

# HLH Design Guide - Vacuum (Urethane) Casting

**HLH 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

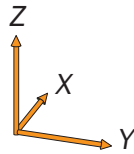
## Surface Finishes

Polishing  
Sand blasting  
Painting  
Plating & more

## Materials

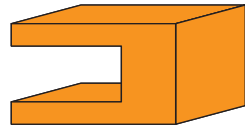
Many polyurethane  
resins that mimic  
the characteristics  
of thermoplastics.

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



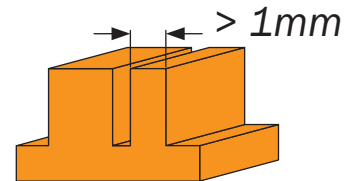
**Undercuts** - not a problem for vacuum  
casting and can be done without inserts.

Undercut OK

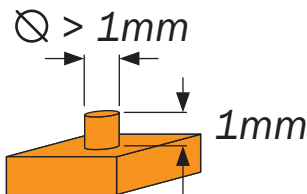


**Wall Thickness** - varied wall  
thicknesses are allowed but  
consistency is recommended.  
HLH suggests a minimum wall  
thickness of > 1mm.

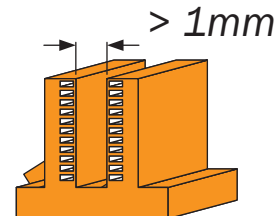
Varied  
Walls OK



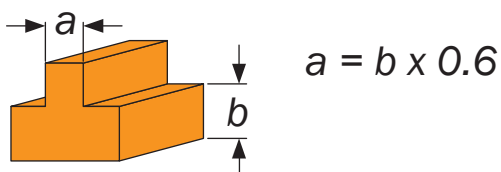
**Holes & Bosses** - through holes are easy, blind holes less so but can be molded.  
Threaded inserts via over mold or post process. Bosses should have a minimum  
height and diameter of > 1mm. Bottom radius  $\leq 25\%$  of wall thickness and the  
walls of the boss  $\leq 60\%$  to prevent shrink.



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.

