

Mechanical Properties of Die-Cast Nonflammable Mg Alloy

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Abstract : Tensile specimens of nonflammable AZ91D Mg alloy were fabricated in this study via cold chamber die-casting process. Dimensions of tensile specimens were 25mm in length, 4mm in width, and 0.8 or 3.0mm in thickness. Microstructure observation was conducted before and after tensile tests at room temperature. In the die casting process, various injection distances from 150 to 260mm were employed to obtain optimum process conditions. Distribution of Al₁₂Mg₁₇ phase was the key factor to determine the mechanical properties of die-cast Mg alloy. Specimens with 3mm of thickness showed superior mechanical properties to those with 0.8mm of thickness. Closed networking of Al₁₂Mg₁₇ phase along grain boundary was found to be detrimental to mechanical properties of die-cast Mg alloy.

Keywords : non-flammable magnesium alloy, AZ91D, die-casting, microstructure, mechanical properties

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