

## Documents

Dashti, A., Shaeri, M.H., Taghiabadi, R., Djavanroodi, F., Ghazvini, F.V., Javadi, H.

**Microstructure, texture, electrical and mechanical properties of AA-6063 processed by multi directional forging**  
(2018) *Materials*, 11 (12), art. no. 2419, . Cited 8 times.

### Abstract

In current research, the effect of the multi-directional forging (MDF) process on the microstructure, texture, mechanical and electrical properties of AA-6063 under different heat treatment conditions at various MDF temperatures was studied. The annealed AA-6063 alloy was processed up to three passes of MDF at ambient temperature. Three passes of this process were also applied to the solution-treated AA-6063 at ambient temperature and 177 °C. Microstructural investigations demonstrated that the MDF process led to a significant reduction in the average grain size as well as a considerable increase in the fraction of low angle grain boundaries. Texture analysis revealed that copper and Goss textures were mainly developed within the annealed and solution-treated samples of AA-6063, respectively. The hardness and shear strength values of all processed samples also showed a sizeable improvement compared to the initial heat-treated samples. For example, the hardness and shear yield strength value of the solution-treated sample MDFed for three passes showed more than 100 and 70% increase, respectively. The effect of the MDF process on the electrical conductivity of AA-6063 under different heat treatment conditions at various temperatures was negligible. So, it can be concluded that the MDF process increased the mechanical properties without an appreciable decrease in electrical conductivity. © 2017 by the authors.

2-s2.0-85057568493

**Document Type:** Article

**Publication Stage:** Final

**Source:** Scopus

**Access Type:** Open Access