

ACEX2019

*13th International Conference on Advanced Computational Engineering and Experimenting
ATHENS (Greece) from 1-5 July, 2019*

Development of Corrosion Resistant Magnesium Alloys

Bong Sun You, Jong Il Kim, Su Mi Jo, Young Min Kim

Korea Institute of Materials Science, Changwon, Gyeongnam, 51508, Korea.

The big issues in magnesium industry for the wider application of magnesium alloys in the automobile and aircraft parts have been the high flammability during melt handling and poor corrosion resistance since 1940s. New corrosion resistant magnesium alloys containing small amount of Ca and Y in AZ series alloy, initially designed for non-flammable alloy, have been introduced. The corrosion behavior, pitting corrosion and galvanic corrosion, improve significantly in as cast state and post treatment, although the other properties such as mechanical properties are unchanged. The excellent corrosion resistance is obtained not only in low-Al alloys such as AZ31 alloy but high-Al alloys, AZ91 alloy.

Previous results show that ignition temperature increased rapidly by Ca and Y addition in Mg-Al alloys regardless of aluminum contents. However, there is optimum balance in Ca and Y contents depending on Al content in Mg-Al alloys for corrosion resistance and non-flammability.

In addition, this paper summarizes field test results. Some activities for the application in electronic, railway, automotive and aerospace industries are introduced. Depending on the application field, the alloy composition is optimized to focus on corrosion resistance, non-flammability, strength, castability and extrudability separately in cast and wrought alloys.

1. Bong Sun You, Young Min Kim, Chang Dong Yim, Ha Sik Kim, *Magnesium Technology*, TMS, 2014(325~329)