



Above: Output is controlled by the number of cavities produced on the platen on European trim in place machines, such as Kiefel's

NEW BEGINNINGS

There are numerous views and opinions on the future of thermoforming in the packaging industry. Ken J Braney discusses some expected future trends

The opinions of European and North American thermoformed packaging suppliers and their customers give us a good view of current events and point to future progression.

The history of the European market has been based in two areas, the 'European' thermoforming method and the 'USA' forming method. There are different ways to achieve the same result: more production, less cost and ease of changing from one type of packaging design to another. The materials used during the last 10 years have also influenced the methods of forming and this is one of the reasons why the future is now easier to predict as the material specifications are being influenced by the need for recycling and for material to be biodegradable.

Pressure from politicians and consumers are leading to advances in not only the machinery needed by the suppliers but also the materials being processed.

Manufacturing plants that at one time had machinery that operated for one or two shifts a day and bought in material for processing, have been overtaken by suppliers who are operating their equipment a minimum of 24 hours a day, six days a week. Even the shut-down period normally enjoyed during the summer months is being staggered to allow for maintenance, but on a machine by machine basis, not all at one time.

The European method of trim in place machines produced by companies such as Illig, Kiefel, Gabler and TFT have always had smaller platens and therefore output was always dictated by the number of cavities that could be produced on the platen. The USA method of form and trim separately was always based on larger volume production as the USA base market was much larger and therefore there was a need for more capacity. However, as the European Union grew and more uniformity appeared the need for larger capacity became a require-

ment. Therefore, the European thermoforming machinery suppliers had a problem and they have now started the process that will make their equipment run faster. Where 25-30 cycles per minute was acceptable, they are now looking to run at 40 cycles per minute, which will almost certainly increase up to, and pass, 50 cycles per minute in the coming years.

The USA method was based on the need to have larger production so they always worked at comparable speeds to the old European machines, running at 25 cycles per minute but with at least 20-30 per cent more cavities so they had a much larger output. This was mainly based on the use of HIPS (high impact polystyrene) or PVC, both easy materials to trim outside of the mould, which is why the volume of products was so high and relatively easy to produce.

If you look at a McDonald's cup lid, it is made by forming and trimming separately, which means high volume and constant production. In fact, the USA method was, and is, so successful that it is used in Europe and around the world.

The EU has grown to the same size as the USA and there are now major suppliers outside the two major markets, including those in Eastern Europe, the Middle East, India and Asia.

To compete with these emerging areas of the world everybody has to reduce their costs and improve productivity. The North American way has been to improve their ability to work with new materials, so they have had to overcome the problems of material movement of the PP, from the time it is moulded until it reaches the trim station. This has always been one of the major drawbacks to trimming after forming. The North American machinery supplier also had to look at the overall cost factors to see where else he could make savings and that has now led to more integrated machinery plans

and suppliers will continue to develop complete lines rather than individual pieces of equipment.

The latest versions of lines from North American companies such as Brown combine an extruder feeding directly into a thermoformer, with a robotic system to remove the finished parts and then the waste material is collected and fed back into the extruder. This is a dramatic reduction in waste and it is also a highly efficient line. This type of line, which at one time would have been maintained by a team of workers, can now be handled by one, or possibly, two people. With the cost comparisons between non-USA and European suppliers becoming more important this will become even more vital in the future. The other major benefit is that with one line you can eliminate other lines and it reduces your floor space and reduces energy costs.

In the North American market, food companies are supplying more products that require minimal preparation time. These new food products require packaging; in fact the size of the package is growing, which fits the demographic of the North American types of equipment, namely large platens that allow for large cavities. The current sizes of North American-type thermoformers have moulds that are up to 1.8m in width. In disposable lines there is the capacity to run at more than 200,000 parts per hour, with the ongoing plan to increase this in steady increases to 250,000 before the end of this decade. Volume of this size can only be achieved by inline systems, large platens and high speed machinery.

The thermoforming industry is, however, not only involved in very large capacity supplies. It is also a major part of the medical and point of display (POP) packaging. These also have major requirements that are not just volume. They demand clean rooms, quick change of designs, and clam-style products that are



Above: The US method of forming and trimming separately — shown here on a Brown Machine system — is for larger production. Inset: Tool size is growing

used in a variety of applications.

At the European Thermoforming conference held in Salzburg in 2006, a packaging system that was used for carrying human organs won a prize for innovation. It was built to allow a much longer period of time between donor and the recipient by having a cooling system inbuilt into the packaging system. This is the type of inno-

vation that thermoforming will continue to be part of during the 21st century.

The European machine supplier is the main supplier of this type of equipment as they normally require smaller machine areas while volumes are not yet up to level of the disposal market. However, as this market grows, so will the demand for more volume, and this will

be a challenge for the European supplier with his high speed machine. Companies such as Marbach in Germany are already involved in both sides of the thermoforming machinery market as suppliers of tools. Tool size is growing and the demand will make it even larger in the future. Machines handling 635mm up to 1,270mm will grow to 1.8m in width, and length will grow from less than 1m up to 1.5m.

Thermoforming in packaging covers the whole spectrum of the food, medical, point of display and ancillary markets, from strawberry containers to the most sophisticated micro-medical growth cell device. This means it has a very promising future. ●

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