

Precipitation role in strengthening and improved conductivity of HPTE-processed Al-Mg-Si alloy

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Aluminum alloys are attracting noticeable attention in electrical application due to their high conductivity, corrosion resistance and low price. However, low strength decreases their lifetime and subsequently results in significant expenses. Combination of SPD and post ageing is proposed as a potential approach to optimize electrical and mechanical properties [1]. High pressure torsion extrusion (HPTE) [2] is a relatively novel SPD method which can open up new possibilities for further scale-up the products size, as shown in this study. Samples processed via this method followed by post aging revealed high strength with markedly improved conductivity. Size, shape and density of precipitates are analyzed by means of HRTEM, STEM and APT..

Keywords: precipitation, HPTE, electrical conductivity, mechanical strength

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