

**TENSILE PROPERTIES OF AS-ROLLED Al-7.5Mg ALLOYS FABRICATED BY COMBINED
PROCESS OF EXTRUSION AND COLD-ROLLING**

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Abstract

Commercial grade Al-Mg alloys are increasingly being introduced in structural and closure applications to light-weight solutions to improve their fuel economy and reduce gas emissions. The Al-Mg alloys combine a wide range of strength, good forming and welding characteristics, and high resistance to general corrosion. The strength of Al-Mg alloys is mainly controlled by solute strengthening and it increases magnesium content up to about 5.5wt.% without reducing ductility.

The solubility of Mg in Al is 14.9wt.% at eutectic temperature. So, the Al-Mg alloys with higher magnesium content over 5.5wt.% up to the maximum can theoretically show higher mechanical properties. The strong tendency of Mg solute in Al melt to oxidize prohibits from widening the application. Industrially, the oxidation of Mg solute can be suppressed by adding trace amount of Beryllium, even though it is extremely harmful to human body. And recently, a specially fabricated Mg alloy containing Al₂Ca phase has been patented to inhibiting Mg oxidation.

The purpose of this study is to investigate tensile properties and microstructure of Al-7.5Mg alloy in a variety of as-rolled tempers. The Mg content over commercial range was selected to improve the mechanical properties. the alloy was continuously cast into a billet with 7inch of diameter. The billet was extruded into a sheet form followed by a cold-rolling. The tensile properties and microstructure of the alloy in a variety of temper were investigated and discussed.

Keywords: Aluminum, Al-Mg alloy, 5000 series, rolling, mechanical properties

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