

Experimental Study on Ultrasonic Shot Peening Forming and Surface Properties of AALY12

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Abstract : Ultrasonic shot peening (USP) on AALY12 sheet was studied. Several parameters (arc heights, surface roughness, surface topography and microhardness) with different USP process parameters were measured. The research proposes that the radius of curvature of shot peened sheet increases with time and electric current decreasing, while it increases with pin diameter increasing, and radius of curvature reaches a saturation level after a specific processing time and electric current. An empirical model of the relationship between radius of curvature and pin diameter, electric current, time was also obtained. The research shows that the increment of surface and vertical microhardness of material is more obvious with longer time and higher value of electric current, which can be up to 20% and 28% respectively.

Keywords : USP forming, surface properties, radius of curvature, residual stress

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