

# On top form

INCREASING FORMAT FLEXIBILITY AND IMPROVED ECONOMICS ARE CONVINCING MANUFACTURERS IN CERTAIN FOOD CATEGORIES THAT IF THEY ARE TO SURVIVE THE SQUEEZE OF THE MULTIPLES, THEY MAY BE BETTER OFF SWITCHING FROM PRE-FORMED CONTAINERS TO THERMOFORM-FILL-SEAL.

**A**s a technology, thermoform-fill-seal might be well over 30 years old, but there are still areas within the food industry that are only just realising the potential cost savings that it can bring.

According to Jim Campbell, general sales manager, thermoforming and tray sealing, at Multivac UK, one such market sector is fresh convenience produce such as stir fry vegetables and fresh fruit salads in trays.

"If you talked to that market five years ago people wouldn't have known what thermoforming was. Now it's one of our biggest business areas," he says.

The overriding reason for this shift is cost pressure from retail customers. "There's a massive drive from retailers to cut costs," says Mr Campbell. "A lot of our customers are getting the same price for their packs as they were four or five years ago."

The cost savings that can be made by switching from pre-form to thermoform are certainly not to be sniffed at. Jim Campbell estimates that, as a rule, producers are looking at a 25-40 per cent lower pack cost when using a thermoformer rather than pre-made trays.

"The logic behind that saving is that you're not paying the manufacturer to make the tray, an operator to stand at the end of the line and pack the trays into boxes, the lorry driver to take them up and down the country and for you to store them."

If the advantages were so cut and dry, though, there would no longer be a market for pre-formed trays. Thermoforming does still have its downsides, which Multivac is working hard to overcome.

Firstly, there is a widely held belief that pre-formed trays are more rigid than thermoformed trays, so providing greater stability. Indeed, Jim Campbell explains that one of the reasons is that pre-formed trays tend usually to have a rolled edge on the outer circumference of the pack, which is difficult to replicate with



**Rolled edge:** Multivac's new R550 LipForm machine creates a raised flange for food trays

the traditional thermoform-fill-seal process.

While on the face of it, this might not seem significant, the problem is that retailers operate dual supply agreements on most lines, so unless both packers supplying a supermarket go down the thermoform-fill-seal route, it won't happen, because retailers want consistent packaging design.

## Producing the rolled edge

To address this issue, at this year's Foodex Meatex, Multivac launched a new thermoformer which is capable of producing the rolled edge traditionally associated with pre-made trays, allowing existing shapes and sizes of pre-made tray to be copied and transferred to in-line production with all the potential savings in storage, handling and materials.

The new R550 LipForm machine employs Multivac's top-forming technology to create a raised flange above the bed of the machine. Width, depth and incline can all be varied.

Also, since inclined tray side-walls are no longer required for denesting, the machine can produce a pack with virtually vertical sides,

potentially reducing pack size relative to volume for increased shelf utilisation and lower material costs.

Depending on the shape and size of the pack, the dies of the R550 LipForm machine can be configured to have multiple lanes and multiple rows so that, for example, four lanes of three rows could be employed to give 120 packs a minute from the machine's cycle speed of 10 a minute.

## Infra-red heat helps

Ulma Packaging has launched the TF Supra Skin thermoformer for producing display packs of cooked and uncooked meats, fish and cheese. The machine's infra-red top web heating system is said to make it quicker to start from cold, resulting in energy efficiency and reduced costs.

Ulma's UK director, Derek Paterson, says: "There has been incredible interest in the TF Supra Skin because people can see, for the first time, a real alternative for this type of packaging machine – a sensibly-priced option



**Tight wrap:** Fresh meat is one application for the Multivac Form Shrink process

The R550 LipForm can run all standard materials such as apet/pe, eps, mono or multi-layer polypropylene and pvc.

Historically, the perception that it is necessary to be producing thousands of packs a day to make the investment worthwhile has been another barrier to the uptake of thermoform-fill-seal equipment. Multivac for one admits that it has always concentrated on the higher volume end of the market.

However, the company has recently extended its reach to cover the lower volume end of the market, with the introduction of an entry-level thermoformer called the R140 which, according to Jim Campbell, is finding favour with small sandwich producers. "Previously they wouldn't have been able to justify the capital cost of a thermoformer," he says.

The R140 is a fully automatic, stainless steel machine that occupies just three square metres of floor space. It can produce the three pack

types – vacuum, modified atmosphere and protective packs – for applications ranging from sterile packs for disposable syringes to retail packs for fresh meat or maturing cheese blocks. A maximum film width of 420mm, an advance of 300mm (150mm with preheat) and a depth of draw of 130mm make it possible to produce a variety of pack sizes.

#### Dies closed for cleaning

An optional cleaning programme can be incorporated into the system, whereby the dies are closed to protect them from potential bacterial contamination.

The R140 features the Microprocessor Control System (MC-96) which is now standard on all Multivac thermoforming machines. Programme parameters are entered via a simple, easy to use display terminal and up to 50 individual product programme settings can be stored in the memory.

that performs well and which can run equally well with a number of varied film types."

He adds that the TF Supra Skin produces attractive packaging with the product held firmly on a rigid base, with the tight seal avoiding risk of product slippage.

Also, because the top web of film is moulded to the product like a second skin, retailers can display packs upright, giving improved product visibility.

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**Pedestal pots:** Made on the Erca-Formseal system

Another factor that has deterred manufacturers from investing in thermoform-fill-seal is the perception that once you buy a piece of equipment, you're stuck with one pack size and design.

To a point this is true. Chris Robinson at XJL, the UK distributor for French thermoforming equipment manufacturer Erca-Formseal, concedes that it is not possible to combine thermoform-fill-seal with real format flexibility. "It's possible to achieve rapid changeovers on the shape or format of the body of the container, but on a single machine, the top profile cannot be changed. Forming mould changes allow for limited variations in height and width."

Erca-Formseal, whose area of specialism is containers for dairy desserts and drinks, has nevertheless made considerable progress in increasing format flexibility, with its reel-fed EF-Open series of machines for shaped thermoform pots.

According to Chris Robinson, manufacturers of dairy desserts have traditionally steered away from thermoform-fill-seal for single pots, judging the appearance of individual thermoformed containers to be less sophisticated than their pre-formed counterparts.

However, split mould technology developed by Erca-Formseal enables manufacturers to produce more unusually shaped containers such as pedestal pots, goblet pots, bottles and jars, without suffering the expense of high scrap levels.

While split moulds allow thermoformed containers to be produced with a negative taper,

## to accelerate machine start-up



**Cheese skinpacks:** One of the current applications for Ulma's TF Supra Skin thermoformer

such as the pedestal of a pot, the yield from a given length of film is reduced by the distance the moulds must open apart for the containers to clear. Erca-Formseal's solution has been to design a split tooling system in which the cavities are arranged in two rows, offset and interspaced to provide minimum clearance and therefore minimum waste.

The form of any of these containers can also be adapted to take advantage of Erca-Formseal's in-mould labelling system. The machine can be supplied either as a complete FFS unit or as a thermoformer only where manufacturers have existing filling equipment.

Even with the increased flexibility provided by split mould technology, Chris Robinson emphasises that thermoforming does still have its limitations.

"We have seen new shapes like jars and pedestal pots, but it is important to recognise that the form-fill-seal machine is a combination of a number of packaging operations and its capabilities in producing containers may be more limited than a single purpose thermoformer or injection moulder."

### Improved flexibility

Multivac too has made headway in improving the flexibility of its equipment. The company recently built equipment to produce a 200mm square pack, with a forming plate that drops into the die, enabling the customer to produce a corner pack on the same machine.

"The changeover time is less than 10 minutes for a completely different looking pack," explains Jim Campbell.

Multivac can also produce equipment which will automatically switch between pack sizes. "With the thermoformers we're producing now we can alter the depth automatically in the die, so a salad producer could, for example, produce a 100g grab-and-go pack, a 250g twin pack and a 350g family pack on the same machine, simply by selecting a different programme."

Multivac has also taken thermoforming into new territory with the Form Shrink process – using shrinkable film for top and bottom webs – which is put forward as a more economic alternative to using shrink bags for wrapping meat, sausage, poultry, cheese and convenience products.

Cavities are formed in the base web in the usual way and the product is loaded from the top using loading grids that considerably reduce contamination of the flange. After the

## Form-fill-seal polypropylene pots are shrink sleeved on machine

The first form-fill-seal machine to produce microwave and freezer compatible pots and trays from polypropylene – complete with shrink-on decorative sleeves – was demonstrated by German manufacturer Hassia at Interpack last year. Ultra-clean or aseptic versions are available.

Aimed at products such as desserts, jam, baby food, pet food, soups and ready meals, the Polyflex 8/48 is said to provide all the conventional materials and logistics cost savings of the form-fill-seal approach but also the operational advantages of in-line decoration, via a totally integrated single machine that uses only reels of packaging materials.

At Interpack the machine was running a 250ml bowl, which is typical of desserts and baby food, as UK representative Engelmann & Buckham points out.

The machine is capable of speeds up to 25 cycles a minute, and can run a 480mm wide base web of either mono polypropylene or a high barrier co-extrusion such as pp/evoh/pp, creating a single row of pots up to 80mm diameter on each cycle. Maximum forming depth is 90mm.

To cope with the thermal instability of polypropylene – particularly its susceptibility

top web is sealed in place, the overlapping film is removed by product shaped cutters and a peel tag can be provided if required. The film is then shrunk. Pack strength apart, Multivac points out that a principal advantage of the system is the opportunity to create an individual pack design using clear or printed top and bottom webs.

Ultimately though, Multivac recognises that there are applications in which the use of pre-forms is always going to be preferable. The packing of chicken breast multipacks is one such example.

"The way those lines operate is that there is a grading line further downstream in the production hall, so chicken breasts come through in varying weights. Thermoforming wouldn't work particularly well because you'd have to

post-processing shrinkage compared with other thermoforming materials – the Polyflex employs a series of photo-electric sensors to monitor the position of the cavities at every station after forming and then, via the independent servo drives, keep them in register to the next station.

This means that the formed cavities are precisely located for the lidding, sleeving and cutting stages, independent of any web elongation or contraction as a result of machine stoppage, change of speed or ambient temperature.

Lidding material is typically peelable petp/pp while the printed sleeves are made from orientated polystyrene and applied to the



*Sleeved thermoform-fill-seal pots: Produced on the Hassia Polyflex*

underside of the containers by a reciprocating carriage that handles a whole row within the cycle. The sleeves are then shrunk on in an enclosed steam chamber and the containers move to the cutting station for separation.

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position the thermoformer above the grader, which wouldn't allow time for the packers to orientate and present the chicken. Ultimately, it's got to be the right packing system for the customer," says Jim Campbell. ■

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For full details of all PPMA members able to supply thermoform-fill-seal machinery, consult the PPMA machinery finder service, tel: 020 8773 8111, or visit [www.ppma.co.uk](http://www.ppma.co.uk)