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Estimates of weldability and selection of the optimal procedure
and technology for welding of high strength steelsV. Lazić^a, S. Aleksandrović^a, R. Nikolić^{a,c,*}, R. Prokić-Cvetković^b,
O. Popović^b, D. Milosavljević^a, R. Čukić^a^aFaculty of Engineering, University of Kragujevac, Sestre Janjic 6, 34000 Kragujevac, Serbia^bFaculty of Mechanical Engineering, University of Belgrade, Kraljice Marije 16, 11000 Belgrade, Serbia^cFaculty of Civil Engineering, University of Žilina, Univerzitná 8215/1 Žilina, Slovakia

Abstract

High strength steels belong into a group of high quality steels, with exceptional mechanical properties, especially in regards to tensile strength. At the same time, as their deficiency is emphasized the limited and difficult weldability. In other words, some of those steels are weldable only with application of special measures related to controlled heat input. In that way, the favorable mechanical properties can be kept within the heat affected zone, with condition that the optimal welding technology is selected. Existing, very scarce and often unclear and insufficient recommendations for selection of the optimal welding technology are one of the causes of large number of flaws in welded joints. Mentioned problems, as well as others, can be successfully solved by proper selection of the procedure, filler metal and technology of welding, verified by experiments conducted in laboratory or in real operating conditions. Those experiments can not be performed in arbitrary conditions. Thus, partially due to results reported in this paper, technologists will obtain the possibility to predict in advance, in a very short time period, the mechanical and metallurgical properties of joints of this class of high strength steels. This will be possible without conducting the large number of practical tests or relying on personal experience of a designer.

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1. Introduction

In this paper are considered problems of high strength steels welding, with special attention being devoted to special low-alloyed steels of the S690QL class (EN 10025-6). Their microstructure is interphase tempered

* Tel.: +421-948-64-2004; fax: +421-41-513-5690

E-mail address: ruzicarnikolic@yahoo.com

