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Guotao Yin, Yueyue Wang, Haichao Cui, Fenggui Lu, Peiquan Xu

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Guotao Yin[a], Yueyue Wang[a], Haichao Cui[b, c], Fenggui Lu[b, c], Peiquan Xu[a, c, *]

[a] College of Materials Engineering, Shanghai University of Engineering Science, Shanghai 201620, China.

[b] School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai 200240, China.

[c] Shanghai Key Laboratory of Materials Laser Processing and Modification, Shanghai Jiao Tong University, Shanghai, 200240, People's Republic of China.

*Corresponding author: Peiquan Xu (P. Xu) Email: pqxu@sues.edu.cn.

Abstract: Post welding heat treatment was performed on dissimilar weldments composed of WC-Co to 316L stainless steel with 1-mm-, 1.5-mm-, and 2-mm-thick Invar interlayers by heating the samples to 1250°C for 2 hours, 8 hours, and 16 hours respectively. Cracks initiation and propagation were observed in all samples because of the stress relieving after heat treatment. The increase of the interlayer's thickness tends to partially inhibit the initiation and propagation of cracks. When the holding time is 2 hours, the sample fractured in the heat affected zone (HAZ). With the increase of holding time (8 hours, 16 hours), the samples tended to fracture in the