







extrusion direction. However, further increase of extrusion ratio has a little influence on grain refinement and the improvement of mechanical properties of the alloy. Dynamic recrystallisation is the main mechanism of grain refinement during hot extrusion. Raising extrusion temperature results in grain coarsening. Grain shape becomes more equiaxed-like with raising extrusion temperature. At the same time, mechanical properties decrease with the increase of extrusion temperature [21].

#### D. Mg-RE-Ag series alloy

Silver in the magnesium solid solubility is bigger, and the highest can amount to 15.5%. Ag to join in the Mg after clearance solution way into magnesium lattice, cause lattice happen non spherical symmetric distortion, produce strong solid solution strengthening effect. Ag and RE when join can improve alloy high temperature tensile and high temperature creep performance. Bai [22] have researched the effects of Er element on microstructures and fatigue fracture behavior of an Al-Cu-Mg-Ag alloy. Microstructural examinations revealed that the precipitation kinetics of  $\Omega$  phase was distinctly retarded by promoting the formation of  $\theta'$  phase with the Er addition during the initial aging. The fatigue crack propagation resistance of Er-containing microstructure was significantly enhanced arising from the presence of the crystallographic secondary cracks, which was directly relative to the large grain size. Results also suggested that the dendritic substructure of as-cast Al-Cu-Mg-Ag alloy was refined remarkably by Er addition [22].

#### V. CONCLUSION

As can be showed that the heat resistant magnesium alloy still existed insufficient heat resistance or poor comprehensive mechanical properties and the processing property except heat resistant magnesium alloys with Mg-RE. The heat-resistant magnesium alloys should be in accordance with the following design and development ideas to adapt to the actual application from the angle of the need of the development.

(1) Little multi-component alloying is effective ways to improve the performance of heat resistant magnesium alloy included the properties of the heat resistance, mechanical properties, corrosion resistance. The research core of the low cost and high performance heat resistant magnesium exerted their interaction between many series alloy elements and trace elements in order to the alloy properties.

(2) The alloy manufacturability was improved in order to industrialized production, and the melt purification, casting and forming new technology were researched in order to improve the comprehensive performance of heat-resistant magnesium alloys. The dispersion strengthened magnesium alloy and the magnesium matrix composite materials and some new technology included the rapid solidification, the semi-solid technology will develop the new field for the new development and application of heat-resistant magnesium alloys.

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