Concatenated JPRS Reports, 1992

BRS Assigned Document Number: 000001316

AFS Number:	927D0037B	Entry Date:	
Classification:	UNCLASSIFIED	Status:	[STAT]
Language:	Russian	Country:	
Document Date:	01 Aug 91	Category:	[CAT]
Report Type:	JPRS report	Report Date:	25 Feb 92
Report Number:	JPRS-UMS-92-002	UDC Number:	
Report Series:	Science & Technology	Start Page:	51
Report Division:	WELDING, BRAZING, SOLDERING	End Page:	52

City/Source of Document: Kiev AVTOMATICHESKAYA SVARKA

Author(s): P. Seyffarth, doctor of technical sciences and H.G. Gross, candidate of technical sciences, Rostock University, Germany; V.A. Dovzheko and V.G. Vasilyev, candidates of technical sciences, Electric Welding Institute imeni Ye.O. Paton, UkSSR Academy of Sciences; and A.P. Ammosov, candidate of technical sciences, M.A. Fedotova, engineer, and V.P. Larionov, doctor of technical sciences, Institute of Physics Engineering Problems of the North, Yakutsk Scientific Center, Siberian Depa

Report Name: Central Eurasia: Materials Science

Headline: The Structural Transformations and Properties of Metal in the Heat-Affected Zone of Welded Joints of the Steel 10CrCNiCu

Source Line: 927D0037B Kiev AVTOMATICHESKAYA SVARKA in Russian No 8, Aug 91 (manuscript received 16 Feb 90; after revision 4 Mar 91) pp 12-16

Subslug: [Article by P. Seyffarth, doctor of technical sciences and H.G. Gross, candidate of technical sciences, Rostock University, Germany; V.A. Dovzheko and V.G. Vasilyev, candidates of technical sciences, Electric Welding Institute imeni Ye.O. Paton, UkSSR Academy of Sciences; and A.P. Ammosov, candidate of technical sciences, M.A. Fedotova, engineer, and V.P. Larionov, doctor of technical sciences, Institute of Physics Engineering Problems of the North, Yakutsk Scientific Center, Siberian Depa

FULL TEXT OF ARTICLE:

1. [Article by P. Seyffarth, doctor of technical sciences and H.G. Gross, candidate of technical sciences, Rostock University, Germany; V.A. Dovzheko and V.G. Vasilyev, candidates of technical sciences,

Concatenated JPRS Reports, 1992

Electric Welding Institute imeni Ye.O. Paton, UkSSR Academy of Sciences; and A.P. Ammosov, candidate of technical sciences, M.A. Fedotova, engineer, and V.P. Larionov, doctor of technical sciences, Institute of Physics Engineering Problems of the North, Yakutsk Scientific Center, Siberian Depa

2. UDC [621.791.75.052:669.15-194.2]:620.18

3. [Abstract] The authors of the study reported herein compared data obtained in simulations of welding heating cycles. They also studied the quantitative relationships existing among the structural components and mechanical properties of different variations of type 10CrCNiCu steel (which is a low-ally steel that is widely used in machine building and shipbuilding). The dilatometric studies and quantitative phase analyses reported and analyzed were performed at **Rostock University**, the Ye.O. Paton Electric Welding Institute, and the Institute of Physics Engineering Problems of the North. The thermokinetic diagrams of the austenite transformation in type 10CrCNiCu steel at each of these institutions were in very good agreement with one another: the temperatures of the beginning and end of the phase transformations and the cooling cycles on the individual diagrams virtually coincide with those on the others. Analysis of the dilatometric studies and the analysis of the set of mechanical properties of the heat-affected zone of welded joints of 10CrCNiCu steel conducted at the three institutions revealed that the difference in the content of the alloy-forming elements within the confines of the composition stipulated in its type specification does affect the formation of the end structure obtained when the steel is welded. The best joints of 10CrCNiCu steel produced by mechanized CO<inf>2<reset>-shielded arc welding and submerged-arc are achieved when cooling rates of 3.5 to 55°C/s are used. The following conditions were found to result in welded joints of 10CrCNiCu steel with the best cold resistance: steel thickness, up to 30 mm; shielding medium, CO<inf>2<reset>; welding wire, Sv-08Mn2C; welding wire diameter, 1.6 and 2.0 mm; and per-unit-length energy, 10.0 to 21.0 kJ/cm (which corresponds to a cooling rate of 40 to 10°C/s). Figures 3, tables 2; references 7: Russian, Western.

4.