Improvement of bending formability of AZX612 magnesium alloy by local texture control

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Abstract

The poor formability of magnesium alloys is the one of the major obstacles preventing the widespread application. The basal texture of the rolled sheet is obviously the reason for this but no efficient solution has not yet been found. On the other hand, in case of bending, a large tensile strain is only required on the outer surface. The basal texture can somewhat accommodate compression strain along the rolling direction by twinning. Therefore, the authors attempted to modify the surface texture by shot peening and heat treatment. The treated surface is covered with recrystallized grains having random orientation distribution. The processed sample showed better bending formability than as-received sheet. The thickness of the volume having randomized orientation distribution increases with increasing the size of shot particle. However, the increase of the surface roughness due to the use of coarse shot diminishes the bending formability.

Keywords: magnesium alloy, bending formability

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