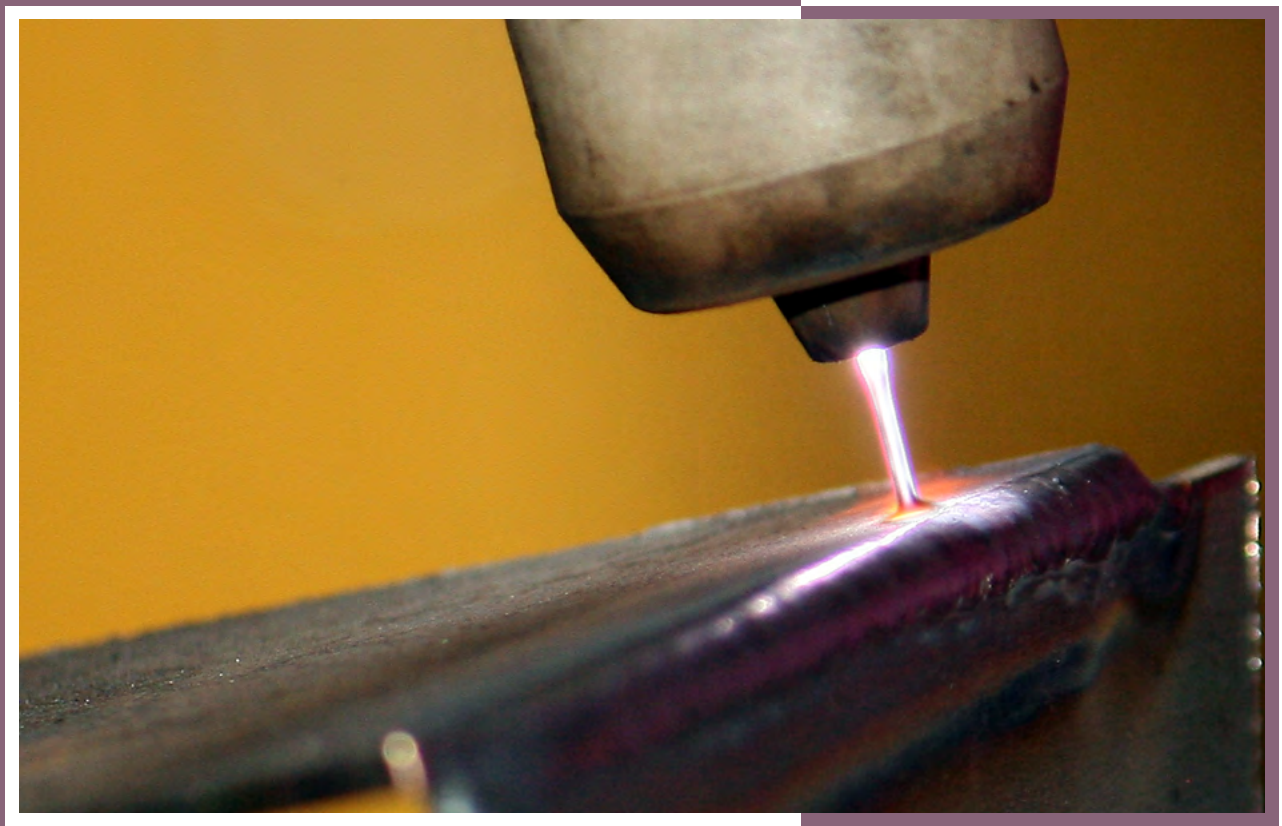
ISSN 2300-1674

BIULETYN
INSTYTUTU SPAWALNICTWA

Łukasiewicz
Instytut
Spawalnictwa



No. 3/2021

INSTITUTE OF WELDING BULLETIN

BIULETYN INSTYTUTU SPAWALNICTWA

No. 3 BIMONTHLY

CONTENTS

INSTITUTE OF WELDING

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

Marek St. Węglowski, Robert Jachym, Krzysztof Krasnowski, Krzysztof Kwieciński, Janusz Pikuła, Piotr Śliwiński – Electron Beam Melting of Thermally Sprayed Layers – Overview

DOI: *10.17729/ebis.2021.3/1*

Thermal spraying is one of the most common methods enabling the deposition of variously-purposed layers on surfaces of structural elements. However, in certain cases, the process of spraying itself is ineffective in terms of the stability and properties of protective layers. One of the possible solutions making it possible to reduce the porosity and improve the adhesion of surfaced layers involves their melting using the concentrated electron beam. The article contains an overview of reference publications concerning electron beam melting technologies.

Marcin Kempa – High-Performance Methods for Welding Steel P460NL2

DOI: *10.17729/ebis.2021.3/2*

The article discusses comparative test results concerning two welding methods, i.e. SAW and MAG. The tests involved the making of welded joints in steel P460NL2, the verification of the chemical composition of supplied steel, the comparison of the quality of joints (in accordance with PN-EN ISO 5817) as well as the performance of macroscopic tests and the comparison of mechanical properties and hardness.

Stanisław Klusek, Piotr Sędek, Kamil Kubik – New Weldable Steel for Rebars

DOI: *10.17729/ebis.2021.3/3*

A new steel grade, developed at the CELSA steelworks in Ostrowiec Świętokrzyski and used in the production of rebars, contributes greatly to the development of industrial and civil engineering. Steel B600B is characterised by yield point fyk = 600 MPa and immediate tensile strength ftk = 700 MPa. Tests revealed that the steel satisfies all requirements of related standards, both in terms of strength and processing properties. The mechanical properties of the new steel grade are higher by 20% than those of currently produced steels characterised by the highest mechanical properties (characteristic yield point Re= 500 MPa). As a result, the application of the new steel provides notable technical and economic advantages. The new steel grade meets requirements concerning technical class C in accordance with PN-EN 1992-1-1, which indicates that the steel has a significant yield point margin (being an important advantage in terms of limit state design). Plastic steels are easier to weld and less susceptible to welding crack formation. Technological (research-related) tests revealed the favourable welding properties of the new steel. Welding tests were performed using the manual metal arc welding method, i.e. the most common welding process used when making structural reinforcements. The welding tests involved the making of butt, overlap and cruciform joints. The strength and technological tests revealed that the steel satisfied the requirements specified in the PN-EN ISO 17660-1 standard.

Eugeniusz Turyk – Quality Criteria for G3Si1 and G4Si1 Electrode Wires

DOI: *10.17729/ebis.2021.3/4*

The article presents test results concerning the quality of ISO 14341-A-G3Si1 and G4Si1 electrode wires based on electrode wire-related quality criteria in accordance with the requirements specified in the PN-EN ISO 14341 and PN-EN ISO 544 standards. The article discusses the critical defects of the wires (non-compliances with standard requirements) as well as defects not covered by the requirements of the standards, yet decisive as regards the assessment of electrode wires by the user.

Antoni Sawicki – Selected Properties of High-Frequency Electric Arc Initiators and Stabilisation Oscillators. Part 2. Devices with Compressed Electric Arc

DOI: *10.17729/ebis.2021.3/5*

The second part of the overview article discusses general features of the design and operation of selected industrial arc plasma torches. Because of their structural and operating differences, plasma torch power supply systems with internal and partly external arc are discussed separately. Particular attention was paid to the design of electric systems used for the initiation of arc discharges. Because of the fact that the operation of plasma torches with partly external arc is often accompanied by the formation of double arc, the article also presents measures and methods enabling the prevention of the aforesaid unfavourable phenomenon. In addition, the article discusses selected technological properties of plasma torches and micro-plasma torches used for joining, cutting, surfacing and hardening.

Łukasz Rawicki – Unconventional Methods of Non-Destructive Tests. Part 3

DOI: *10.17729/ebis.2021.3/6*

The article presents some testing methods applicable in the aviation industry. In addition to popular non-destructive methods, NDT methods used in the aviation industry (and discussed in the article) include optical halography or shearography. Structural materials used in the aviation industry as well as the importance of analyses, both at the manufacturing stage and during operation, require the performance of regular tests as a negligent approach to such activities could end up in a catastrophe.

Biuletyn Instytutu Spawalnictwa
ISSN 2300-1674

Publisher:
Łukasiewicz - Instytut Spawalnictwa

Łukasiewicz
Instytut
Spawalnictwa