

## **Design and simulation on investment casting mold for metal matrix composite material**

### **ABSTRACT**

This paper presents the design and simulation on investment casting mold for metal matrix composite material. The study was investigating the design parameters for the casting mold and simulated the temperature and pressure on the mold. Compressor impeller selected as the product of the study. Among the various types of casting techniques, investment casting process is the most suitable process to produce the compressor impeller. The alternative design of casting mold of investment casting was generated using CAD software. Concept scoring was prepared to select the suitable design for the investment casting process. Material selection of compressor is Aluminum Silicon Carbide. Stainless steel AISI H13 is selected as the material for the mold. The parameter for the mold design is included branch, gating, sprue and runner. The analysis was presented to the mold by using ANSYS simulation tool to determine the temperature and pressure of the mold. In addition, three case studies were presented and compared the static pressure in different velocity and temperature of the mold design. The result showed the runner and the branch size were important to produce the molten metal flow into the mold pattern. As a result, the design of investment casting mold was proposed.

**Keyword:** Design; Simulation; Investment casting; Mold; Metal matrix composite