

EFFECT OF TIN AS ALLOYING ELEMENT ON GREY IRON AUTOMOBILE CASTING

Himanshu Shekhar Mishra*, Rina Sahu**, D S Padan*

*Foundry Division, Tata Motors Ltd. Jamshedpur, Jharkhand-831010, India

** Department of Metallurgical & Materials Engineering, NIT, Jamshedpur, Jharkhand-831014, India

ABSTRACT

Presently Engine castings are made in grey iron which has UTS around 250 MPa. Requirement is to make grey cast iron with higher strength without losing grey cast iron properties which is thermal conductivity and damping capacity. Objective is to develop High grade cast iron by adding alloying elements. Base iron was made in medium Frequency induction furnace .Furnace was charged with medium carbon steel and foundry returns .Carbon and silicon made up done in furnace by adding carburizers and ferro silicon alloys during melting. Hot metal taken in ladle and alloy addition tin (Sn) had been done. Sample bar made and some inoculation Fesi done before pouring into sample mould. Base grey iron was alloyed with tin in the range 0.01-0.100 wt % . Test bar samples had been made in the different tin percentage range keeping copper constant in the range 0.45-0.5 wt %. Tin was added in grey iron to study mechanical properties and microstructural properties. Tensile, Hardness and Impact test had been performed and for microstructural properties study had also been done for different composition range. Tensile strength increased upto 253-376.11MPa, Hardness upto 173-222.33 BHN and impact strength upto 3.33-4 Joules from notched charpy test.

Keywords – Base grey iron, alloying elements, copper, tin, test bar sample, microstructure

