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ONLINE ISSN : 1881-1760

PRINT ISSN : 1880-3717

Journal of the Japan Society of Naval Architects and Ocean Engineers

Vol. 4 (2006) pp.63-69

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Study of Transverse Shrinkage Generated in Steel with Phase Transformation by Welding

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(Received July 5, 2006)

Summary: This paper deals with the effect of phase transformation on the transverse shrinkage by comparing experimental data and numerical results of transverse shrinkage generated by welding. Both mild steel with non-transformation effect and 3.5Ni-steel with transformation effect were welded by laser welding. The transverse shrinkage of 3.5 Ni steel was almost equal to that of mild steel. This reason is the following two causes:(1) the transformation expansion on cooling process makes the transverse shrinkage small and (2) thermal shrinkage of austenite phase before martensite transformation on cooling process makes the transverse shrinkage large. The total shrinkage obtained from above two reciprocal causes on cooling process is not affected very much by phase transformation.

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Toshio Terasaki, Hiroki Kawakami, Michiaki Fukuya and Takanori Kitamura: Study of Transverse Shrinkage Generated in Steel with Phase Transformation by Welding , Journal of the Japan Society of Naval Architects and Ocean Engineers, (2006), Vol. 4, pp.63-69 .



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