Investigation of the thickness effect on fatigue life calculation in a single bevel butt weld in A36 steel using experiment and its comparison with simulation results.

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(Received 24 October 2016 ; Accepted 31 December 2016)

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Abstract
Nowdays, the prediction and prevention of fatigue failures is converted to one of the most concerns for industry owners. Since the processes of fatigue suddenly occur, it is most important and necessary to recognize the effective factors of fatigue life of structures. Mechanical and thermal multiple loading are the important factors of the fatigue failure. In order to appropriate fatigue design, analysis should be validated with experimental results. In present research, fatigue life of A36 welded steel samples obtained from test is compared by finite element results obtained from commercial ansys pakage. In this research, the effects of residual stress, reinforcement, notch and thickness of sampels on fatigue life are studied. Results of analytical simulation and experimental show good agreement. Results also shows the dominant effect of reinforcement on the fatigue life.

Keywords: Fatigue, Multi-pass welding, Residual stress, Butt joint, Strain-life method, Thickness, Notch, Reinforcement.