

# Studies of Microstructures and Mechanical Properties on Al-Si Alloy(A390) using Grain refiners and/or Modifier

Satya Prema<sup>1</sup>, Murali G.E<sup>2</sup>, T.M Chandrashekharaiiah<sup>1</sup>

<sup>1</sup> Research centre, Kalpataru Institute of Technology, Tiptur, 572 202, India.

<sup>2</sup> Mechanical Engineering Department , J N N College of Engineering, Shimoga, 577204, India.

**Abstract:** Aluminium Silicon metal has taken the major importance in industrial components development. Many investigations and experiments resulted in much more alloying elements to commercially available Aluminium Silicon alloy. This paper is an effort to contribute the additional concept to it. Here the experimentally selected commercially available Aluminium alloy A390 (hypereutectic, >13% Si) is grain refined and modified by master alloys. The indigenously developed Grain refiners (Al-5Ti-1B & Al-3B) and commercially available modifier (Al-10Sr master alloy) were used in the present study. The cast alloys, grain refiners and modifier were characterised by using SEM. These master alloys were individually added to A390 alloy during casting. These casted alloys were tested using computerised Universal testing machine (UTM) to assess percentage elongation, ultimate tensile strengths (UTS) and micro Vickers hardness test results were taken. Later it was observed for its microstructure through SEM, observations has revealed that coarse  $\alpha$  – Al dendrites refined to coarse equiaxed dendrites and primary silicon present in the A390 alloy has reduced its shape and size. Due to this improvement in mechanical properties were observed.

**Keywords** Al-Si alloy, grain refiners, microstructure, UTM,UTM,

IJSER