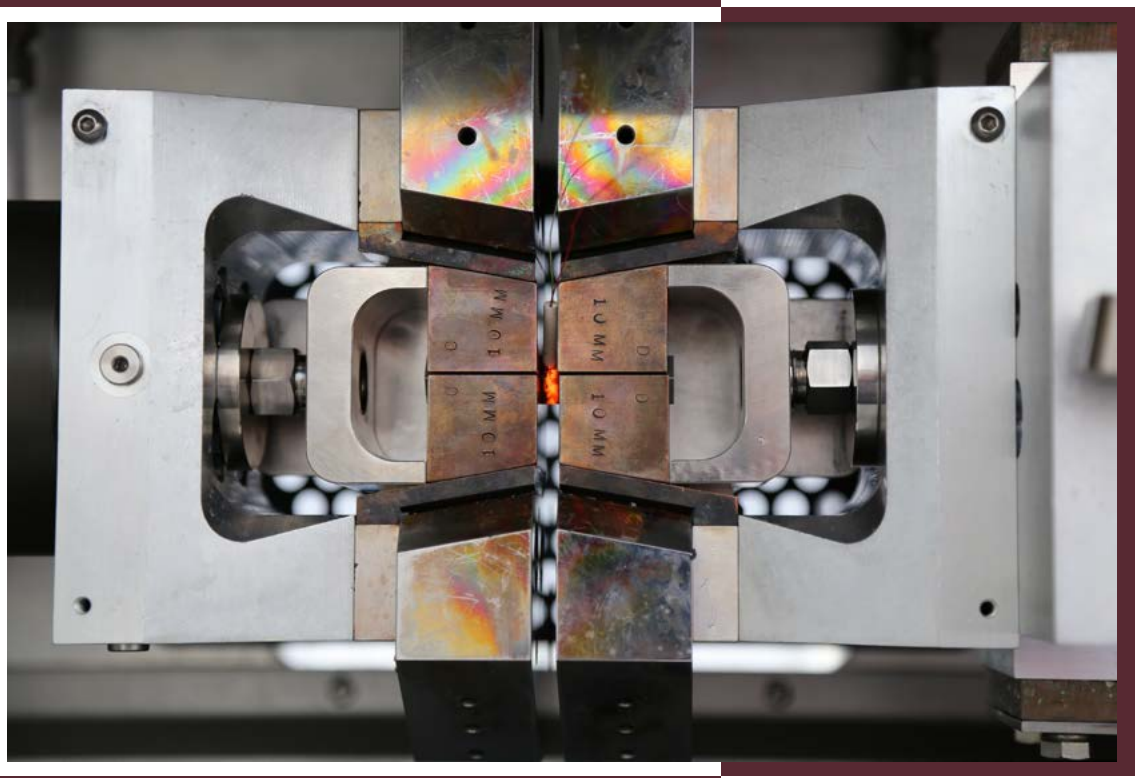
ISSN 2300-1674

BIULETYN
INSTYTUTU SPAWALNICTWA



No. 3/2016

INSTITUTE OF WELDING BULLETIN

BIULETYN INSTYTUTU SPAWALNICTWA

No. 3 BIMONTHLY Volume 60

CONTENTS

INSTITUTE OF WELDING

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

Summaries of the articles

J. Czuchryj – Methodology of Assessing the Quality of Surfaced Layers on the Basis of Internal Welding Imperfections

DOI: *10.17729/ebis.2016.3/1*

In manufactured or refurbished machinery parts, surfaced layers are often characterised by the presence of welding imperfections, usually reducing the active life of equipment and machinery. The development of an appropriate methodology and the specification of assessment criteria concerning the quality of surfaced layers could facilitate the assessment of surfaced elements in relation to their load transferring capability. The article describes tests involving specimens surfaced using various methods, proposes a methodology of testing the quality of overlay welds on the basis of macroscopic observations and specifies criteria to be applied when assessing the above named quality on the basis of established dependences.

P. Irek, Ł. Rawicki, K. Kaczmarek – Dye Penetrant Testing of Welded Joints Made of Aluminium and its Alloys

DOI: *10.17729/ebis.2016.3/2*

The article presents welding imperfections, particularly the most dangerous of them, i.e. cracks, tested using the penetrant method. The tests involved making natural cracks in aluminium alloy AlSi1MgMn. Afterwards, the width of cracks and the profile of roughness were measured. The investigation also involved a series of penetrant tests performed in order to observe how a given factor (crack width, crack surface roughness) affects development times in penetrant tests involving joints made of aluminium and its alloys. The article also presents the determined development time recommended for aluminium and its alloys in order to detect indications originated in cracks as well as analyses penetration times in penetrant tests.

J. Pikuła, K. Kwieciński, G. Porembski, A. Pietras - FEM Simulation of the FSW Process of Heat Exchanger Components

DOI: *10.17729/ebis.2016.3/3*

The paper presents results of the FEM simulation of Fsw process. The object of the research was a heat exchanger used for cooling of electrical components of propulsion systems. The tests enabled the obtainment of the field of temperature, stresses and displacements during the process and residual stresses and displacements of welded elements after cooling. Knowledge of the thermal conditions of the process, the stress and strain fields were used while designing clamps and pads of a welding stand for the welding of the heat exchanger components.

T. Strite, A. Gusenko, M. Grupp, T. Hoult – Multiple Beam Fibre Lasers Used for Material Processing

DOI: *10.17729/ebis.2016.3/4*

Technological processes such as welding, braze welding or surface treatment utilising single-spot laser beams as welding power sources are well known and commonly applied. The improvement of technological processes and quality of treatment are subjects of research in terms of new laser welding technologies. The article presents attempted applications of several laser beams having various parameters in the braze welding of car body sheets, the welding of AlSi-coated high strength steels and in the making of polymer-metal joints.

G. Rogalski, D. Fydrych, K. Prokop-Strzelczyńska – Effect of the Magnetisation of Covered Electrodes on the Quality and Properties of Underwater Wet Welded Joints

DOI: *10.17729/ebis.2016.3/5*

The article analyses the effect of the magnetisation of covered electrodes on the geometry and properties of T-joints with fillet welds made of steel S235JR in watery environment. It was established that as regards the conditions and parameters used in the tests, the magnetisation of electrodes affected the stability of arc burning and the formation of shape-related welding imperfections but it did not influence the microstructure and hardness of the test joints.

R. Krawczyk, J. Kozłowski - Thick-Walled Materials Weldability Assessment Based on Test SEP 1390

DOI: *10.17729/ebis.2016.3/6*

The article presents issues related to weldability assessment concerning thick-walled materials used in the making of steel welded structures. The article describes weldability assessment tests in accordance with the guidelines of test SEP 1390, recommended for thick-walled structural materials exposed to dynamic loads. The objective of the tests involved the assessment of the usefulness of test SEP 1390 when evaluating the weldability of thick-walled structural materials used for welded structures.

O.W. Machnienko, I.W. Mirzov – Stresses and Strains of Equipment Inside a WWER-1000 Nuclear Reactor

DOI: *10.17729/ebis.2016.3/7*

The article concerns the modelling of stresses and strains of the enclosure of the active zone and chamber housing inside a WWER-1000 reactor, taking into consideration welding, heat treatment and the operation of the structure in the conditions of intense radiation. The work presents the input of welding internal stresses and contact stresses into the total stress of the chamber housing inside the reactor vessel. The article-related research involved testing the relaxation of welding internal stresses in the active zone enclosure caused by radiation creep.

Biuletyn Instytutu Spawalnictwa
ISSN 2300-1674

Publisher:
Instytut Spawalnictwa (The Institute of Welding)

Editor-in-chief: ***Prof. Jan Pilarczyk***

Managing editor: *Alojzy Kajzerek*
Language editor: *R. Scott Henderson*

Address:
ul. Bł. Czesława 16-18, 44-100 Gliwice, Poland
tel: +48 32 335 82 01(02); fax: +48 32 231 46 52
biuletyn@is.gliwice.pl;
Alojzy.Kajzerek@is.gliwice.pl;
Marek.Dragan@is.gliwice.pl
http://bulletin.is.gliwice.pl/