

A Review: Development of Plastic Water Container at Plastic Production Unit

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Abstract: All management industries have made continuous efforts to survive in today's boosting and competitive economy. To deal with the critical situation, manufacturers try to implement new and innovative management techniques by making them more efficient. We studied and discussed the process cycle of a plastic product from all its design to its packaging. Also aspects regarding the injection moulding process to produce the product discussed in detail. This review study provides an overview of the arrangements, design and basic concepts of die design. It also provides a better understanding of the basic principle of lean production in order to minimize potential operation and minimize waste. In short, the objective of the process is to design and develop a product and analyze the disposal of waste

Keywords: Injection Molding Process, Development of Plastic Products

1. Introduction

Injection molding is the production technique for the production of parts made of plastic material. Molten plastic is injected into a mold that is the inverse of the shape of the product at high pressure. Injection molding is widely used in the manufacture of a variety of smaller parts compared to whole car body panels. Present study also examines the drivers and obstacles which influence lean production. The results show that most respondent companies are classified as lean production practices in transition. Pro-production from created parametric software was used to develop the machining program in computer-aided manufacturing (CAM).

2. Methodology

A plastic product manufacturing unit was aware of changing market trends and therefore enables us to develop a premium range of plastic products that comply with international standards of quality. The purpose of this study is to study the entire life cycle of the plastic container from design to packaging with every involved process. This will also ensure that the extra raw material used to fill the cavity is eliminated.

In various plastic industries, various molding methods are used, as follows:

1. Extrusion Blow Molding
2. Injection blow Molding
3. Stretch blow Molding
4. Injection Molding
5. Multi-layer bottles

Injection molding:

As for the injection molding machine, several types have been developed to this point, such as plunger type, plunger type pre-plastication, screw pre-plastication and in-line screw type, etc., but currently the in-line screw type injection molding machine as shown in the figure 1. Injection molding uses a ram or screw-type plunger to force molten plastic into a mould cavity, which solidifies into a form that conforms to the mould's contour. It is most commonly used for the treatment of thermoplastic and thermosetting polymers with a considerably higher volume of the former. Thermoplastics are prevalent because they are extremely suitable for injection molding, such as the ease with which they can be recycled, their versatility which allows them to be used in a wide variety of applications and their ability to melt and flow during heating. Thermoplastics also have a safety element over thermosets.

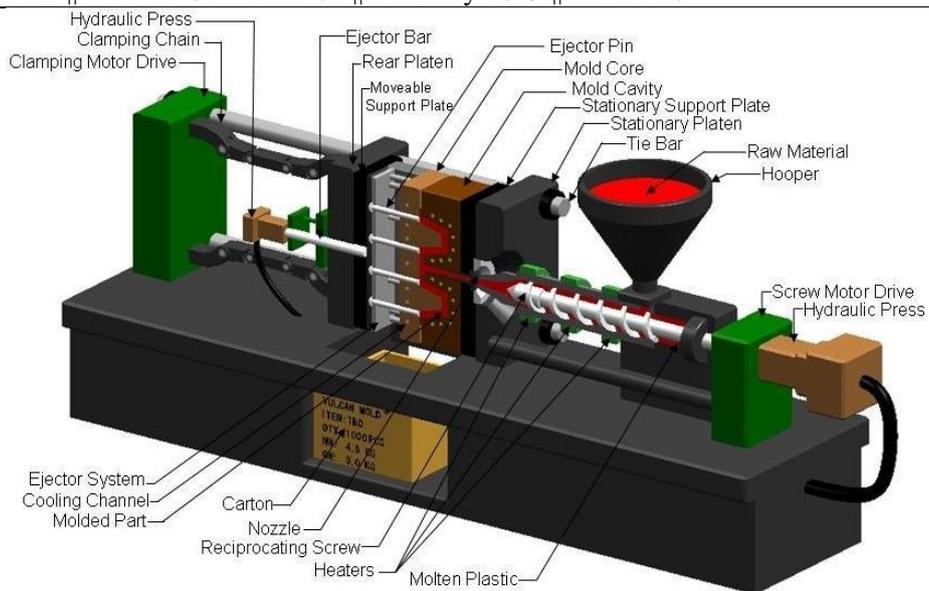


Fig 1: Injection Molding Process

3. Process Plan

Process plan for designing and manufacturing a plastic product at a plastic production unit is as follows:

1. Market Survey & Identification of Product
2. Selection of Raw materials
3. Mathematical modelling and Analysis of product
4. Design and Development of the die
5. Production of product
6. Testing of quality of product (Redesign if failure, repeat process (6) again)
7. Deposition of wastage material and recycling
8. Packaging of product and Finishing.

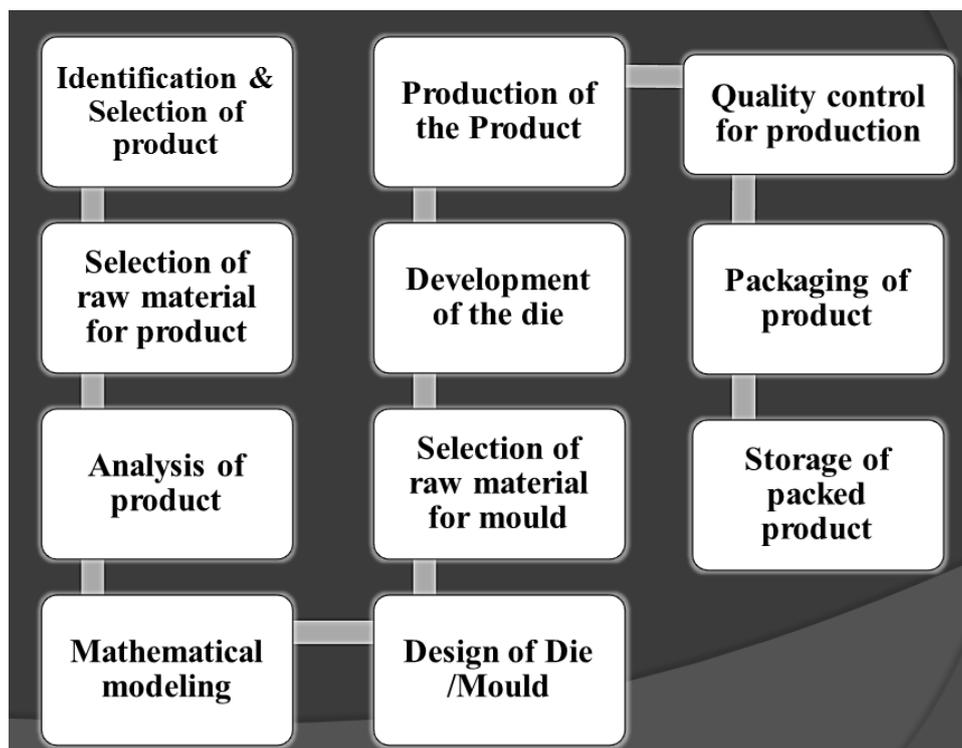


Fig 2: Process Plan

4. Process details

Selection of injection machine:

- **Injection machine selection:** selection by injection volume: the injection machine should generally be selected so that the molded product volume becomes 30% to 80% of the injection volume of the machine.
- **Choose by mould clamping pressure:** each type of switch and direct pressure type is suitable.
- **Structure of the nozzle:** the nozzle of the commercially supplied injection molding machine can be open or shut off
- **Injection Mechanism:** The injection machine functions with constant injection speed and two-stage control of injection pressure.
- **Machine drying:** Preliminary drying before molding is necessary and the condition below is general [120⁰C; 5 to 8 hours]

Hot air circulation dryer type shelf, hopper dryer or dehumidifying dryer is preferred for drying.

To avoid dirt and therefore dirt, a filter should be placed in the drying machine for air intake and its maintenance against clogging is also necessary.

5. Molding Shrinkage Ratio

Molding Shrinkage can take place in the liquid organic compound cooling method. It depends on the mutual effect of many factors and the following are the main factors:

- 1) Resin Temperature
- 2) Mold Temperature
- 3) Injection Pressure
- 4) Injection Speed
- 5) Injection Time
- 6) Molded Product Thickness
- 7) Filling Material
- 8) Shape of reinforcing Material

6. Conclusion

We have therefore studied how to design and build a distinctive and effective household product for low-cost local customers. Develop a product that also brings enormous profits from a capital perspective for the industry. We learned about the approach and method of designing and manufacturing a simple plastic product using mainly injection molding. We have also studied the crucial parameters during the process of injection.

7. References

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