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Friction-Stir Welding/Processing of Aluminum Alloys

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Message from the Guest Editor

Friction stir welding is a relatively novel solid-state joining technology. FSW avoids undesirable solidification phenomena and thus routinely produces sound welds with excellent mechanical properties even in aluminum alloys which are conventionally considered to be “unweldable”. The numerous advantages of this technique include low energy consumption, high productivity, and flexibility. It is also important to emphasize that FSW is a “green” technology, which requires no shielding gases and filler materials. As a result, FSW is widely used in industry. Moreover, FSW typically results in the formation of fine-grained microstructures. The fine-grained characteristics of this process have enabled its application in material processing. This derivation of FSW technology is known to as friction stir processing (FSP).

The aim of this Special Issue is to present new achievements in the friction stir welding/processing of aluminum alloys, new tendencies in technique developments, theoretical and experimental studies of FSW/FSP, microstructure evolution and influence on mechanical properties, and processes of recrystallization and precipitation.

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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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