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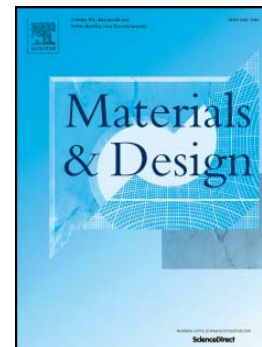
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## Effect of crystallographic texture on precipitation induced anisotropy in an aluminium magnesium silicon alloy

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### Abstract

The effect of crystallographic texture on precipitation induced anisotropy in yield strength of an aluminium magnesium silicon alloy was investigated. Solutionized samples were subjected to unidirectional and multi-step cross rolling to yield distinct crystallographic textures in the Al-Mg-Si alloy. The rolled sheets were then subjected to annealing followed by second solutionizing treatment to provide sheets with similar grain size and dislocation content but distinct texture. Ageing experiments were carried out on these sheets at 443K for different time intervals. It was observed that the evolution of anisotropy in yield strength of the age hardened alloy depends on texture. The difference in age hardening response brought about by varying initial texture controls the evolution of anisotropy in mechanical properties of the alloy. This was manifested in terms of transition from anisotropic to isotropic mechanical properties in the unidirectionally rolled samples after peak ageing. On the contrary, a transition from isotropic to anisotropic yield behaviour was observed for multi-step cross rolled samples. This is attributed to enhanced precipitation hardening in crystallographically softer orientations compared to crystallographically harder orientations.

**Keywords:** Rolling, Texture, Precipitation hardening, Anisotropy, Yield Strength

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