

عنوان مقاله:

Investigating the Effect of Considering Different Cross Section Design in Friction Stir Welded Joint Line of Dissimilar Aluminum Alloys

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خلاصه مقاله:

Using friction heat, welded joints of the Friction stir welding (FSW) process are made that are utilized to forge metal components together. Since there is no parent metal melting, several advantages are obtained by the FSW process over fusion welding. The alloys AA6XXX and AA7XXX Al are two sets of the most extensively utilized structural materials in rail transportation, automotive, and aerospace industries. The objective of present study was to investigate the effects of novel cross-sections in joint lines and further analyze the improvement in mechanical features. Due to the importance of the weld zone properties, many researchers seek to improve the mechanical behavior of the weld zone. For this, friction stir welded joint under four different new design in cross section named E_1 , E_2 , E_3 , E_4 and one conventional cross section, E_5 were conducted. Better outcomes are obtained by joints made utilizing this method based on joint quality and strength. The very good tensile features are displayed by the fabricated joints with Ultimate Tensile Strength (UTS) > 254 MPa and elongation > 7%. The highest UTS value which is occurred in E_3 condition (Downward step) is 24.7% higher than required for FSW of AA6061 alloy at T_6 condition in the American Welding Society (AWS) standard (186 MPa).

کلمات کلیدی:

Friction Stir Processing, Cross Section in Joint line, tensile properties

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