

IM Design Guide - Vacuum (Urethane) Casting

IM Max Size: Parts up to 3000mm

Advantages

- Low tooling costs
- Self coloured parts
- Surface textures
- Fast and allows for design iteration
- Minimal redesign required - undercuts OK, draft not required

Drawbacks

- Silicone molds depreciate with use
- Expensive as volumes increase

Tips & Tricks

- Reduce weight to save costs
- Keep wall thicknesses even
- Add ribs to large flat areas for strength and to reduce warping
- Consider a 0.15% shrink rate

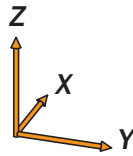
Surface Finishes

- Polishing
- Sand blasting
- Painting
- Plating & more

Materials

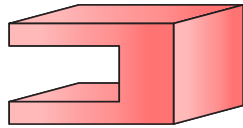
Many polyurethane resins that mimic the characteristics of thermoplastics.

Tolerances - +/- 0.5mm or +/- 0.1mm/30mm whichever is greater.



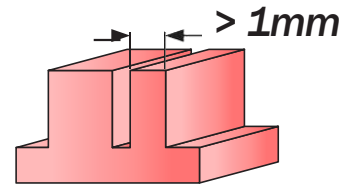
Undercuts - not a problem for vacuum casting and can be done without inserts.

Undercut OK

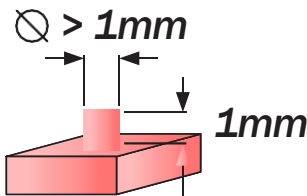


Wall Thickness - varied wall thicknesses are allowed but consistency is recommended. HLH suggests a minimum wall thickness of > 1mm.

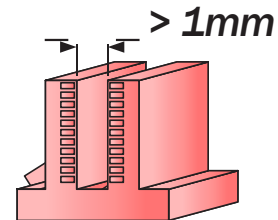
Varied Walls OK



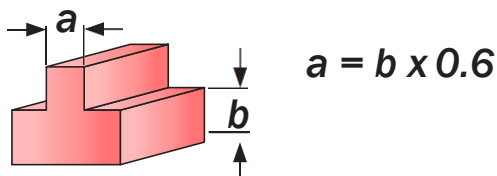
Holes & Bosses - through holes are easy, blind holes less so but can be molded. Threaded inserts via over mold or post process. Bosses should have a minimum height and diameter of > 1mm. Bottom radius $\leq 25\%$ of wall thickness and the walls of the boss $\leq 60\%$ to prevent shrink.



Overmolded Inserts OK



Ribs - ribs should be $\leq 60\%$ of the wall thickness to reduce sink, include as large a radius as can be tolerated.



Text & Logos - recessed or embossed. Text should be $\geq 1\text{mm}$ wide and deep/high and for best result with a 1mm gap between letters.

