Short Communication

Enhanced Diffusion Bonding Between High Purity Aluminum and 6061 Aluminum by Electrolytic Polishing Assistance

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The rolling trace on aluminum alloys usually affects the post surface treatments of high quality aluminum alloy products, such as medical supplies, 3C products, sport equipment, automobile parts, and aircraft parts. In order for aluminum alloys to have good mechanical properties and a high quality of surface smoothing and brightness, an aluminum alloy (6061 Al) substrate surface is bonded with high purity aluminum (5N Al). This work reports the development of a cost-effective way to join the interface between 5N Al and 6061 Al by electrolytic polishing and thermal pressure diffusion methods. Electrolytic polishing can smooth the surfaces of both 5N Al and 6061 Al, dissolve partial precipitates, form small pits, and generate an Al-rich zone on the 6061 Al surface. The small pits, smooth surfaces, and Al-rich zone enhance surface bonding in the thermal pressure diffusion process.

Keywords: Aluminum alloy, Pure aluminum, Joining , Diffusion, Interface

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