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Fabrication of Superhydrophobic Surface on the FSW Zone in Friction Stir Welding of Similar Aluminium Alloys

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Abstract: In this research, a simple and low-cost method has been used for the creation of a micro-nano structure superhydrophobic on FSW zone in friction stir welding of similar aluminium alloys 6000. The metallographic study was performed on FSW zone after the welding process. The water contact angles were measured for different areas of the welded zone, and it was found that in all regions, the water contact angle was at least 160°. It was concluded that, according to the Cassie-Baxter theory, more than 90% of the superhydrophobic surface of FSW zone that is in contact with water droplets, is formed from the air. Self- cleaning property of the superhydrophobic FSW sample was compared with typical FSW one. It was also observed that the superhydrophobic FSW zone is able to remove most liquids.

Keywords: Superhydrophobic; Nanostructured; Friction Stir Welding; Similar Aluminium Alloys; Self-Cleaning.