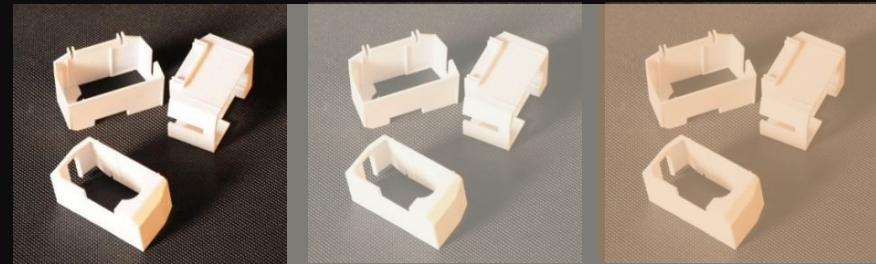


Injection Moulding Guide to Parts Only Service



“Incredibly, Formero managed to design and manufacture 200 quality injection moulds all within a 3 week turnaround. This fantastic service enabled us to deliver a hospital contract over the Easter break with minimal disruption. Truly unbelievable!!”

*Managing Director
Better Health & Entertainment*



Recommended Parts Only Wall Thickness for common thermoplastics

| Plastic Material | Thickness (mm) | Features |
|------------------|----------------|--|
| ABS | 1.14 - 3.55 | Impact resistant, ideal for equipment and handheld housings, susceptible to sink marks when there are thick wall sections. |
| Acetal | 1.00 - 3.05 | Strong, good machinability, very sensitive to excessive wall thickness. |
| Nylon | 1.00 - 2.92 | Very strong, susceptible to shrink and warp, absorbs water - dimensional and property change. |
| Polycarbonate | 1.02 - 3.81 | Very tough, good dimensional accuracy, susceptible to stress cracking or voids |
| Polystyrene | 1.00 - 3.81 | Hard, clear, brittle but can be toughened. |
| Polyethylene | 1.00 - 5.08 | Soft, chemical resistant. |

Designing plastic parts is a complex task involving many factors. "How is the part to be used and how does it fit to other parts?" The design also needs to consider the moulding process. How the molten plastic enters, fills, and cools within the cavity to form the part? This can drive the success or failure of a part. Adhering to some basic rules of injection moulding part design, will result in a part that is easier to manufacture and assemble, and will typically be much stronger.

WHAT is Parts Only?

Parts Only is a fast injection moulding service, delivering parts within **2 weeks** for small components and **3-4 weeks** for larger components. Utilising a library of mould bases, steel inserts are fitted based on CAD drawings supplied. The Parts Only service caters for production runs up to 1000+ pieces, with no capital tooling costs, only part costs. Allowing companies to reduce their expenses and claim the total cost of the project.

Parts Only moulding, with no up-front costs and no capital tooling costs.

Benefits of Parts Only

Speedy delivery

No tooling costs apply, only part costs

No capital costs - total claimable expenses

Majority of thermoplastics & colours available

Design validation with real moulded parts

Pre-production

Short-run production, no inventory

Re-placement parts if production line problems

Attention to the six design-for-manufacture rules, will aid to reduce cost and time.

Wall thickness

The most important design requirement for getting good moulded parts is maintaining constant wall thickness. A consistent wall thickness minimises the potential for warped or distorted parts. Wall thickness needs to also be considered when creating screw bosses. Thick sections can cause sink and voids in your part.

Core Parts

Core out parts, eliminates thick walls. If wall sections are thick it can throw off part dimensions, reduce strength and require post-machining, adding to higher costs.

Sink Marks - ribs / bosses

To prevent sink marks in the part, ribs or bosses should be no more than 60% of the wall's thickness.

Warping

Eliminate details that may cause moulded stress, such as sharp transitions, or areas that don't support themselves. Adding ribbing or curved angles will prevent this.

Texture

CAD must be adjusted to accommodate for surface variance. If texture is on a surface that is angled away from the mould opening then no draft changes are necessary. If the texture is parallel, then increased draft is required. Drafting will vary depending on the type of texture. A medium grade of texture (MT-11040) requires 4.5 degrees of draft for 0.07mm texture depth.

Drafting

Creating sloped walls and curved angles makes it easier to eject parts without causing cosmetic defects. Use 1 degree of draft or more.

A rough rule of thumb is 1 degree of draft for each of the first 50mm of depth. And approximately 3 degrees of draft for 50 to 100mm of depth.

