

# Pallet wrapping systems

# Stretch to fit

FEW PACKAGING PROCESSES OFFER SUCH A LIVING EVOLUTIONARY LADDER AS PALLET-WRAPPING MACHINERY, WRITES PAUL GANDER.

Most packaging processes have some differentiation between highly-automated top-end systems for high-volume users and semi-automatic alternatives. But few offer such a living evolutionary ladder as pallet stretch-wrapping.

With the highest speeds there are the 'ring' systems, capable of wrapping over 100 pallets an hour. Close behind comes the four-legged rotary arm system, able to wrap up to 70 pallets an hour, without a top sheet. Its cousin, the simpler – and slower – bridge rotary arm wrapper, is not designed for continuous operation, and will not usually manage more than 30 pallets an hour.

These types of system with their own through-conveyor are likely to be preferred if pallet stability, as well as output, is a major consideration. Lightweight and unstable loads are not likely to perform well on the type of system which rotates the pallet while wrapping.

Turntables or low-level systems come, appropriately enough, fairly low down in the stretch-wrapping evolutionary tree, but not quite at the bottom. In the UK especially, a large amount of pallet-wrapping is still carried out by hand – far more, it seems, than in the rest of Western Europe.

Barry Tucker, chairman of Aetna UK – which supplies the Robopac range of wrappers – is puzzled by this generalised reluctance to automate, or even semi-automate, the process. "Hand-wrap film is much more expensive than any other type of film," he says. "And it means that the pallet is not wrapped as well."

Even if cost and quality issues are not enough to convince those companies still using hand-wrapping of the need to change, Barry Tucker believes that, in the long run, health and safety questions will make it happen anyway. Manual handling and repetitive strain considerations cannot be ignored. "At some point, these companies are going to have to find some sort of



**Cantilever design:** Robopac Genesis ring-style wrapper with auto reel change

system to get people away from damaging their backs like this," he says.

For many end users automating for the first time, a turntable system is the entry-level option. Here, speeds tend to be lower than rotary arm wrappers, although Adpak Machinery Systems says its WM983 semi-automatic machine can wrap 20-30 pallets an hour. It has a maximum load of 2 tonnes and will accommodate pallets up to 2.1 metres high.

### Self-propelled wrapper

One alternative to turntable systems as a replacement for hand-wrapping is the battery-operated self-propelled, or robotic wrapper. Again, Aetna UK notes that at least ten times as many of these systems are sold in individual

Continental markets as in the UK - possibly precisely because they are seen as cost-effective alternatives to hand-wrapping.

Undeterred, Watershed Packaging has added a self-propelled wrapper to its range. Like other units of this type, the FP Easy can be moved around the factory as required. It runs off two rechargeable batteries, and offers four different wrapping programmes. It is also available with a power-pre-stretch option.

When it comes to assessing performance at the other, high-output end of the scale, at whatever stage in the line, discussions about machine speed are rarely as objective as they should be. And pallet wrapping speeds are no exception.

Indeed, as Andy Walker, project manager at



**Clean finish:** Mancon 2201 is equipped with infra-red sealing for the film tail



**Euro keypad:** Orion offers an alternative to knobs and dials on lower speed machines

MJ Maillis explains, quotations for higher speeds can more often than not be based on a minimum wrap quantity, with no double wrap at the top and bottom, and heavily reduced overlap.

Barry Tucker at Aetna UK agrees that speeds are often exaggerated. Nevertheless, he explains that the highest outputs achieved on Robopac machines are in niche applications or compact loads such as stacks of plastic drums. Here, he says, speeds of 120 pallets a minute are possible.

UK manufacturer Orion Packaging Systems took the rotary arm route on its automatic high-speed wrappers, and has never looked back. Says managing director Walter Williams: "I think the ring system has been hyped a lot. It is more complex than an arm and doesn't necessarily reach higher speeds."

Despite having the Genesis ring system as part of the Robopac pallet wrapping range, Barry Tucker at Aetna UK is also keen to place the rise of the ring-style machine in its historical context.

"When Haloila first came in with the ring in the early 1980s, it was quite revolutionary. It was well-sold by Mancon, who convinced the top 20 or 30 blue-chip companies in the UK that it was a big advance on the rotary arm machines of the time." These influential businesses gave a lead to the rest of industry by picking the ring-style pallet wrapper route.

Even so, says Mr Tucker, the original rotary arm wrappers, challenged by the first ring-style machines, were not particularly good systems. But when Robopac and others introduced improved rotary arm systems, they found that the top end of the market was already locked into ring technology. Understandably, Robopac and others then took the decision to develop their own ring systems.

But it was certainly not the case that the ring approach to pallet-wrapping was going to replace more conventional techniques. "Even companies which go for a ring system to meet their high-speed needs are quite happy to fall back on a rotary arm system for lower speeds," says Barry Tucker, citing Coca Cola as a case in point.

And he agrees with Walter Williams at Orion that rotary arm technology is simpler and highly reliable. He adds: "Ring systems can be very expensive to repair, if you do have to do that." But for operations needing the very highest output and continuous running, it seems this type of unit will remain highly attractive.

### More advanced features

In some cases, the more advanced stretch-wrapping features are only available on the top-of-the-range ring machines. For example, the latest version of the Mancon 2201 stretchwrapper, supplied by MJ Maillis, promises a clean finish to the pallet wrap. The company emphasises the infra-red seaming, whereby the loose 'tail' of stretch film is cut and welded securely to the other layers of film.

According to Andy Walker at MJ Maillis, this feature is only available with these Mancon automatic ring machines. He explains: "A lot of pallet handling goes on in automated warehouses. If a tail of film flaps about, it can trip a sensor and bring the whole system to a stop. In that situation, it's a distinct advantage to be able to cut and weld the film."

The Italian built Pieri AVR400 ring-style wrapper demonstrated at September's PPMA Show by UK agent Adpal was sold to a leading UK wallpaper manufacturer and is able to handle up to 90 pallet loads an hour, with automatic selection from 15 programmable wrapping formats.

For savings in film, the machine can be equipped with power pre-stretch to 300 per cent elongation or, alternatively can operate with 7 micron pre-stretched film. Full or half size pallets and dollies are handled and there is a cut and tuck system to secure the film tail.

Evolution in machinery has, of course, run in parallel with improvements to stretch-wrap films. Combinations of low gauge and high strength, and the amount of stretch available, have all influenced the way that stretch film is applied. Power pre-stretch has become particularly important.

On ring style wrappers this option to maximise the stretch in the film has traditionally

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been powered via a slip ring system. However, according to Aetna UK, in production environments where there is a lot of product dust in the air, particularly sugar, this can end up by coating the slip ring and preventing it from functioning properly. Barry Tucker claims that Robopac's patented pre-stretch system, driven by a dynamo, avoids this potential hazard.

According to Orion, power pre-stretch works better on a rotary arm system. "The way the ring goes round the pallet, you can't use as much pre-stretch or you are likely to crush the load," Walter Williams argues. While this risk means that a ring system will only get away with 150-200 per cent stretch, he says, a rotary arm pre-stretch system can achieve 200-250 per cent.

For its part, MJ Maillis maintains that its power pre-stretch rollers can result in a 300 per cent gain.

### Customised equipment

Orion's Automatic Rotary Arm (ARA) 400 and 500 machines can wrap up to 60 or 70 pallets an hour. The main reason for the company's success in pallet wrapping systems, says Walter Williams, is its ability to customise equipment, such as the Orion ARA wrappers supplied to Morris Furniture.

"The problem was that the previous supplier didn't assess the full wrapping specification," Mr Williams explains. Each load was wrapped, but not all the way down to the base tray on each item of furniture, so that trays frequently fell off. He adds: "We designed a lifting system to sneak the film under the tray, and ensure it stayed in place."

Meanwhile ITW Mima has announced the new Octopus Compact ring style pallet wrapper for handling unstable

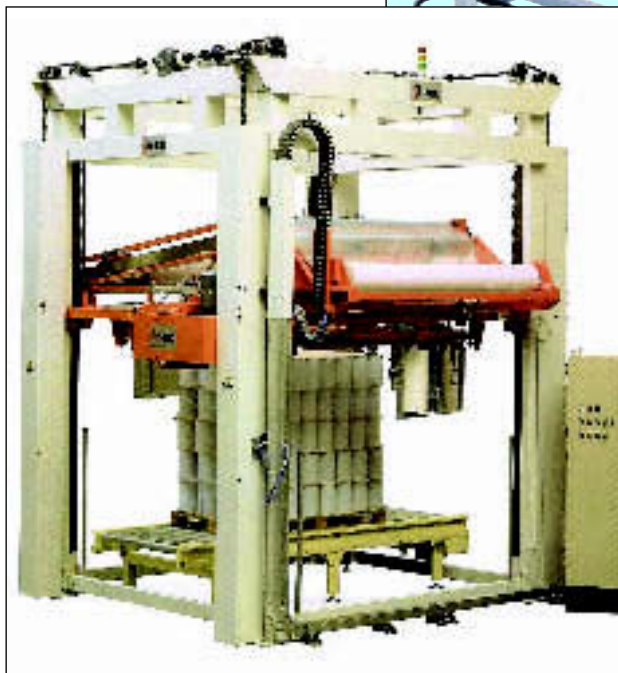
loads at speeds up to 35 pallets an hour. The machine sells for the same price as rotating arm and turntable machines and, by virtue of using a ring rather than an arm, is said to be much easier to maintain.

Three versions are available: semi-automatic with fork-truck pallet placement, roll-in-roll-out, and a fully automatic conveyor based system. The semi-automatic model can be upgraded to fully automatic in the field.

The machine is able to handle pallets up to 2.4 metres high and incorporates a tail-tucker system which inserts the tail of the film under the previous film layer at the end of the wrapping cycle. Power pre stretch is available, with a choice of 150, 220 and 260 per cent.

For many suppliers, the simplicity of the controls is an important consideration. Sontex has a range of three wrappers from Italdibipack, including the Ecospir ELC. This offers joystick control of the film carriage height, and is designed as an entry-level machine.

The Ecospir ELC-S is likewise a low-cost, semi-automatic machine, says Sontex, but this time with electronic controls to



vary the number of wraps at the top and base of the pallet. This machine has also been upgraded, with a variable-speed inverter now controlling the turntable, allowing operators to ramp up wrapping speeds and limit the amount of film laid onto the load.

While the ELC-S can handle pallet loads up to 1 tonne and 2 metres high, the Ecospir A-ID can manage oversize loads up to 1.8 tonnes, measuring up to 2.7 metres high.



**Above:** ITW Mima has introduced the Octopus Compact ring style machine for lower speeds.

**Left:** Pieri AVR400/TS rotating ring pallet wrapper from Adpal

introduced a "European keypad" for its semi-automatic low-profile machines, the LP 500 range.

### Self-explanatory operation

The European tag on this keypad derives from the fact that UK manufacturers almost invariably prefer the "knobs and dials" option, says Mr Williams. "This version is so self-explanatory that the customer can start the machine up for the first time without us being there," he adds.

But while the ELP 500, as the keypad version is called, has been earmarked primarily for export, Mr Williams concedes that there may be operations in the UK which would value this technology. Five pre-programmed settings allow operators to adapt wrapping sequences to a range of different types and sizes of load. Importantly, a key code can also be used to protect settings from tampering. Seven or eight customers have apparently already expressed interest in electronically lockable controls of this sort.

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In due course, says Orion, the new keypad will also be available on the semi-automatic rotary arm RA range. An RA 700 has been installed at poultry processor Bernard Matthews, in an appropriate design for a food environment, and with no moving parts in contact with the ground. As Mr Williams explains, while the RA 700 can match the LP range with speeds of around 35 pallets an hour, or 22 revolutions a minute, the rotary arm system means that it is "rock solid".

For Aetna UK, advances in control systems and software have been even more far-reaching. Says Barry Tucker: "Quite often now the palletiser controls the stretchwrapper - it tells it when to wrap, when not to wrap, and what type of wrap to apply."

And then there is additional automation - particularly for the high-output, continuous production environments - with stretchwrap film and top sheet reels being delivered to the Robopac Genesis while it is operating. As Aetna UK points out, with outputs topping 100 pallets an hour it is clearly important to avoid downtime while these reels are replaced.

More complex stretch-wrapping line configurations have been developed over recent years to cope with changing manufacturer and retailer needs.

### Wrapping pairs of dollies

For example, the growing use of dollies in retail distribution has led Aetna UK to design a high-speed system which twins two Robopac Genesis wrappers in sequence on a single line. This patented dovetailing of the two machines on one line means that two dollies can be wrapped simultaneously, and then combined immediately afterwards.

According to Aetna UK, the line offers a 75 per cent increase in capacity over a single machine, while also requiring less cost and space than a system which puts the two wrappers on separate lines.

The interface between the palletiser and the stretchwrapper is no longer always as straightforward as it used to be. Mr Tucker describes an installation at Premier Foods, where eight palletisers on separate lines feed a cross-conveyor. This in turn delivers completed pallets to a line which splits between two high-speed stretch-wrappers.

Pricing of pallet stretch-wrappers is as varied as the systems themselves. Aetna UK puts the installation cost of one of its high-speed machines at between £45,000 and £50,000.

Adpak puts a price tag of £2500 on its basic turntable system.

What seems certain is that, even at the top of the market, stretch-wrapping has both established its credentials as the optimum method for covering a pallet, and maintained a hefty price differential in comparison with other technologies.

### Conscious of energy costs

Barry Tucker points out that a hood system for pallets can cost up to £100,000. "It is expensive and involves a lot of equipment," he says.

As for shrink-wrapping, he argues that although installations still exist, the technology is definitely on the wane as a viable solution for pallet-wrapping. "You need very big heat tunnels for this, and people have become much more conscious of the amount of heat and energy they are wasting."

Even where manufacturers are concerned about protecting their product from the weather, and need a waterproof wrap on the pallet, an alternative to stretch-wrapping may still not be required. As Mr Tucker explains, by reversing the wrapping sequence and "tiling" the layers of film, the end user can still produce a water-resistant wrap.

He is convinced that production teams are now giving much more thought to this final stage of packaging operation. "Even ten years ago, most people didn't know what stretch-wrapper they had on the end of their line. No one attached much importance to it. It was seen as a straightforward exercise after palletising."

He continues: "Nowadays, it's becoming more and more sophisticated, and critical to the efficient running of the line as a whole." That is certainly the message that suppliers are attempting to get across to large-scale and small-scale users alike. ■

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