ISSN 2300-1674

BIULETYN
INSTYTUTU SPAWALNICTWA

70 YEARS OF INSTYTUT SPAWALNICTWA

No. 1/2015

INSTITUTE OF WELDING BULLETIN

BIULETYN INSTYTUTU SPAWALNICTWA

No. 1 BIMONTHLY Volume 59

CONTENTS

INSTITUTE OF WELDING

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

Summaries of the articles

J. Niagaj, A. Jędrusiak – The Effect of Shielding Gas Composition and Orbital TIG Welding Parameters on the Dimensions and Quality of Austenitic Stainless Steel Pipe Girth Welds

The article presents the results of orbital welding of AISI 304 (1.4301) austenitic stainless steel pipes using a closed welding head. The article-related tests revealed that an increase in a helium content in a shielding gas mixture increases a penetration depth with a little impact on a weld width. It was also found that an increase in welding current and a decrease in a welding rate can ensure full penetration, yet at the same time it can lead to the formation of imperfections in the form of an incompletely filled groove at 9h and 12h and/or an intermittent undercut at 3h. Welded joints of austenitic stainless steel pipes are characterised by the highest concentration of imperfections at 3h and 9h (incompletely filled grooves and intermittent undercuts) regardless of the type of a shielding gas used.

K. Krasnowski – Concrete-reinforcing Steel Bars - Applications and Fatigue Tests

The article describes the requirements set for concrete-reinforcing steel bars as to their fatigue strength and presents types of fatigue tests as well as examples of test results. The work also describes the effect of selected factors on the fatigue strength of concrete-reinforcing steel bars, demonstrates problems accompanying experimental fatigue tests involving reinforcing bars and presents a fatigue tests methodology enabling the obtainment of valid test results, developed by Instytut Spawalnictwa. The methodology was validated while testing B500SP grade reinforcing bars of diameters restricted within a 8-25 mm range.

J. Czuchryj, P. Irek –Dye-Penetrant Method Assessment of the Size of Pores in Welded Joints Made of High-Alloy Steel

The article describes the penetrant tests carried out on X5CrNi18-10 high-alloy steel provided with artificial discontinuities, i.e. pores (drilled openings). The tests involved the measurements of indication sizes depending on the time of development and various diameters and depths of openings. The correlations determined enable estimating the depth of pores in welded products made of high-alloy steels. The information obtained should enable decision-making concerning the acceptance of a product for operation or the necessity of repairing it. The tests also involved the determination of an optimum indication development time for high-alloy steels. The article is the continuation of the research works published in editions nos. 4/2012 and 4/2014 of this magazine.

M. Restecka – Robotisation - Global Trend

Higher quality, lower costs, shorter order processing times belong to requirements increasingly commonly set for manufacturers. Presently, progress mainly consists in the automation or robotisation of single processes or of complete production lines. The article presents statistical data and trends concerning the development of robotisation in Poland and worldwide as well as provides examples of robotisation and automation in industrial companies.

I. Jastrzębska, J. Szczerba, P. Stoch, R. Prorok, E. Śnieżek – Effect of Electrode Coating Type on the Physico-chemical Properties of Slag and Welding Technique

The article presents the results of the physico-chemical tests concerning the properties of

various slags formed after welding with low-hydrogen and rutile electrodes as well as flux-cored wires. The slags tested were analysed for their phase compositions using X-ray diffractometry (XRD) X-ray fluorescence (XRF). The behaviour of slags at temperatures elevated to 1400°C was examined using a high-temperature microscope. The analysis of the high-temperature tests enabled the determination of slag characteristic temperatures, i.e. softening and melting points. The results obtained demonstrated various properties of slags, with the lowest characteristic temperatures for low-hydrogen slags and the highest characteristic temperatures for flux-cored wire slags. In addition, on the basis of different characteristic temperatures slags were classified in relation to their solidification rates.

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
www.bis.is.gliwice.pl

EDUCATION AND GRADUATION

categories:

- **International Welding Engineer (IWE)**
- **International Welding Inspector (IWIP)**
- **International Welding Technologist (IWT)**
- **International Welding Specialist (IWS)**
- **International Welding Practicioner (IWP)**
- **International Welder (IW)**
- **European Plastic Welder (EPW)**

AC 054

CERTIFICATES OF COMPETENCE

categories:

- **International/European Welding Engineer**
- **International/European Welding Technologist**
- **International/European Welding Specialist**
- **International/European Welding Practicioner**
- **International Welder (IW)**

The offer for non-destructive testing personnel includes the following courses:

- **Visual inspection**
- **Penetrant inspection**
- **Magnetic particle inspection**
- **Radiographic inspection**
- **Ultrasonic testing**

Instytut Spawalnictwa (Institute of Welding)
ul. Bł. Czesława 16-18, 44-100 Gliwice POLAND
tel.: +48 32 231 00 11, fax: +48 32 231 46 52
is@is.gliwice.pl, www.is.gliwice.pl


70 LAT
INSTYTUTU
SPAWALNICTWA


I S
®