

## **Magnesium Alloys for Biomedical Applications Processed by Severe Plastic Deformation**

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**Abstract :** The effect of high pressure torsion processing on mechanical properties and corrosion behavior of pure magnesium and Mg-Zn, Mg-Zn-Ca, Mg-Li-Y, and Mg-Y-RE alloys is investigated. Micro-tomography and SEM characterization are used to estimate corrosion rate and evaluate non-uniform corrosion features. The results show the severe plastic deformation processing improves the strength of all magnesium alloys, but deformation localization can take place in the Mg-Zn-Ca and Mg-Y-RE alloys. The occurrence of deformation localization is associated with low strain rate sensitivity in these alloys and with severe corrosion localization. Pure magnesium and Mg-Zn and Mg-Li-Y alloys display good corrosion resistance with low corrosion rate and maintained integrity after 28 days of immersion in Hank`s solution.

**Keywords :** magnesium alloys, severe plastic deformation, corrosion, biodegradable alloys

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