

Style without risk

There are many designers who know a lot about injection moulding but almost nothing about thermoforming, especially the newer acrylic-capped and co-extruded grades.

DAVID RUSSELL, general manager of David Russell Associates, aims to rectify that

Designers constantly seek ways to make their products stand out from the competition by using stylish plastic panels with self-colour, textured finishes and moulded-in strength instead of metal panels.

Yet many designers are unaware of the styling and strengthening features (such as undercuts) they can now introduce to low volume or large products using the pressure forming process. And, at the same time, achieve significant cash flow benefits and reduced risk!

Thermoforming comes into its own when volumes are uncertain, the life cycle is expected to be short, and when the product is large or has to be introduced quickly – with the added benefit of undercuts! The thermoforming industry has often been looked on as low-tech and black-art manufacturing. This may have been the case 20 years ago, but the process has now come of age and a combination of cutting-edge technology and engineering expertise has resulted in the production of quality mouldings, comparable with other processes – but with much lower risk.

Pressure forming is a simple, rapid and cost effective moulding process which merits serious consideration at an early stage of the design process. It is particularly suitable where:

- Life cycles of less than 10,000 parts are forecast
- The parts are large
- Uncertainty exists as to the viability of the product
- Lead times are tight
- Start-up costs have to be minimised
- Designs are likely to change (soon or during the life of the product).

All too often, price is regarded as the focus of commercial attention, but to minimise the risk involved in launching new products, companies today are required to give detailed consideration to important factors such as cash flow and marketplace uncertainty.

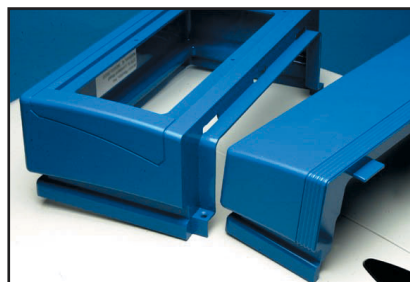
Design dilemma

The dilemma often encountered in the early stages of product design can be demonstrated by one new product which was forecast to sell between 1000 and 2000 units per year and needed five rigid trim panels to give the necessary eye-appeal. The units were roughly 800mm high and 400mm square and the five panels had to comply with the UL94 V0 Self-Extinguishing specification. A comparison was carried out between injection moulding and pressure forming (see the table below).

But what other factors have to be considered before making the decision? One parameter rarely considered is the cost over first two years. In today's economic climate who really can forecast with any confidence? And what are the unseen costs?

Assuming the demand for the product picks up quickly (which is not usually the case) and the forecast 2000 units per annum are achieved, the total cost (tooling plus part prices) over the first two years would be £380k for Injection and £354k for pressure forming, meaning pressure is cheaper by £26k. If the product lasts for another year at the same volume, the costs become £510k (injection) and £522k (pressure), so injection now becomes cheaper by £12k. But what if the product does not reach the forecast

volume or sales are slow to build up – say, an average of only 1000 p.a. are sold in the first two years. The revised



figures for two-year total costs become £250k for injection and £186k for pressure – which makes pressure cheaper by £64k.

Cash flow is a major consideration in today's economic climate. If injection was selected the business would have to make (phased) payments totalling £120,000 over the 20 weeks of toolmaking – some cash will have been handed over five months before the first parts are produced. For pressure forming, the comparative figures are £18,000 over 10 weeks.

The other factor impacting on cash flow is stock. One delivery of the minimum lot of injected parts is equivalent to three months of shipments, if the volume reaches 2000 p.a. but is equivalent to six months of shipments if the volume only reaches 1000 p.a. The amount of cash tied up in stock is significantly higher than for the pressure formed parts which could be purchased and sold in the same month, even at the lower volume.

Design changes are said to take place in 30% of products during the toolmaking phase. And an increasing number of companies are tweaking designs during the life of their products. Any process which offers easy and quick tool modifications will provide an advantage over other processes. Pressure forming offers just such an advantage, with single-sided aluminium tooling which can be quickly and cheaply modified.

For more details on **thermoforming** from David Russell Associates, please use the free information service

More information: Write in 15 on the card or email: it.enquiry@itmagazine.uk.com

Comparison between injection moulding and pressure forming		
	Injection Moulding	Pressure Forming
Price for five panels	£65	£84
Tooling	£120,000	£18,000
Minimum Lot Sizes	500	100
Lead Time to Production	20 weeks	10 weeks