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# Enhanced Coarsening Resistance of *Q*-phase in Aluminum alloys by the addition of Slow Diffusing Solutes

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## Abstract

Here, we design thermally stable microstructures of  $\text{Al}_3\text{Cu}_2\text{Mg}_9\text{Si}_7$  (*Q*) precipitates based on commercial aluminum alloy (AS7GU) for automotive applications utilizing low-diffusivity solutes in aluminum. We find that the newly developed alloys show a ~20 % enhancement in mechanical properties at 300°C compared to the baseline AS7GU alloy.

**Keywords:** Aluminum alloys; *Q*-phase precipitates; Coarsening; Mechanical strength; Transmission-electron microscopy (TEM); Atom-probe tomography (APT);

## 1. Introduction

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