VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI 590018

A project report on

STUDY ON EFFECT OF METALLIC MOULD GEOMETRY ON SOLIDIFICATION BEHAVIORS OF Sn-Cu ALLOYS

Submitted in partial fulfillment of the requirements for the degree of

BACHELOR OF ENGINEERING

in

MECHANICAL ENGINEERING

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2023 – 2024

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CERTIFICATE

Certified that the project work entitled **"STUDY ON EFFECT OF METALLIC MOULD GEOMETRY ON SOLIDIFICATION BEHAVIORS OF Sn-Cu ALLOYS"** is a bonafide work carried out by

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ABSTRACT

In order to improve the mechanical properties of alloys there are various parameters to be considered such as alloying element, cooling media, melting temperature, mould temperature, cooling rate, geometry of moulds, type of casting mould etc. Among this mould material and their geometry are considered as important parameters. In this regard, in the present investigation liquid Sn-Cu alloy melted from 700°C was allowed to solidify in pure Al and Cu metallic mould geometry of square and hexagonal shapes. The further solidified alloy was subjected to determine the mechanical property (RHN) from one end of the corner to another end of the corner of the casted alloy (diagonally). It was observed that alloy cast in the square mould of Cu exhibited the highest hardness, whereas alloy solidified in the hexagonal mould of Al geometry exhibited the highest hardness. In overall, alloy solidified in hexagonal mould showed higher hardness than alloy solidified in a square mould. Thermal mapping simulation studies were carried out using Fusion 360 software. Results indicated that hexagonal moulds having more corners exhibited higher thermal stress and heat flux than alloy solidified in square moulds.

Keywords: Sn-Cu, Alloy, Mould Geometry, Solidification, Microstructure, Harness, Heat flux