

# Flexibility in latest fillers means Handling any sack

SOME OF THE LATEST **SACK FILLING MACHINES** ARE ABLE TO HANDLE VIRTUALLY ALL PRE-MADE TYPES, AS WELL AS USING FORM-FILL-SEAL TO LOWER THE COST OF PACKING IN PLASTIC.

**S**ack filling systems have joined the broadening array of packaging equipment which, today, is called on to provide greater flexibility by handling a broad range of sizes or pack styles on a single machine.

In machinery terms, it could be said that in essence there are only three types of sack to handle or produce: pre-made, form-fill-seal from tube or form-fill-seal from flat film. But the variety of closing systems for pre-made sacks, and the trade off between capital cost and speed within the form-fill-seal category, means that flexibility is being achieved in a number of different ways.

For example, pre-made sacks of different materials can be filled and closed in a variety of ways at

speeds up to 600 an hour by the new German built Weitek MFM (multi-functional machine) introduced by agent Aetna UK at last year's PPMA Show and since joined by a 1200-an-hour version.

The machine is expected to appeal in particular to contract packers or companies selling into a broad range of markets where different styles of sacks are required, allowing users to heat seal plastic bags and stitch paper or woven polypropylene or, where possible, employ both stitching and heat sealing methods. Weight range is 10-50kg.

Although the machine is completely automatic, room is also provided for a hand fed posi-

tion to be incorporated if required although, alternatively, the space can be used to fit a form-fill-seal bag-making station that operates from tubular film.

Trevor Mitford at Aetna UK explains the rationale: "Typically there are packers who supply a certain proportion of their output in plastic bags and the rest in paper sacks. Rice is a fair example. However reels of plastic tubing

made and filled at the same point. Speed is the issue, with flat film machinery usually unable to match the output of equipment that works with tubular film.

Dedicated equipment from the German manufacturer Weitek covers both form-fill-seal equipment using layflat tubing and fillers for pre-made sacks.

For example, the WFG machine will handle free-flowing materials at rates up to 25 bags a minute providing a pillow or gusseted bags, depending on the format of the film tube. In addition, the machine can be equipped to seal across the four corners of a bag, creating a neater, squarer pack as well as providing a bag that is easier to empty completely. This may be important to avoid wasting the contents or ensure that no toxic products remain.

The WFG machine is also available with a pre-made bag magazine for polyethylene sacks but only to provide speeds up to 300 or 400 an hour.

Then there is the WFM model to handle powdery free-flowing materials at speeds up to 20 bags a minute, while cleaning the bag mouth immediately before the seal is made. The machine is available to handle pre-made bags of most constructions: paper, woven polypropylene or polyethylene.

Dedicated pre-made bag fillers in the Weitek WFO range give speeds up to 20 bags a minute.

However, for higher throughput there is the Weitek WRF carousel filler, aimed in particular at products such as flour that require shaking down for de-aeration after filling. A continuous motion machine on which filling, de-aeration and sealing takes place on the move, the WRF has a weighing station that is fixed, but the



**Multi-function:** Weitek MFM 1200 can be equipped to handle most types of sack including ffs

offer a cost saving of around 15 per cent over pre-made plastic bags which justifies a form-fill-seal approach for that part of the output."

## Half the price

Since tubular ffs machines first make the bag – sealing the bottom in an area away from the product and then transferring the bag to the filling point – closing can be similar to pre-made plastic bags and there is no longitudinal seal to worry about. The bag mouth can be cleaned immediately before the seal is made.

However, flat film ffs machines can be half the price of tubular ffs to handle the same size bags – since the machinery is smaller and the bag is

## SACK FILLING

filling head rotates with the carousel allowing speeds up to 37 bags a minute to be achieved.

A further development from Weitek is in valve sack filling where the company has devised a net weight fluidising air packer system for 10-50kg bags. Instead of taring off the sack and then filling aerated product by weight, first via the main feed and then by dribble feed, the Weitek machine weighs the product in a separate chamber before any air is introduced.

### Fluidised for discharge

Only then is the product fluidised for discharge into the sack, which is assisted by the fact that the spout is vertical, rather than horizontal as in most air packers. The result, says the company, is higher speed, greater accuracy and cleaner filling to help avoid product contamination in the seal area.

Cleaner filling is also the aim of a vertical screw de-aeration system announced by Weitek. This uses an auger with a tapered pitch screw, which compresses and de-aerates the product as it is being fed into the bag.

The auger operates within a double wall stainless steel tube in which the inner wall is porous – to suit the particle size of the products – and negative pressure is applied within the annulus. The progressive pitch of the auger squeezes the product and air is extracted through the porous tube wall.

One of these systems has recently been installed for icing sugar, and another for food ingredients.

Meanwhile, the Concetti range of tubular ffs machines are now available in the UK through Golconda, the Continua 1800 being the latest model. This is able to create bags up to 50kg, particularly for the chemicals, building materials and agricultural industries and can be supplied made entirely of stainless steel, for applications involving aggressive or corrosive products or for particularly difficult environmental conditions.

There is a PLC machine management system which provides diagnostics and is also said to allow format changes to be made in 90 seconds.

The range of flat film ffs machines made in Italy by Esse Gi – now available on the UK market from Aetna UK – includes large scale systems able to provide form-fill-seal sacks of 5-50kg at speeds up to 20 a minute. Principal applications are for products such as peat, compost, sawdust, straw, industrial powders, and soap powder.

Because of the weights involved, these larger machines are generally hydraulically powered,

rather than by pneumatics, and are available with an articulated film lift to raise the reel, which may be up to 600mm diameter and 1300mm wide, from floor level into the unwind position.

The film feed is motorised and there is also a splicing station, as well as a film centring system with press-button controls at the front of the machine, allowing the operator to move the reel left or right while monitoring the film alignment from his normal working position.

A novel feature of the larger machines, such as the CTS-50 for bagging peat, topsoil, bark and similar materials, is a carousel for the forming tubes, which is of particular benefit for users who regularly need to make size changes.

Large format forming tubes are frequently too heavy to be lifted by a single operator, but the Esse Gi machines can be equipped with a carousel magazine holding four tubes, which are exchanged simply by removing a pin and turning the magazine until the new tube is in place.

A full range of options is available, including a dual film sealing facility for laminates or polyethylene films, automatic film centring, handle punch, block bottom format and gas flushing.

### Baling systems for blocks

Esse Gi has recently developed a range of baling systems for products that need to be compressed and packed into block form and has also supplied complete packaging systems for reducing wood into chips and then packing the chips through a compression baler, on through a palletiser and finally a pallet stretchwrap system.

Aetna UK says that waste disposal areas could be equipped with systems such as this to deal with larger items of garden waste, and the end product then sold back to the gardeners.

Installation of large format flat film ffs machinery to handle dry, water soluble polyacrylamides and flocculants for a variety of industrial uses has recently been completed by Cytec Industries at its plant in Bradford.

Two existing Sandiacre TG600L vertical baggers have been joined by a third machine to replace a 25kg pre-formed sack filling operation, running at three to four packs a minute, and pave the way for expansion.

The TG600L, by far the largest machine in Sandiacre's range, is equipped with a clutch-brake film transportation mechanism to give a maximum bag length up to 600mm on a single pull – with multi-pull as standard – and a pneumatic jaw closure system that can handle bag widths up to 600mm.



*Semi-automatic: Webb has recently supplied several EF-11 machines for food ingredients*

Speed is up to 30 sacks a minute and, in particular points out Sandiacre, ease of access to the bag length controls mean that changes due to fluctuations in bulk density are readily accommodated.

Turning to pre-made sacks, Euroweigh now has three models in its range to fill weights from 10 to 50kg. The Speedweigh 420 and 920 are the largest of these machines and consist of twin heavy duty vibratory feeders to transport product from the infeed hopper via pneumatically operated bulk and fine control gates into a weighpan, suspended from a loadcell.

Typical applications currently include products such as frozen vegetables and frozen fruit, pet foods, chemicals, tea and cereals. Construction is in stainless steel throughout.

The Weighmate 3 is a simpler sack filler for applications in which speed is not a priority. Product is taken from the infeed hopper via a vibratory feed tray and fed directly into the sack



**Simple solution:** Euroweigh Weighmate 3 for lower speed operations

food and bakery ingredients industry for dosing pre-made bags with 2-25kg of powder.

The machines incorporate a weigh-fill control system said to allow fast bulk filling, slowing down as it reaches target weight to optimise overall fill times and provide accurate weight control. A pneumatic gripping system holds the sack during the simultaneous filling and weighing operation while extraction points are included for dusty products.

### Part of an automated system

Machines can be supplied as standalone units or as part of an automated system in which all further elements – typically a bulk loading elevator and a conveyor mounted bag sealer or stitching machine – are automatically synchronised for minimum operator intervention. Cleandown and tool changeovers are made without tools and a full statistical reports package is included as standard.

Auger based powder and granule filling equipment manufacturer All-Fill International says its AFI Series 10 machine provides a versatile configuration for users who need to dose a diverse range of products and weights into a variety of containers. The machine has a combination weigh platform, which is floor-mounted to avoid interference and vibration from the filler, and allows filling into both flexible and rigid containers.

The system has a clamp to hold sacks in place during filling and a two-position foot-switch to actuate the clamp and to initiate the filling sequence. The full weight of the sack is supported by a roller conveyor, making it a simple task to transfer the sack onto an adjacent conveyor for stitching or sealing.

The machine is now offered with a full colour touch screen panel and memory for all variable parameters. Upgrades are available for two-speed/multi-stage filling for greater accuracy, active feedback software to minimise product give-away when filling to average weights legislation, a full statistics package, and an integrated printer.

Finally, Pacepacker has introduced what is said to be the fastest open mouth bag placer currently produced by a UK company. The G-Type placer handles 900 bags an hour, working with one or two overhead weighers, depending on the product.

The G-Type uses established features from the company's previous bag placers but has a new system for feeding bags into the opening cups. The tail of the sack is lifted to allow stainless



**Flexible arrangement:** All-Fill AFI Series 10 auger filler accommodates a diverse range of products



**Biggest bagger:** Sandiacre's TG600L vertical form-fill-seal machine handles bags up to 600mm wide

well as products such as chocolate and frozen or fresh foods.

Dual vibratory feed trays on the SBS Ultra allow a wide range of products to be handled at high speed and there is room for 100 pre-set programmes within the control system, to provide quick changeover. Applications include vertical form-fill-seal sack making machinery, but also other bulk containers such as cases and tubs.

The Titan is designed for pre-made sacks of any material, which are clamped directly to the outfeed chute as product is filled. Like the SBS Ultra, the machine uses dual feed trays to allow a wide range of products to be handled.

Webb Automation has recently supplied a number of its semi-automatic EF-11 powder and granule sack filling machines to users in the

or case, which is normally clamped to the weigh platform. For accuracy, a two speed system is employed to give a fast bulk feed and slower top-up to target weight.

The latest weigh-fillers from Easiweigh are the SBS Ultra and the Titan, both capable of dispensing weights up to 50kg for applications that include pet foods, fertiliser and seeds as



**Dual feed trays:** The Easiweigh Titan works with pre-made sacks of any material

steel track to run under it, separating it from the pile of bags. The track then carries the bag into the opening cups where physical stops ensure alignment of the open mouth of the bag between the cups.

Speed is obtained as a result of the tail of the next bag being picked up while the previous bag is opened, allowing the bag to feed directly into the opening cups as soon as the previous one is swung onto the clamp. The empty sack magazine is 2.5 metres long and can hold over 1000 empty sacks.

Recent turnkey installations have combined the machine with Pacepacker's closing line and its robotic palletiser for full automation. ■

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# Closing the open mouth sack

NEW WAYS OF CLOSING OPEN MOUTH BAGS HAVE ARRIVED OVER THE PAST FEW YEARS, DRIVEN BY THE NEEDS OF INDUSTRIAL CUSTOMERS FOR FASTER, BETTER, SAFER AND MORE EFFICIENT METHODS.

Open mouth bag closure is often regarded as an area of packaging that has been stuck in a time warp.

But, says Fischbein Saxon general manager Arthur Daniels, legislation, the need for traceability and the increased awareness of the need for total bag integrity have led closing machinery specialists to develop new ways.

However, he points out, there are many other factors now entering the bag closing equation, including automation, quick size change, reduced maintenance and identification of the contents (see table below).

"Once those matters have been satisfied, customers must ask themselves if both the mechanical performance and the aesthetic performance of both machinery and bag are of the standard they require," says Arthur Daniels.

"The mechanical aspect must feature a strong efficient closure that does not leak in transport and warehouse handling. The bag itself, in whatever material, should also be tough enough since a closure is only as good as the bag it closes. There is a growing and understandable demand for sift-resistant enclosures so that environmental contamination from the bag contents is avoided as well as ingress by insects and other contaminants."

The relatively recent trend towards double enclosure, guaranteeing a true sift-proof bag is,

he believes, further evidence of the drive towards total bag integrity.

Despite being one of the oldest forms of packaging, open mouth bags still remain the most flexible type of packaging for a huge variety of materials either in bulk form or in smaller, retail sizes. So what are the closing options?

#### Sewing

Closing an open mouth sack by sewing is still extremely popular since, apart from being the cheapest method available, the range of closures offers a number of options.

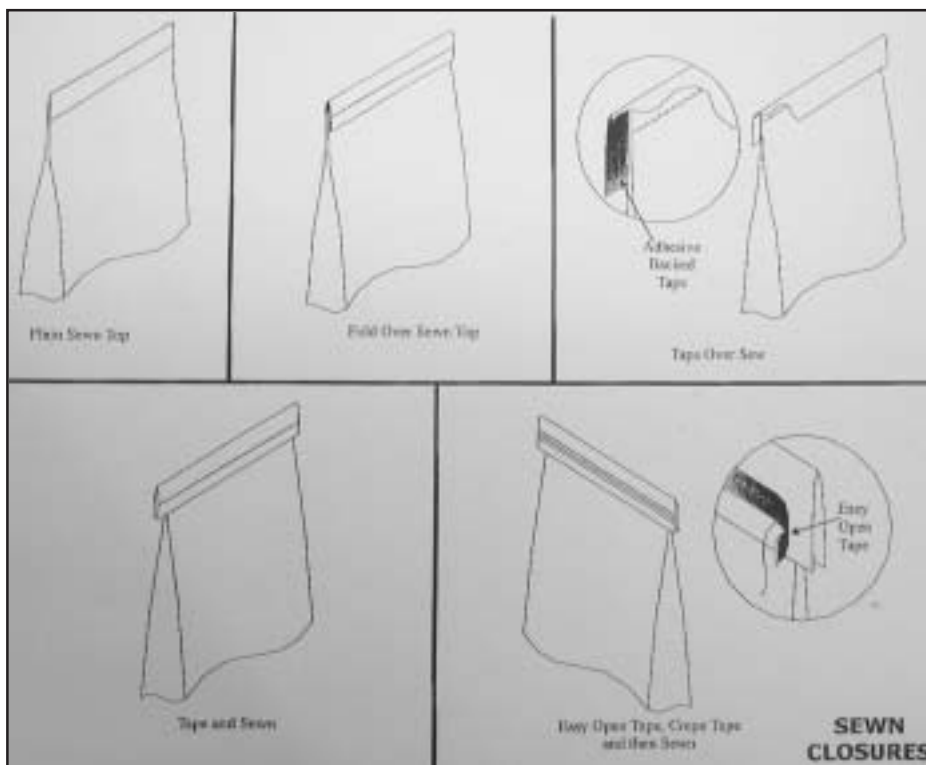
Closing with a plain single or double sewn thread is still widely employed but plain sewing with a fold-over to reduce leakage has also become popular. The addition of tape to help seal the needle holes has many applications and 'easy-open' sewn tape also sells well.

The latest innovation in this field is the tape-over sewing method using a 60mm wide pre-coated paper tape with either a heat activated hot-melt adhesive or a polyethylene coated tape, depending on the application. This gives a strong, clean, durable and sift-resistant closure.

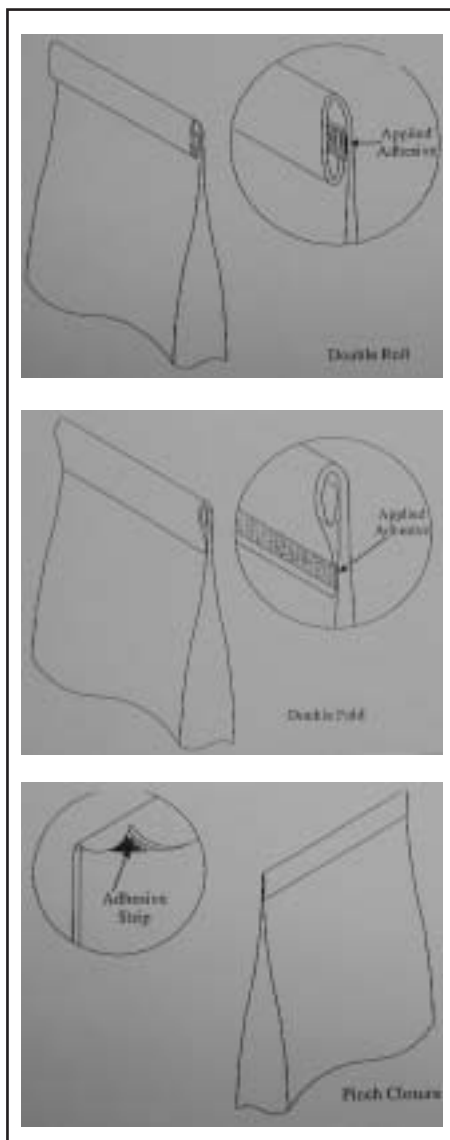
The key to high-speed bag closing with automatic sewing is, of course, the sewing head itself, with the latest equipment from Fischbein Saxon, for example, offering low vibration levels at speeds up to 2600rpm.

#### What users want in open mouth sack closing

- Reduced costs by automation throughout the production process up to and including bag closing and palletisation.
- Creation of a 24/7 production capability and downtime reduced to minimal amounts.
- Ability to change bag sizes quickly with minimal set up time.
- Secure, sift-proof closure of bags eliminating leakage, the risk of in-bound contamination and consequent product losses.
- Low maintenance by the operator and spare parts available fast when needed.
- Consumer-attractive closures that aid market positioning and corporate identity
- Clear identification of bagged product, production date and all data needed for the accurate control of both stock and invoice processing.



**Popular solution:** Various methods of sewing can be adopted for closing open mouth sacks



**Gluing methods:** These include double roll, double fold and pinch closure styles

“Research led us to redesign some of the parts, add sophisticated surface treatments to working surfaces and to create a new rotary knife design that cuts the thread as the needle finishes its job,” explains Arthur Daniels.

“The sewing speeds now possible will allow outputs up to 1600 bags an hour, which in most cases means that the line is limited by the filling speed rather than the closing speed.”

He adds that one of the most important elements in the reliability of the sewing head is that it is sealed in oil, which guarantees a long life free from ingress of the dust and dirt particles that cause premature wear.

### Heat sealing

Each heat sealing method has its own niche depending on the type of bag and application.

Hot air sealers have the advantage of virtually no moving parts in the heat transfer process. Air heated to a precise temperature is blown onto the bag surface, creating the correct temperature on both sides of the bag needed for the material to become molten and then welded by a synchronised crimping roller.

This method is extremely low on downtime and has the advantage of virtually instant availability at the beginning of a shift or bag change.

Band sealers use two Teflon-fibreglass sealing bands that are highly conductive and easily and quickly replaced in a production environment.

The seal width is 10mm and crimping rollers can augment the end sealing process. Machines are designed to seal bags and sacks of the thick-

est kind, made from materials such as polyolefin, PVC shrink films, polypropylene, co-extrusions and polyaminates.

Radiant sealers are useful in handling paper bags with a polyethylene coating on the inner liner. In this case the bags travel through a zone of precisely controlled radiated heat which creates the exact environment required to weld the inner liner without marking or affecting the outer paper bag.

All heat sealers offer sift-proof enclosure and have features such as a bag-top cleaner which blows fine materials away from the weld area prior to processing. Stainless steel versions to food quality standards can even be hosed down in particularly aggressive environments. Coding and marking facilities can also be fitted.

### Gluing

Some ingenious gluing methods have been created fairly recently for bag closing.

Multi-wall paper bags can be closed by a variety of methods. The double-roll closure is designed for small open-mouth bags of 5-15kg. After trimming the top, all plies are folded a first time and the hot-melt glue applied. All plies are then folded for a second operation and the bag top is compressed by passing it through coated belts, sealing the plies together.

The advantages of this system are flat ends for easy palletisation, square bottoms for uniform stacking and a contamination free product still within a traditional paper bag.

The double-fold closure for bags up to 25kg uses a method in which one external ply is separated before folding and glued separately.

In the pinch bag closure the glue is pre-applied during the production of the open top bag and reactivated during the closing process. Pinch bottom bags offer sift-proof integrity even for fine materials.

Combined closures are designed for complex multi-layer bags, some with a double closure for security and sift-proofing as well as aesthetic appearance.

Sewing and sealing is a system whereby a polyethylene liner within a paper bag will be completely sealed within a radiant sealer, followed by a sewing system usually reinforced with tape.

Heat sealing and gluing also employs a radiant sealer to close a poly-through-paper bag which is combined with a pinch bag closure for the total sift-proof reassurance now demanded by a growing number of users. ■

**More information - enter 118**