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标题: Evolution of microstructure and corrosion behavior in 2205 duplex stainless steel GTA-welding joint

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摘要: The microstructure, microhardness and corrosion behavior in five zones from the weld metal to base metal of a 2205 duplex stainless steel joint, which was welded by double-pass tungsten inert gas arc welding with filler wire, were investigated systematically. Results indicated that a great deal of secondary austenite appeared in weld metal due to the reheat of second pass welding and coarse ferrite grains were formed near the fusion line, while other zones had the similar microstructures with a different austenite content. It also revealed the microhardness was determined by the partitioning of alloying elements (Cr, Mo, Ni and N) and precipitates such as chromium nitride. Austenite was harder than ferrite from weld metal to fusion line, while it reversed from fusion line to base metal. Electrochemical measurement indicated the zone containing fusion line was the easiest to suffer pitting attack, followed by weld metal zone. Moreover, the surface morphologies were in good agreement with the electrochemical measurements. (C) 2015 The Society of Manufacturing Engineers. Published by Elsevier Ltd. All rights reserved.

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