

Methodology of Increasing Safety of Welding Joints in Pressure Vessels X5CrNi18-10

Martina Vacková¹, Martin Val'ko², Slavko Pavlenko³, Jozef Hal'ko³

¹University of Security Management in Košice, Koščová 1, 040 01 Košice. Slovakia. E-mail: martina.vackova@vsm.sk

²Kaiser Eastern Europe s.r.o., Priemyselná 604/5, 922 02, Krakovany. Slovakia. E-mail: martin.valko@kaiser-ee.sk

³Faculty of Manufacturing Technologies of the Technical University in Košice with seat in Prešov, Bayerova 1, 080 01 Prešov. Slovakia. E-mail: slavko.pavlenko@tuke.sk jozef.halko@tuke.sk

The paper deals with welding joints and the methodology of increasing safety during austenitic chromium-nickel steels welding – type EN 10028-7 1.4301 (X5CrNi18-10). The technology of submerged arc steel welding 1.4301 using MAG enables a wider application of these steels in terms of the production of pressure vessels, but despite following all the safety regulations of heterogeneous welding stated in WHS, there might be an occurrence of melting defects of carbon parts through the welding of joints. The aim of this paper is to discuss the corrections of welding penetrations of the additional material during inhomogeneous welding, with the least possible destruction of the original material.

Keywords: welding, welding joints, austenitic chromium-nickel steels welding, safety during welding

References

- [1] BERNASOVSKÝ, P., MALÍK, K. (1988). *Odolnosť austenitických korózivzdorných ocelí proti likvidačnej praskavosti vo zváraní*. Zváračské správy (VÚZ). (Resistance of austenitic corrosion resisting steels against liquidating cracking in welding. Welding reports). 1988. (in Slovak)
- [2] Böhler welding. Filler Metals for joining Applications. Catalogue, 2014. [online] <https://www.google.sk/?gws_rd=ssl#q=B%C3%B6hler+welding.+Filler+Metals+for+joining+Applications.+>
- [3] ČÍHAL, V. (1999). *Korozivzdorné oceli a slitiny*. (Stainless steels and alloys). Praha, Academia AV, 1999. 437 p. ISBN 80-200-0671-0 (in Czech)
- [4] ČÍHAL, V. (1978). *Mezikrystalová koroze ocelí a slitin*. (Intergranular corrosion of steels and alloys). Praha. Nakladatelství technické literatury SNTL, 1978. 408 p. (in Czech)
- [5] HRIVŇÁK, I. (2013). *Zváranie a zvariteľnosť materiálov*. (Welding and weldability of materials) Citadella, 2013, 496 p. ISBN: 9788089628186 (in Slovak)
- [6] HRIVŇÁK, I. (2009). *Zváranie a zvariteľnosť materiálov*. (Welding and weldability of materials). Slovenská technická univerzita, 2009, p. 486. ISBN: 9788022731676 (in Slovak)
- [7] PATEK,M., KONAR,R., SLADEK,A., RADEK, N. (2014). Non-destructive testing of split sleeve welds by the ultrasonic TOFD method. In: *Manufacturing technology*, vol. 14, No.3, pp. 403-407. J.E.Purkyne University, Ústí nad Labem. ISSN 1213-2489.
- [8] KONAR,R., MICIAN,M. (2014). Non-destructive testing of welds in gas pipelines repairs with Phased Array ultrasonic technique. In: *Manufacturing technology*, vol. 14, No. 1, pp.42-47. J.E.Purkyne University, Ústí nad Labem. ISSN 1213-2489.
- [9] VRZGULA, P., FATURIK, M. MICIAN, M. (2014). New inspection technologies for identification of failure in the material and welded joints for area gas industry. In: *Manufacturing technology*, Vol. 14, No. 3, pp 487-492. J.E.purkyne University, Ústí nad Labem, ISSN 1213-2489.

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