

















**Figure 6.2.3 (a) Punch of the mould**

The Figure 8.4 (b) shows the punch / fixed half / injection half of the mould. The cavity inserts were also made with the H13 tool steel. The picture in the Figure 8.4 (b) was taken while the mould temperature was measured. The punch half of the mould consists of punch inserts, bolster assembly and the feed system. Both halves were provided with cooling channels for effective maintenance of the mould temperature.



**Figure 6.2.4 (b) Cavity half of the mould**

While moulding with the optimised settings, flashes appeared at the parting surfaces. Hence, a decision was taken to reduce the mould temperature and it was set at 57oC to arrest the flashes.

The sink depth for the optimised set of variables was predicted as 0.0236 mm through simulation.





Figure 6.2.5 Improved sample of the component

Figure 8.5 shows the improvement on the product with respect the sink mark after the application of the proposed methodology by fixing the process variables, as deliberated earlier. The sink marks along the ribs were measured. The observed sink depths at surface were found to be  $0.026 \pm 0.003\text{mm}$ . Figure 8.6 shows the comparative results at a glance. It was observed that the predicted sink depth deviated from the observed value by 0.002 mm. It is noted that

Table 6.1.1: Total Material Cost

S.NO	PART NAME	MATERIAL SPECIFICATION	PRICE
1	Cavity plate	225×225×30 mm=5.30×2=10.6kg Material used is HCHCR	200×10.6=Rs.2120
2	Cavity back plate	225×225×30 mm=2×7.21=14.42kg Material used is mild steel	60×14.42=Rs.865.2
3	Ejector plate& retainer plate	90×90×20=2×1.27=2.54kg Material used is mild steel	47×2.54=Rs.119.38
4	Ejector pins	Qty-4 Material used is Mild Steel	65×4=Rs.260
5	Retainer pins	Qty-4 Material used is EN8	550×4=Rs.2200
6	Guide pillar and guide sleeves	Qty-4 Material used is carbon steel	450×4=Rs.1800
7	Sprue bush	Material- EN8	Rs.400
TOTAL MATERIAL COST =20% ALLOWANCE			
			Rs. 8164.58
			+ Rs.1632.90
			-----
			Rs.9796.91/-

➤ **Total Die Cost:**

- Material cost = Rs. 9796.91
- Machining cost = Rs. 25060
- Transportation = Rs. 1000
- Total cost = Rs.35856.91 /-

➤ **Total component cost:**

- Raw material cost = Rs. 1.15/-
- Moulding cost = 1.30 Rs/piece
- Rejection = Rs.1.45  
(7% on material cost and moulding cost)
- Profit (12% on cost) = Rs.1.1
- Total cost = Rs.5/-

**Table 6.1.2 Final Product Cost**

Price of single component	Rs.5/-
No. of components	200000
Cost of components	Rs 7,80,000/-
Total cost	Rs 10,00,000/-
<b>Net Profit</b>	<b>Rs 2,20,000/-</b>

• **Conclusion**

- By this project we optimize the cost of container by using plastic material & the container is used for various applications like household containers, plant tissue culture.
- The Design of the Mold and the processing parameters has an influence over the quality of the component produced.
- Hence while designing a mould, the needs to take many factors into account such as material, type of gate selection and position of gate, feed system details like gate size, sprue dimension & runner dimension and various defect such as warpage, sink mark, air traps and weld line, etc.
- As per every comparison and market survey we conclude that plastic is suitable material for manufacturing a container.
- As per processes comparison and selection manufacturing of plastic container is economical and easy by using plastic injection molding machine.
- As per plastic material comparison polystyrene is best suitable material for its properties.
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