عنوان مقاله:

Gas Tungsten Arc Welding of HP Heat Resistant Steel with ۲۵Cr-۳۵Ni and ۳۵Cr-۴۵Ni Filler Metals

محل انتشار:

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خلاصه مقاله:

This paper investigates the effects of ۲۵Cr-۳۵Ni and ۳۵Cr-۴۵Ni filler metals on the weldability, microstructure, and mechanical properties of ۲۵Cr-۳۵Ni heat-resistant steel. Alloy ۲۵Cr-۳۵Ni is known to have excellent high temperature properties, such as creep resistance and high temperature corrosion/oxidation resistance, making this grade an ideal option for demanding high temperature applications in oil, gas, and petrochemical industries. Gas tungsten arc welding is a routine welding practice for the repair and joining of components, made of heat resistant steels. Microstructure and mechanical properties of welded samples with ۲۵Cr-۳۵Ni and ۳۵Cr-۴۵Ni filler metals were studied using optical microscopy, electron microscopy, and tensile and hardness tests. Fractography of fracture surfaces was also conducted, using electron microscope. Results show that the microstructure in the heat affected zone area in both cases are largely affected by the heat input during melting. A noticeable carbide dissolution was observed in both cases. In neither of filler metals was there any indication of sigma phase formation in the weld, which is related to the high nickel content of filler metals. Results also showed that mechanical properties in both cases are controlled by heat affected zone.

کلمات کلیدی:

۲۵Cr-۳۵Ni heat resistant steel, Welding, Mechanical properties