عنوان مقاله:

تاثیر عملیات حرارتی پس از جوشکاری بر ساختار و خواص مکانیکی اتصال انفجاری فولاد آستنیتی ۳۲۱ - آلومینیوم ۱۰۵۰ - آلومینیم ۵۰۸۳

محل انتشار:

دوفصلنامه علوم و فناوری جوشکاری ایران, دوره 9, شماره 1 (سال: 1402)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

In this research, the effect of post weld heat treatment on the microstructure and mechanical properties of the three-layer explosion welding joint of austenitic steel ۳۲۱-aluminum ۱۰۵۰-aluminum ۵۰۸۳ was investigated. The welded samples were heat treated at ۲۵۰ and ۳۵۰°C for ۱۰۰۰۰ seconds. The structure and properties were investigated using optical microscope, scanning electron microscope, microhardness measurement and shear-compressive strength. The results showed that in all conditions, the interface of aluminum ۵۰۸۳-aluminum ۱۰۵۰ was smooth and with complete continuity; However, the interface between stainless steel ۳۲۱ and aluminum ۱۰۵۰ had a reaction layer with variable and discontinuous thickness. During the heat treatment, the thickness of the interface layer increases according to the diffusion kinetics and reaches ۱۸.۶ microns in the maximum value. With the increase of heat treatment temperature, the average concentration of aluminum in the reaction layer of the interface increased from ۸۵% to more than ۹۰%, but the concentration of iron decreased from ۱۰% to less than ۵%. Also, shear-compressive strength decreases from ۹۴.۶ to ۵۶.۷ MPa.

کلمات کلیدی:

explosive welding, heat treatment, interface, interaction layer, shear-compressive strength,.
جوشکاری انفجاری, عملیات حرارتی, فصل مشترک, لایه واکنشی, استحکام برشی- فشاری