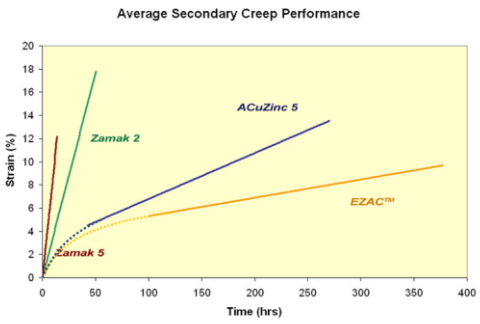
AME7: Hot Chamber Die-Casting and Creep Testing of New Zinc Alloy: Phase IV
Team Composition: ME/MET, MSE
Sponsor: Eastern Alloys



Project Description: Eastern Alloys (EA) is a leading producer of zinc die-casting alloys, ranging from the general purpose Zamak series to the high strength ZA series. ZA alloys are strengthened by additions of up to 27% aluminum, but this aluminum is corrosive when in contact with ferrous alloys including the melting pot of a hot chamber die cast machine. This requires the use of a cold chamber die casting process, which increases the cost and complexity. EZAC is a new zinc alloy containing aluminum and copper that achieves high strength and creep resistance without being corrosive to ferrous alloys in a molten state. This project is a continuation of the project last year in which extensive creep data were collected. One issue observed during creep testing was the failure of the samples in the same location within the gage section. This issue may be related to defects within the sample caused by improper gating and venting of the die. Temperature distributions within the furnace during creep testing exacerbate this condition. The project this year is to design a new gating system using MAGMASOFT's die-casting module, fabricate the die, and then test the samples in a constant temperature environment. High quality creep data will be utilized by Eastern Alloys to help design engineers properly select and design with zinc die-casting alloys.