



PATTERN DESIGN FOR INVESTMENT CASTING

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Thank You.



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ABSTRACT

Investment casting is an advanced metal forming process used to produce metal parts of the highest quality, functionality and cost-effectiveness. Investment casting is a one-to-one process in which one disposable pattern produces one metal part. When combined with modern production knowledge and technologies, investment casting can be applied to produce parts of varying degrees of complexity, in virtually any volume and for the broadest possible spectrum of applications.

Our project paper is based on new pattern design, which focused for the pattern and new style for UiTM Pulau Pinang. The main purpose of this project is to minimize the cost making the die and produce flexibly for any type of patterns.

We also want to study about investment casting process. We designed a simple FKM souvenir for Faculty of Mechanical Engineering. The souvenir that we had design is a prototype with 1:1 scale. The patterns are designed for to add the pattern that available at UiTM Penang foundry workshop. In this project we use a polystyrene to make the pattern. We don't use the wax to make the pattern because we don't have a complete equipment to make their mold. Furthermore the cost to build the mold is very expensive. The material use for this souvenir is 100% pure aluminium. We have given all of our best performance to achieve the fully satisfaction in this project. However the patterns that we designed are still not a perfect creation and still need much of modification. So, we hope that this project will be a great and useful in the future with suitable correction and improvement.



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CHAPTER 1

INTRODUCTION OF INVESTMENT CASTING

1.0 DEFINITION

1.0.1 WHAT IS CASTING?

Casting is a process by which a material is introduced into a mold while it is liquid, allowed to solidify in the shape inside the mold, and then removed producing a fabricated object, part, or casing. Casting is often used for creating one or more copies of an original piece of sculptural (three-dimensional) artwork. It is also used extensively in the automobile manufacture industry, such as the casting of engine blocks or cylinder head, or vacuum-forming of plastics and in the lost core process. The process, particularly when performed with molten metals, is also called founding.

Casting may be used to form hot, liquid metals or meltable plastics (called thermoplastics), or various materials that cold set after mixing of components such as certain plastic resins (e.g epoxy), water setting materials such as concrete or plaster and materials that become liquid or paste when moist such as clay, which when dry enough to be rigid is removed from the mold, further dried, and fired in a kiln.

The investment casting process is ideal for the production of high quality metal castings made from aluminum, steel and exotic alloys. Investment casting is generally used for small castings, often less than 500gm, although steel castings up to 300kg and aluminum castings of 30kg are can be produced. As compared to other casting processes such as sand casting or die casting, investment casting is a relatively expensive process, but it has versatility and precision unmatched by few other metals forming processes. Intricate or re-entrant contours can be incorporated so that great freedom of design is

