عنوان مقاله:

Effect of Shielding Gas Composition on Structural and Mechanical Properties of Al5083H321Gas Metal Arc Welding

محل انتشار:

دومین کنفرانس بین المللی آلومینیوم (سال: 1391)

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خلاصه مقاله:

The unique properties of aluminum have turned this metal to one of the most commonly used industrial metals in the world. Unlike steel welding, aluminum welding is much more complicated due to some thermo-physical properties of aluminum. Shielding gas is one of the most important parameters of GMA-welding that affects the melting rate, arc stability, the shape and depth of penetration. Experiments were carried out using different amounts of N2, and O2 added to Argon as the shield gas and then investigating the physical and mechanical properties of weld zone. It was concluded that adding minor amounts of oxygen and nitrogen (up to %0.5) to Argon was resulting to increase the arc stability, increase the depth of penetration and its mechanical properties. However, adding higher amounts of nitrogen and oxygen (more than 0.5%) to Argon, beside the formation of excessive brown and black oxide film on bead surface, bigger holes and inter-metal compounds observed. The results of tensile test of these samples showed that small amounts of N2 and O2 (up to % 0.1) increases the tensile strength of the penetration by 5.5 times more in compare with pure Argon. On the other hand, increasing much bigger amounts of N2 and O2 not only is not improving .the quality of penetration, but also lead to decreasing the outfit quality

کلمات کلیدی:

Double pulsed gas metal arc welding; 5083H321 Aluminum Alloy; shielding gas mixture; micro structural and mechanical properties