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## Aluminium based In-Situ Composite Fabrication through Friction Stir Processing: a Review

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**Abstract:** Aluminium metal matrix composites (AMMCs) are the fastest developing materials for structural applications due to their high specific weight, modulus, resistance to corrosion and wear, and high temperature strength. In-situ processing is preferred over ex-situ processing approach for producing fine and thermodynamically more stable reinforcements, but issues related to defects such as porosity, particle clustering etc. are always there in fabrication of AMMCs through conventional methods. Friction Stir Processing (FSP) has evolved as a promising surface composite fabrication technique mainly because it is an eco-friendly and solid-state process. Synthesizing reinforcing particles in aluminium matrix through FSP is more attractive than conventional AMMCs fabrication because intense plastic deformation during FSP not only synthesises the reinforcement phase in the matrix in-situ it also shears and diffuses the particles and progress the reaction between aluminium and added particles rapidly. This article addresses the current status of in-situ AMMCs fabrication through FSP technique. The objective of this article is to review and summarize various systems of in-situ AMMCs fabrication such as Al- Transition metals (TM), Al- Metal oxides (MO), and Al-Salt reaction systems, at various operating conditions and FSP parameters and their effects on resultant microstructure and final properties. This review article will be useful to academicians, researchers and practitioners as it comprises significant knowledge pertaining to AMMCs using FSP.

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