

Analysis 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 doing, mould flow analysis using software Solidworks.

KEYWORDS: - mould, core-cavity, warpage, etc.

1. INTRODUCTION

In Injection molding, a high pressure fluid polymer is injected to the impression formed in the mold by using injection molding machine. The injection cycle starts when the mold closes, followed supervene by the injection of polymer into the mold cavity. Once the cavity is filled, then the part is sufficiently cool, the mold opens and the part is ejected.

CAE software is used for mold flow analysis. Firstly the specified product is designed using 3D mechanical software. After the product and mold preparation import the models into mold flow software for analysis and simulation. It can show the result of injection molding for plastic in designed cavity, find the different problems in them and modify. It proved that numerical simulation

technology in injection molding played a key role in quickening new plastic product development, increasing plastic quality and reducing the cost.

2. OBJECTIVES

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

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

3. 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



Figure No.1 Existing Component

Component is modeled using the software SOLIDWORK Component has a circular in structure with following dimensions:

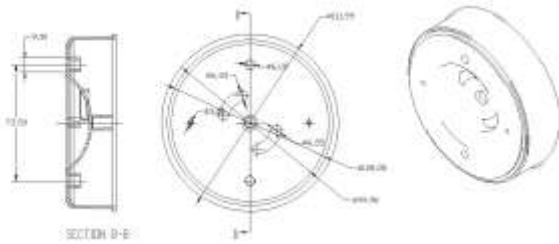


Figure No.2 Dimension of Holder Base.

Other details of model are given below:-

Component name: Holder Base

Component material: PP (polypropylene)

Shrinkage: 1.5

Moulding type: Four Cavity injection mould tool



Figure No.3 3D model of Knob.

4. MOULD FLOW ANALYSIS

It is required to do the mould flow analysis for the particular component to know the proper filling and any other defects coming during the filling process of the component. To locate the proper gating system and melt temperature of the material in which injection process takes place. Following are some images of analysis.

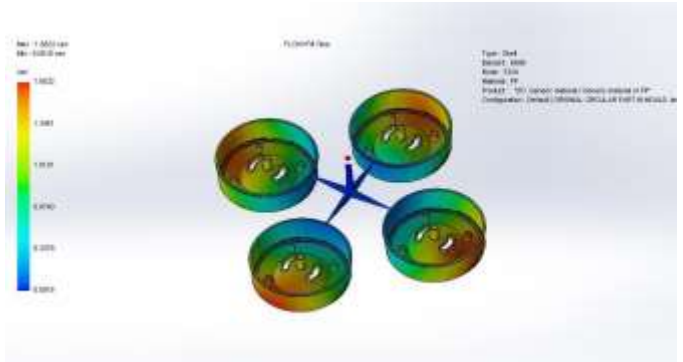


Figure No.4 Analysis of Filling Time

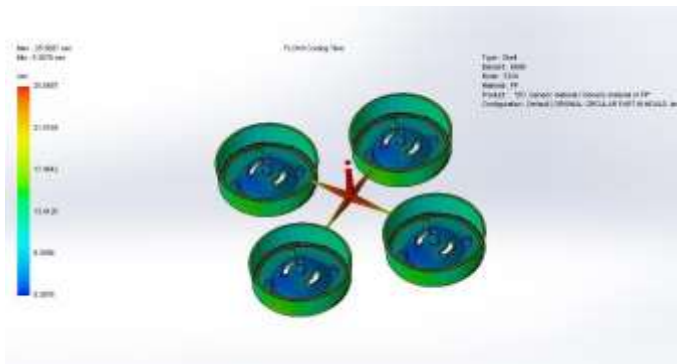


Figure No.5 Analysis of Cooling Time

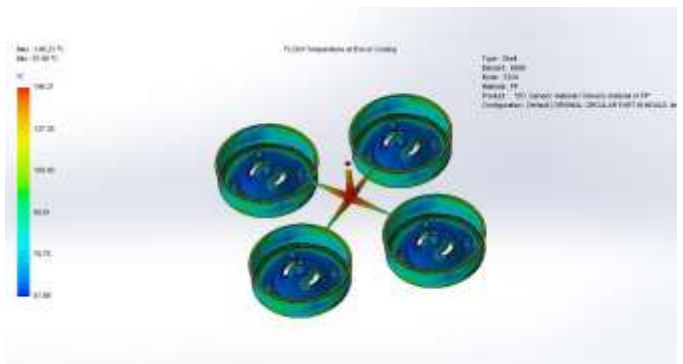


Figure No.6 Analysis of Temperature at the End of Fill

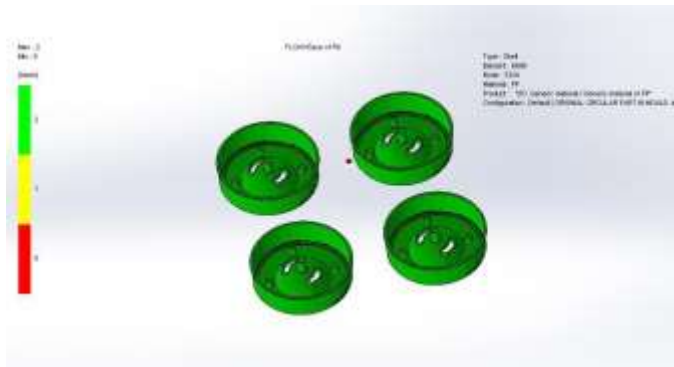


Figure No.7 Analysis of Ease of Fill

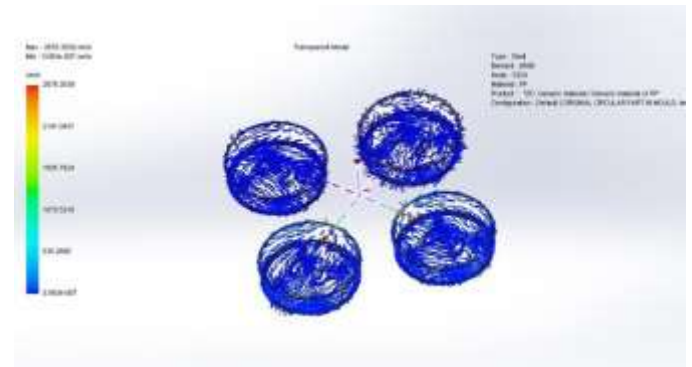


Figure No.9 Analysis of velocity vector at the end of fill.

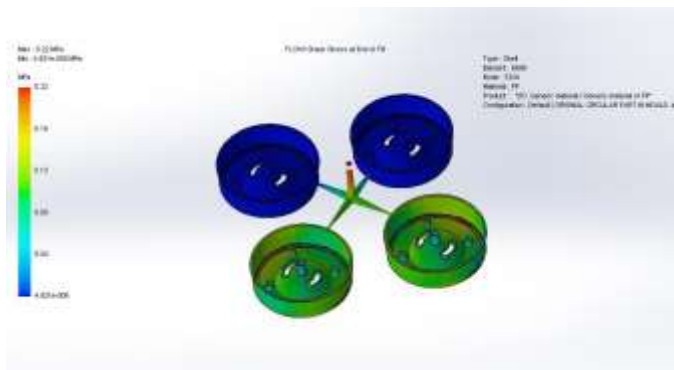
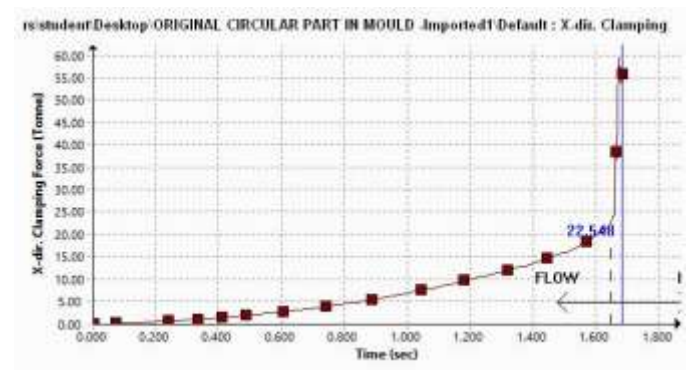


Figure No.8 Analysis of shear stress at the end of fill.



Graph No. 1 X Direct. Clamping Force Vs Time

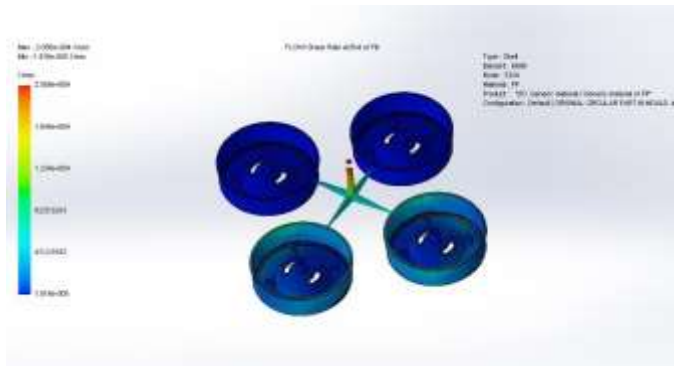
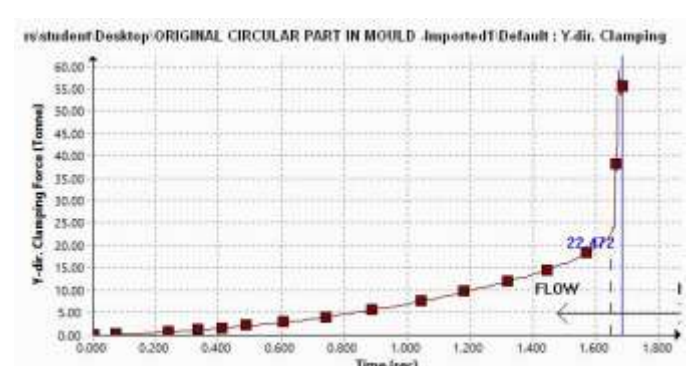
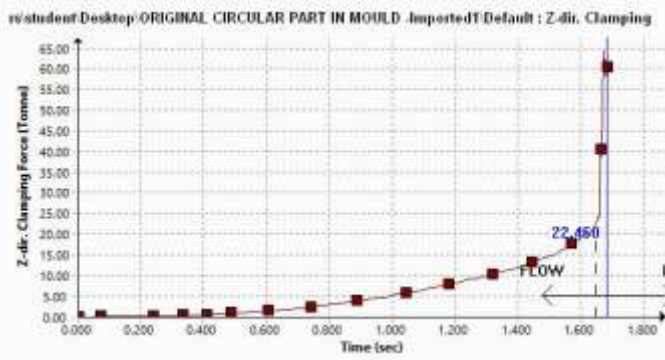


Figure No.9 Analysis of shear rate at the end of fill.



Graph No. 2 Y Direct. Clamping Force Vs Time



Graph No. 3 Z Direct. Clamping Force Vs Time

5. CONCLUSION

In this project, we carried out the Analysis of Ceiling Cable Holder Base. The complete injection mould tool is analyzed for fabricating holder base by using solidwork. The plastic flow analysis is carried out using solidwork. All the results viz. fill time, temperature at the end of fill, weld lines, air traps, Ease of fill prediction are analyzed and it has not shown any error in the mould flow analysis.

6. REFERENCES

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