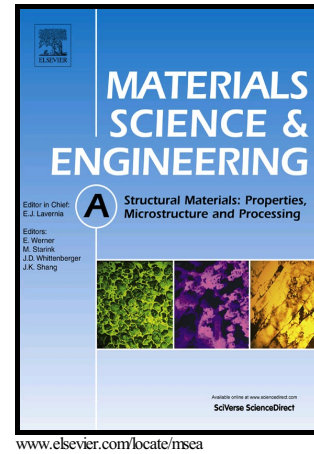


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Weld residual stresses in a thick plate considering back chipping: neutron diffraction, contour method and finite element simulation study

Yu Wan^a, Wenchun Jiang^{a*}, Jian Li^b, Guangai Sun^b, Dong-Kyu Kim^c,

Wanchuck Woo^c, Shan-Tung Tu^d

^aState Key Laboratory of Heavy Oil Processing, China University of Petroleum (East China), Qingdao, 266580, PR China

^bKey Laboratory of Neutron Physics and Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang 621999, PR China

^cNeutron Science Center, Korea Atomic Energy Research Institute, 1045 Daedeok-daero, Yuseong-gu, Daejeon, 305-353, South Korea

^dKey Laboratory of Pressure System and Safety (MOE), School of Mechanical and Power Engineering, East China University of Science and Technology, Shanghai 200237, PR China

Abstract

Neutron diffraction measurement, contour method and finite element method have been combined together to study the distribution of weld residual stresses in a thick plate considering the effect of back chipping. The comparison among the three methods, the effect of back chipping and the formation mechanism of the residual stresses in the thick plate were analyzed. The results show that the residual stress distribution exhibits an “M” shape across the specimen width. Large tensile residual stresses slightly exceeding the yield strength were generated in the back weld and top weld layer. Back chipping has a great influence on the residual stress profile. It can change not only the distribution shape of residual stress but also the position of the

* Corresponding author. Tel.: +86 532 86980609, fax: +86 532 86980609.
E-mail address: jiangwenchun@126.com

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