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The Effect of Elevated Temperature Homogenization and Extrusion on the Microstructure and Mechanical Properties of Al-Mg₂Si in-situ composite

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Abstract: An in-situ Al-based composite with Mg₂Si secondary phase was subjected to heat treatment and hot extrusion processes. It was found that the homogenization treatment tremendously influences the eutectic Mg₂Si phase and sharp edges of the primary particles toward slight enhancement of tensile properties. A magnificent improvement in mechanical properties was achieved after hot extrusion, which was ascribed to the changing the morphology of the primary Mg₂Si particles to more round or spherical shapes, the break-up of the eutectic network, and closure of the casting defects. This signifies the industrial application of these composites in the wrought form.

Keywords: In-situ composite; Homogenization; Extrusion; Tensile properties