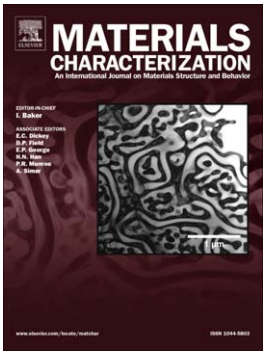

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Abstract

In the present paper, microstructural characterization across an as-welded dissimilar austenitic / duplex stainless steel couple welded by a super duplex stainless steel filler metal using optical microscopy and electron back-scattered diffraction techniques is discussed. Accordingly, variations of microstructure, texture, and grain boundary character distribution of base metals, heat affected zones, and weld metal were investigated. The results showed that the weld metal, which was comprised of Widmanstätten austenite side-plates and allotriomorphic grain boundary austenite morphologies, had the weakest texture and was dominated by low angle boundaries. The welding process increased the ferrite content but decreased the texture intensity at the heat affected zone of super duplex stainless steel base metal. In addition, it changed the morphology of elongated grains of the rolled microstructure to twinned partially transformed austenite plateaus scattered between ferrite textured colonies through partial ferritization. However, the texture of the austenitic stainless steel heat affected zone strengthened through encouraging recrystallization by formation of annealing twins. At both interfaces, an increase in the special character coincident site

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