

## The down side of DIY.

### (do-it-yourself plastic bottle blow molding)

Throughout the world nearly all major companies in cosmetics, pharmaceuticals, household cleaners, car care products, beverages and chemicals have at some time or other investigated the feasibility of producing their own plastic containers.

But is it the right strategy? Robin Enderby investigates the feasibility of filling companies producing their own plastic containers .

If you are a bottle user, paying someone else's profit margin to put bottles on the end of your filling line, it must seem very attractive to cut out the middle man and do the job yourself. Lots of companies do. You read about them. But you don't so often read the full story when they pull out again.

Going in-house can be more complex than many people anticipate. On these pages are some pointers to the trip wires. But don't assume the whole minefield has been mapped...

#### Investment required

The primary task of bottle production involves all or most of: blow moulding machines, granulators, hopper loader blenders, chillers, air compressors, distribution systems, labellers and printing machines. But the plant list may be extended with on-line test equipment such as leak testers; bottle palletising facilities (stretch wrappers, conveyors, pallet racking etc); extra handling equipment such as fork lift trucks (for unloading material deliveries); and QC equipment including electronic scales, cap torque tester, digital calipers -- the list is virtually endless if you start to include colour matching equipment, 3D co-ordinate measurement etc.

Beyond the capital cost you may have to provide extra factory heating for operators sitting at machines (warehouse temperatures are too low for sedentary jobs) and there will be a need for staff training at all levels -- production management to understand the effects of, say, mould and colour changes on production efficiency; maintenance engineers in technologies they may be unfamiliar with; existing QC personnel in evaluating the effects of moulding variation on final product combinations (bottle + cap +

sleeve (or print)); and operator training which must include the safety considerations of the moulding machinery.

## Technical support

Companies intending to go in-house would presumably be wise to try and find a person with experience in blow moulding. However, despite recessions and other problems, skilled people throughout the world still seem to be in short supply. And you need someone with the right experience: a person experienced in manufacturing polyethylene washing up liquid bottles does not have the experience to run a PET beverage bottle machine as these processes are entirely different.

It is common for potential 'in-housers' to attract (persuade? poach?) engineers and technical managers from trade moulders, often existing bottle suppliers. The danger here is that despite being a skilled blow moulder, this engineer, or 'technical manager' is frequently thrust into a job he has never done before: planning a factory layout from the ground floor up.

His first job is to order machinery and ancillaries which he will inevitably source from the companies he previously dealt with. He may not look at competitive tenders. Frequently his favorite rep may get the order -- better the devil you know.

And so the honeymoon period begins. It can take nearly three years before this technical manager realises that you see the purpose of your business as making profits by selling hair shampoo based on the market perception of your image.

He will find your negative reaction for further capital expenditure or spare parts exasperating.

It's beginning to dawn on him that you don't intend to be the country's number 1 blow moulder. Departments that feel like poor relatives of the main company suffer from an assortment of problems ranging from a higher than average absenteeism to sheer aggression.

He will certainly seek to return to the blow moulding trade, which may leave your in-house operation in a difficult position.

## Reduced flexibility

In-house blow moulders usually choose to concentrate on producing their highest volume product requirement. In theory, this should be the most efficient mode of operation. In practice it can create two separate problems.

\* Assuming the mouldings are natural or white (as they usually are) the 'in-houser' will not have any use for slightly contaminated scrap. Trade moulders frequently have some dark coloured jobs they can 'dump' scrap material into. The market value of contaminated scrap can be as low as 10 - 20 per cent of that of virgin material, so material cost losses on purging and production startup can be 80 - 90 per cent.

\* A machine fully committed to one moulding is incredibly vulnerable to variations in demand. For example, if order levels increase, a fully committed machine cannot give you more production. And if quantity requirements drop to a level of only four days a week production run, you won't bother to do a mould change on the fifth day. You will thus end up accepting an extra 20 per cent loss in efficiency.

Sales of a product can actually be limited by machine capacity. The only way to deal with abnormal peak requirements (not to be confused with seasonal trends) is surplus production capacity and warehouse space. Space costs money, and this cost should be included into the viability study. Remember, production overcapacity can't now be solved by sending a truck load of bottles back to the supplier because your QC conveniently found a bottle 2 grams under weight!

Bottles stored for a long time in a warehouse, no matter how well packed, seem to get dirty. The cost of wiping each bottle should be added into the viability study.

## Support from the machine supplier

Some blow moulding machine manufacturers sell through their own local subsidiaries or through a commissioned agent. The quality of technical service support varies tremendously from fully trained experienced staff to no resident engineers at all.

In the latter case you can phone the machine manufacturer directly and experiment with your ability to describe a technical fault in your best Spanish, Italian, German etc.

Whatever the arrangement, you should consider the cost of manufacturers' assistance. Their on-site service charges include travel, hotels, expenses, time etc. A weekend service visit can cost 800 [pounds sterling] -- without parts. This can make the next 80,000 bottles you produce more expensive than 'trade price'.

You should not assume that an engineer will be available immediately. Next day availability may mean up to 24 hours lost production.

#### Secondhand machinery

Most trade blow moulders only dispose of machines when they feel the machine has come to the end of its useful life, or that the cost of refurbishing the machine is too near its replacement cost. Some secondhand machines appear on the market as a result of companies closing down and these machines may be of reasonable quality. Of course, it is also possible that unreliable machines may have caused the company's demise.

Whatever the reason, secondhand machines should be selected with great caution. Ask the machinery manufacturer what spares he carries for the machine you are considering. Are seals and pumps still available?

Starting any new venture is difficult and can be made impossible if the machinery is a pile of junk!

#### Market shifts

Justifying investment to go in-house usually assumes that the market is either constant or growing. For example, to buy a machine for dairy bottles when there is a shift towards sachet or cardboard is against

normal management philosophy. Fortunately, in most countries plastic bottles are still taking an increasing share of the dairy market for 'user friendly' reasons.

Neither Lever Brothers nor Proctor & Gamble blow mould bottles in the UK, despite constantly re-evaluating the viability of going in-house. Did they foresee the 'green movement' wards detergent packs? Did they create the shifts?

#### Partial in-house operations

Many 'in-housers' continue to buy some of their bottles from trade blow moulders. This is often the 'fag end' of their requirements -- shorter runs, colours I and technically difficult bottles.

As with many industries, trade blow moulders tend to take the rough with the smooth. This means they accept the less profitable job to keep the volume business. Because the natural tendency is for in-trousers to start operations with core product bottles, trade moulders have often found themselves with unprofitable work. Trade moulders may also feel sufficiently 'snubbed' to seek alternative work for the machines currently producing your 'fag ends'. It is not unknown in these circumstances for trade moulders to send moulds back unexpectedly.

This is particularly true when a trade moulder has recently invested in a machine to handle your increasing requirements, only to find you gave him no warning that you were about to pull the business in-house. Consider the ramifications of an unreliable supply of the bottles you don't make.

#### Evaluating new materials, new machinery, new ancillary equipment

Optimum results are obtained when the correct grade of material is used for the application. For example, the polyethylene grades used for plastic milk bottles, caps and 5 litre jugs are totally different.

By experimentation, trade blow moulders have found that a particular material works better with some machines than with others. For example, bottles made on Uniloy or Magic blow moulding machines may demand totally different makes of material. You will sometimes find the machinery supplier can advise

you of a grade worth trying because he knows what his other customers are using. This is one reason why some blow moulders don't let machinery suppliers in their factories. They don't think their costly experimentation should be just given away to would-be moulders.

Consider costing into the viability study some lost production to experiment with different materials.

Machinery and ancillaries are constantly being improved, and to stay in touch with develop to attend trade fairs. Include into your estimates the costs of visiting Dusseldorf for three days, Chicago two days, Milan two days every couple of years.

Printing, sleeving and capping

If you have been buying printed bottles, then going in-house presumably means you will also have to install print facilities. To prepare the bottle surface for printing, flame or corona treatment is required. You will also discover how the surface finish can make bottles unprintable. Bottles that appeared to be perfectly OK turn out to be scrap. The cost of this scrap goes with you if you go in-house.

The problems of cap fit (and particularly tamper-evident types) have driven many a blow moulder crazy. The theory that two components within allowable tolerances should still fit perfectly ignores tolerance stack-up and shrinkage distortions. Even if `in-trousers' decide not to make caps, their involvement with cap fit will increase.

Raw material supplies

Potential in-house moulders may be under the assumption that obtaining a supply of raw polymer is just a matter of typing out the purchase order. You may not be aware that during times of oil crisis material was rationed in an allocation system. Trying to change suppliers may not help as they all seem to suffer shortages at the same time. This may be related to investigations of cartel activity in the polymer manufacturing industry!

Large users (40 tonnes per day) of material are usually more successful at obtaining sufficient supplies. Companies starting up in blow moulding would be advised to seek alternative sources of supply of suitable grades of material.

### Product liability

The more components you produce in-house, the greater the share of product liability claims you are liable for. An example of this could be a kid squirting 'under the rim' bleach in another kid's eyes if the child resistant closure failed to work.

### Mould trials

In their never-ending quest to maximize product appeal, packaging designers have been known to design difficult or even impossible to mould shapes. Many skills and tricks come into play when trying to get a new mould to run properly for the first time. Certainly hours or even days have been spent getting acceptable quality mouldings. During this time the moulding machine is effectively out of production and the technical manager will be partially unavailable for routine work due to the pressure on him to get the new job running.

At present you probably get this work done for free as most trade blow moulders roll development costs into overheads, so don't forget to add this to the budget.

### Sources of information and advice

Many companies who go in-house ask the advice of blow moulding machinery suppliers. Some of these suppliers produce reasonably well-detailed financial analyses of bottle cost. Some readers may realise this is like asking an insurance salesman if he should sell you a life insurance policy.

Some machine suppliers use 'average running costs' and other data given to them by customer surveys. Like all averages, it is made up with data from the lowest to the highest. As an inexperienced

practitioner beset by some of the problems already outlined, which end of the scale would you guess you would fall into?

## Consultants

Despite the image that consultants sometimes have, there are actually some very good consultants in the plastics industry. Some of the best are retired technical managers or directors who have a lifetime of experience in the industry.

Although generally unbiased, the personal contact some retired blow moulding executives had with executives of machinery suppliers can create a sense of loyalty towards these suppliers.

It should be remembered that there are about six variants of the blow moulding process. A consultant with experience of moulding 25 litre PE drums will not necessarily be the best person to advise on setting up a PET beverage bottle factory.

## Alternative uses of capital investment

Before spending your hard-earned money on a moulding operation, it is worth considering what else you could do with it. You could:

- \* Spend more on advertising and improve your product's image. This may enable you to increase the product price by 3 per cent which may improve net profit more than reducing the cost of plastic bottles.

- \* Employ more sales people. Sell more products.

- \* Open an office or distribution centre in another country.

- \* Part fund some more franchise outlets.

\* Build a creche to help part-time workers.

\* Buy out a competitor.

\* Reduce your overdraft.

You could even invest it in the National Lottery -- the cumulative odds may be better than the chances of a successful in-house operation.

Equipment based on knowledge of the relevant physics

Positive attitude

Never made a produce obsolete

Sensible spare parts pricing policy

we use the most appropriate technology