

Design of Ceiling Cable Holder Base

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Abstract- Injection moulds are classified into two types based on runner design (i.e.) Cold runner moulds and Runner less moulds (i.e.) hot runner moulds. In cold runner moulds, for multi-cavity and multi-point injection moulds, there is wreckage of material in runner area. Also wastage of material is more than component weight. To overcome the above problem, the technique used is hot Runner moulds. Hot runner mould is one of the improved manufacturing technique for multi-cavity type moulds. This types of moulds are commonly used for large production rate. While producing plastic components using normal/standard multi-cavity mould, we are facing the problems like partial filling, cavities in components, less product quality, injection pressure and temperature reduction and warpage etc. Thus we are redesigning the holder base by doing some modification in and this will be beneficial for our using purpose. We are making design of the component, mould flow analysis using software Solid works.

Index Terms- mould, core-cavity, warpage, injection, etc.

I. INTRODUCTION

In the injection moulding process, clamping force should be constant till the material is solidified and is ready to be ejected from the mould. This is the vernacular and preferable way of producing plastic products with any complexity and size.

The runner system balanced the molten plastic material receiving from the barrel and guides it into the mould cavity. Its configuration, dimensions, and connection with the moulded part influence the mould filling process and, therefore, largely the quality of the product. We can say, the runner system shows part quality and productivity. Runner systems in ordinary moulds have the same temperature level as the rest of the mould because they are in the same mould block. The best injection moulding system produce moulded parts of uniform density and free

from all runners, flash, and gate stubs. To obtain this, a hot runner system, in contrast to a cold runner system, is employed. The material in the hot runners is preserve in a molten state and is not ejected with the moulded part. Unlike an ordinary cold runner, the hot runners are heated, so the plastic melt in the hot runners never solidified.

II. OBJECTIVES

The prime objective is to design the Injection Mould tool to produce good quality Component and economically and also:-

- Design and Analysis of Ceiling cable Holder Base
- To improve the aesthetic view and reduce material wastage.
- Provide strength to the holder base.
- Applying a shrinkage to the part material, geometry and moulding conditions.
- Make conceptual design of mould.

III. MODEL STUDY AND MODELLING OF COMPONENT

Model study includes identifying the problems in Component, following are the problems involved in component

- Proper ejection method required to eject the component.
- Extra material wastage due to rectangular shape.
- Looks odd when fitted with the holder, as shape of holder is circular.
- Less attractive aesthetic view.
- Warpage occurs on flat surface.

$$N_s = 5.08$$

$$\approx 5$$

Plasticizing Capacity

$$N_p = (0.85 \times P \times T_c) / (3600 \times M)$$

Where,

N_p :- Number of Cavities Based on Plasticizing Capacity.

T_c = cycle time

M = Mass = 10 gram.

P_s :- Plasticizing Capacity of Machine
= 6.1 kg/hr

Q_A - Total Heat Content of Polystyrene.

Q_B - Total Heat Content of Material.

$$P = (P_s \times 3600 \times Q_A) / (1000 \times Q_B)$$

$$P = (6.1 \times 1344 \times 3600) / (1932 \times 1000)$$

$$P = 15.27 \text{ Kg/hr.}$$

$$T_c = (M \times 3600) / (P \times K)$$

$$T_c = (10 \times 3600) / (15.27 \times 1000)$$

$$T_c = 2.357 \text{ second.}$$

$$N_p = (0.85 \times P \times T_c) / (3600 \times M)$$

$$N_p = (0.85 \times 15.27 \times 2.357 \times 1000) / (3600 \times 10)$$

$$N_p = 4.37 \approx 4$$

Determination of number of cavity

From the above calculation of component and its shape and size 4 cavity moulds is preferred.

V. TOOL ASSEMBLY

Tool assembly is done in modeling software, includes the positioning of extracted core and cavity inserts into the mould base, after assembly 3D models are converted into the 2D drawings for manufacturing process.

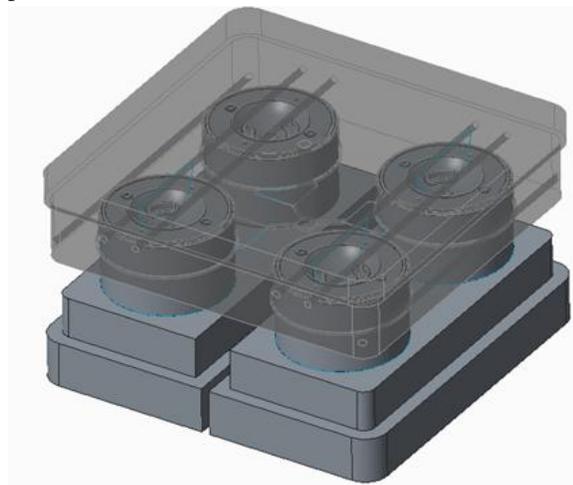


Figure No.4 Core Cavity Extraction



Figure No. 5 Assembly of mould tool.

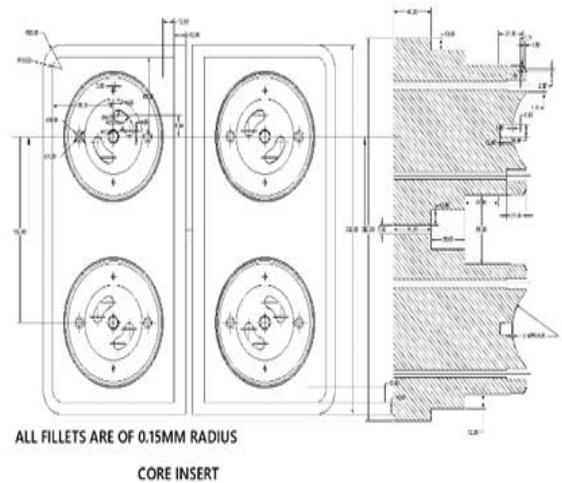


Figure No.6 Drafting of Mould Assembly

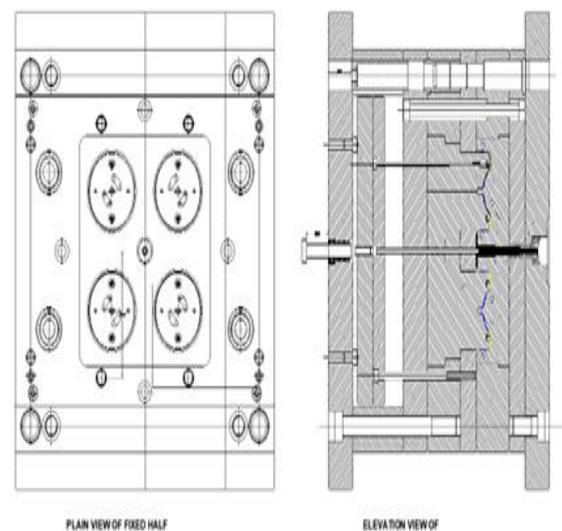


Figure No.6 Drafting of core insert

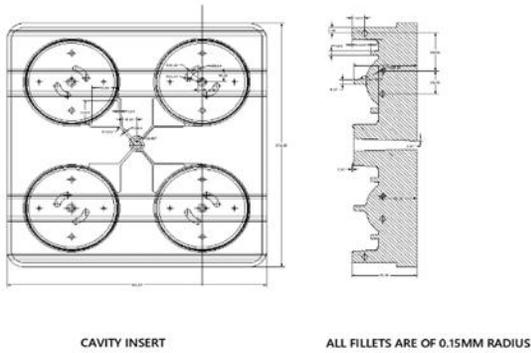


Figure No.7 Drafting of Cavity Insert

V. CONCLUSION

In this project, we carried out the Design of Ceiling cable Holder Base. The complete injection mould tool is designed for fabricating holder base by using solidwork. All the components of assembly has fitted smoothly and shows no error.

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