

ACRYLIC PATTERN FOR SAND MOULD

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Abstract

Patterns used in casting process may be made of wood, metal, plastics or other materials. Pattern are fabricated to obtain good standards of product, so that they can last for a period of time, depending to the quality grade of the pattern being produced, and so that they will provide a repeatable dimensionally acceptable casting. The patternmaker or foundry engineer will fabricate sprues, gating systems, and risers that placed with respect to the pattern. The application of wood in making pattern is often limited due to poor mechanical properties such as water absorption and the wood becomes mouldy. However the use of metal for foundry engineering above also often limited due to the high density of metal. This paper presents the use of acrylic as a alternative patterns materials for casting process. Acrylic can be used longer time than wood, free of water absorption, and also light material.

Introduction

In the process of casting or foundry practice, a pattern is a replica of the product to be produced or cast. Pattern is used to provide the cavity in which liquid metal will be poured during the melting or casting process. The pattern needs to allow suitable shrinkage, which is called contraction allowance, depending on the metal to be cast and the accurate casting method being used. Acrylic materials are fast curing and the mixing and casting process for the acrylics is quick and simple. The fast curing rate results from the relatively high rate of heat evaluation during exothermic polymerization but some control of the exothermal temperature rise can be accomplished by varying the sizes of the specimen. Stripping acrylic mounts from metal or glass moulds is also easier.

Experiment

A molding box that consists of cope and drag is prepared to receive the acrylic pattern. Acrylic pattern is produced by machining process. at the bottom, will be filled with prepared sand casting. The sand is packed in through a process called ramming. The pattern is placed on the sand and another molding box segment is added. Additional sand is rammed over and around the pattern. Finally sand mold is bonded or hardened by carbon dioxide gas.

Figure 1 shows the flow chart of making mould from acrylic pattern. The results indicate good product can be produced by acrylic pattern. The pattern can sustain for many process of casting, and cost of the process can be reduced. The pattern also free from water absorption compared to wood pattern. Handling and managing the process

are easier due to the light weight pattern. Better finishing product can be obtained by using this technique.



(a) Acrylic pattern



(b) Moulding box



(c) Sand filling process



(d) Mould after hardening process

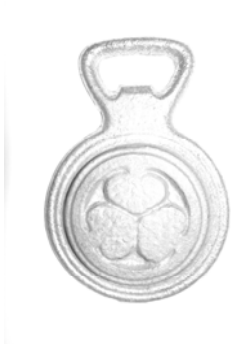


(e) Bottom mould with acrylic pattern



(f) Bottom mould without acrylic pattern

Figure 1 Mould Making Process



a) Bottle cap opener



b) KUKUM logo

Figure 2 Examples of the products produced by casting technique

Conclusion:

1. Acrylic could be used for making pattern as alternative of wood and metal Pattern.
- 2.. Acrylic material is corrosion resistance and also water resistance.

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