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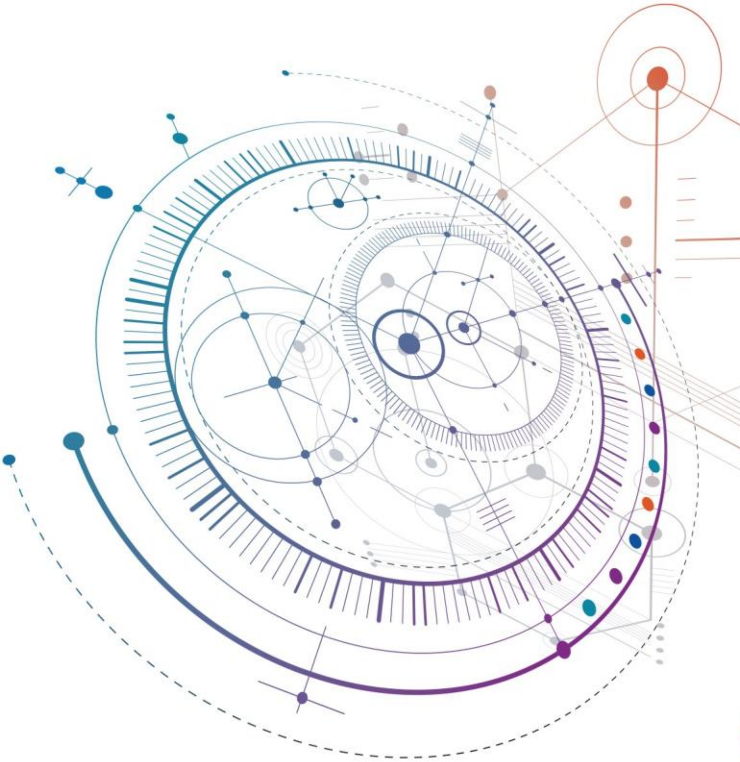

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Chapter 5

Friction Stir Spot Welding (FSSW) Scope and Challenges

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Abstract

At the end of the last century, Friction stir welding (FSW) technology was invented as a distinct solid-state welding technology. The rapid development in the research aspect has led to a steady increase in its industrial applications. Friction stir spot welding (FSSW) is a particular case of FSW with no transverse speed during welding. The success of the FSSW technique is determined by the welding parameters such as axial load, dwell time, rotational speed, and plunge depth, besides the tool's material and geometry. Recently, several studies tried to modify the conventional FSSW, such as refill, swing and swept, besides the pin-less techniques. Expanding the applications of FSSW depends mainly on finding a clear understanding of this technique, such as finding the optimal values for the tool design and the welding parameters in addition to the heat generated and the behavior of the metal flow affected by the resulting microstructure and mechanical properties. The joint welding efficiency and performance discreteness are the major challenges for the FSSW application.

This chapter describes the FSSW fundamentals, advantages, and classification. It discusses the effects of input welding parameters on the quality of the resulting weld joint, whether in similar or dissimilar metals.

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