

If you've ever had to make concessions on Vacuum Casting parts because your supplier can't achieve certain detail features, here's the solution.

Drawing on decades of experience in Vacuum Casting, this informative Process Guide describes our approach. We typically keep concessions to the absolute minimum to produce a level of detail quality to satisfy any tool maker's production tooling requirements.



What is Vacuum Casting?

Vacuum Casting is a fast and cost-effective prototyping method that is typically used to produce small numbers (usually up to 20) of highly accurate polyurethane prototype parts.

It is a slightly slower process than SLA alone because of the additional steps involved in the process, some of which are manually intensive. The time to manufacture depends on the desired characteristics of the part, with size being a key factor as this affects the curing time of the material.

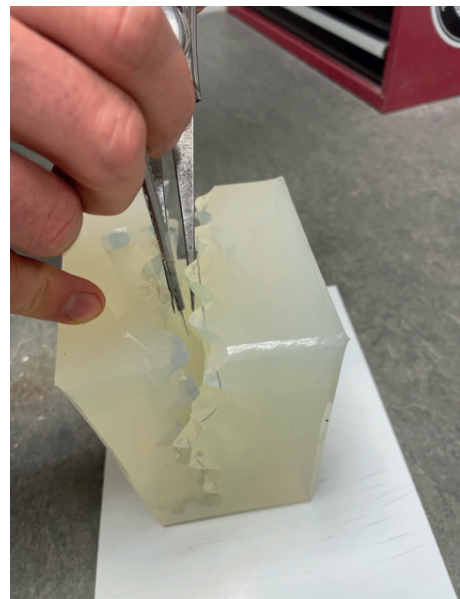
Small numbers of parts are made from a single master mould, which is made using an SLA master model. The mould is made from silicone rubber, and the casting made by pouring resin into the mould in a vacuum chamber.

The result is a bubble free casting, ideal for highly accurate, functional plastic prototype parts in very fine detail which replicate patterns, dimensions, profiles and textures. Vacuum Casting can also produce parts with varying degrees of flexibility or rigidity, in a wide range of colours and materials – as well clear parts.

Vacuum Casting benefits

Vacuum Casting is a fast and cost-effective prototyping method for producing small numbers of highly accurate polyurethane prototype parts.

- ▶ Ideal for functional testing and/or marketing
- ▶ Cost effective
- ▶ Low volume runs
- ▶ High quality
- ▶ Fine detail and accuracy
- ▶ Range of properties can be achieved to mimic the final product
- ▶ No requirement for expensive hard tooling



Vacuum Casting process summary

Process features

- ▶ Ideal for small runs of highly accurate prototype parts
- ▶ Short lead times to production
- ▶ Cost effective, with no requirement for expensive tooling

Properties

- ▶ Heat resistance
- ▶ Colours and tints
- ▶ Fire retardance
- ▶ Flexibility and rigidity
- ▶ UV stability
- ▶ Range of surface finishes
- ▶ Insert options
- ▶ Water clear
- ▶ Flexible polyurethane casting resin grades range
- ▶ Range of finishes from grades of spark texture, smooth matt and satin to a high gloss finish

Material simulations

- ▶ ABS
- ▶ POM
- ▶ Elastomers (Range: 25 - 95 Shore A)
- ▶ Nylon inc Glass Filled
- ▶ Polypropylene

Pre-production applications

- ▶ Ideal Marketing
- ▶ Functional testing
- ▶ Thermal and air flow testing
- ▶ Assembly line trials



About Prototype Projects

We are an expert prototyping bureau providing rapid prototyping and model making services for clients across a range of sectors.

Established in 1980, we have built a reputation for service excellence. We aim to help our clients build and maintain a strong competitive edge in engineering design and production.

Underpinning our commitment to excellence and service quality is an ongoing process of investment in prototyping systems, expertise and technologies.

Our service capabilities include:

- ▶ SLA (Stereolithography)
- ▶ SLS (Selective Laser Sintering)
- ▶ FDM (Fused Deposition Modelling)
- ▶ PolyJet
- ▶ DLP (Digital Light Projection)
- ▶ Vacuum Casting
- ▶ CNC Machining
- ▶ CNC Milling (4 Axis) & Turning
- ▶ Laser Cutting