

## عنوان مقاله:

Effect of Heat Treatment on the Intermetallic Compounds and Mechanical Properties of Explosive Weld Interface of three Al ۵۰۸۳, Al ۱۰۵۰ and St ۱۵۱۵ Layers

## محل انتشار:

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## خلاصه مقاله:

In this research, the effect of heat treatment on the microstructure and mechanical properties of intermetallic compounds of welding joint interface of three explosive layers of ۵۰۸۳ and ۱۰۵۰ aluminum as flying and intermediary plates and AISI steel sheet as the base plate has been discussed and investigated. To show the effect of temperature and time, the welded samples with stand-off distance of ۶, ۸, and ۱۰ mm and the explosive load of ۲.۴۱ were placed on heat treatment in the constant temperature of ۳۱۵°C and ۴۵۰°C within a furnace protected by Argon gas for six hours. Laboratory investigations have been conducted by the use of photomicroscope, scanning electronic microscopy, and microhardness assessing tests. Metal compounds of the interface were specified by the use of EDS analysis. In the considered samples before heat treatments, the interface of the joint has been converted from the short wavy state into the vertical wavy state by the increase of stand-off distance from ۶ mm to ۱۰ mm, and the average diameter of intermetallic layers has been increased in a range from  $0.1 \pm 1.89$  micrometer to  $0.7 \pm 3.13$  micrometer as well. Also, microhardness has been decreased by the increase of intermetallic compounds from ۲۶۶ Vickers in the sample with a stand-off distance of ۱۰ mm to ۲۰۵ Vickers in the sample with a stand-off distance of ۱۰ mm in the steel section. The performance of treatment in temperatures of ۳۱۵°C and ۴۵۰°C for six hours has been led to increasing the diameter of the intermetallic compounds layer.

## کلمات کلیدی:

Heat treatment, Explosive Welding, intermetallic compounds, Stand-off Distance, Microhardness

## لینک ثابت مقاله در پایگاه سیویلیکا:

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