

# Falling size and cost paves way to One for each line

AS PALLETISERS COME DOWN IN SIZE AND COST, SO THE OPTION OF A SEPARATE MACHINE FOR EACH LINE HAS BECOME MORE ATTRACTIVE, WRITES MARTIN KEAY.

The most fundamental decision to be taken when choosing a palletiser is not what type of machine to use – high-level, low-level, gantry, robot – but whether to have dedicated machines, each serving a single production line, or a system that feeds production from several lines into one or a number of palletisers.

Several factors influence this decision including line speeds, factory layout, space at the end of production lines and of course cost. But this is not new.

What is new is that the balance between opting for a dedicated palletiser or a palletising system is now tipping firmly in favour of dedicated palletisers, compared with ten years ago when a palletising system was the more likely choice.

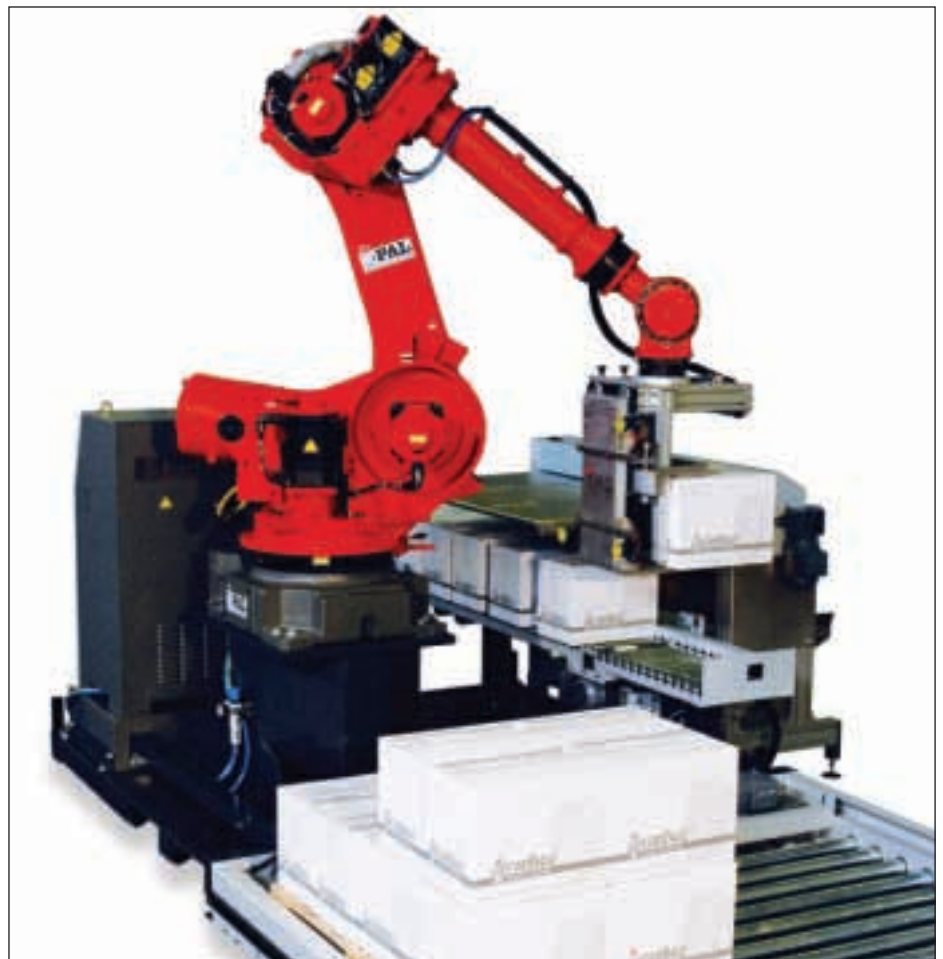
This change in buying habits is due to two main factors – the reducing cost of dedicated palletisers and the shrinking size of these machines, particularly the skid mounted variety which arrives in a freight container as a complete unit ready for use.

There is also an increasing recognition that a palletiser is not just a “nice to have” addition to a production line which gets justified when production output rises or manual lifting begins to look unsafe, but an essential piece of equipment for any production line which needs to be costed in at the start of a project.

Another factor in favour of the dedicated palletiser is the change in senior management thinking which now views a production line as a discrete asset that can be moved from factory to factory and from country to country as market demands change. Without a dedicated palletiser a production line is not complete.

## Compact robot palletisers

Typical of the latest generation of compact skid mounted palletisers is the i-Pal supplied by Orion Packaging Systems. This consists of a spherical robot which, together with pallet conveyors and a pick-point, is mounted on a steel



*Skid mounted: i-Pal robot arrives in a shipping container ready for work*

skid. On arrival, the unit can be simply rolled out of its shipping container and positioned at the end of the production line, ready for use.

Its universal gripper head allows it to palletise a wide range of products and it is also equipped with an automatic pallet changing system for uninterrupted operation.

The i-Pal is available on a rental basis and can work with cases, trays or other packs measuring from 200 x 150 x 80mm up to 600 x 400 x 400mm. Speed is 20 products a minute and it can be optionally equipped with a layer sheet dispenser.

A completely transportable robot palletising

cell that can be moved quickly from one line to another – so ensuring maximum utilisation – has been introduced by Engsol UK, which represents the German manufacturer ETT. The basic frame that supports the machinery is compact for transport, but readily extendable to the working position.

Palletising patterns are calculated automatically by the machine, which also incorporates layer sheet storage, and is available with a range of grippers to suit all products.

“This new development in palletising technology opens the doors to many companies who in the past could not justify a dedicated cell per

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production line," says Engsol managing director Geoff Yallop.

### GMP palletisers

The drivers for choosing dedicated palletisers in the pharmaceutical industry are different from those of other industries where the value of products and need for good hygiene and product containment are not so acute.

These factors have already resulted in the development of combined case-packers and palletisers, but the development by Pester of a GMP palletiser that can be located in a clean room is likely to be a significant development and the start of a new trend in palletiser design.

Five and six axis industrial robots are employed, sized to cope with heavy products such as those found in the personal care industry or to cope with the smaller packs more common in the pharmaceutical industry. High accuracy is claimed and speeds up to 15 cycles a minute are possible, using multiple picking tools.

Automatic pallet magazine loaders are available along with dual pallet stations for continuous operation and multiple product identification should a single palletiser be employed at the end of several lines. The robots can also be configured to apply and verify case labels, insert slip sheets and even change their own tooling to cope with different products.

IMA developed its Flex Palletiser as a compact, versatile machine capable of palletising with a four or six axis Fanuc robot while also being able to checkweigh incoming cases and identify them with ink jet codes or labels. The machine can also be equipped with a large capacity empty pallet magazine with automatic handling of empty and full pallets.

### Robots rule

Palletisers based on industrial robots are of course particularly suitable for use as dedicated palletisers.

For example, in addition to bag and box palletisers Abar Automation is now supplying robotic bucket and drum palletisers based on its A1200 robot. This four axis unit can be combined with a self adjusting pick-up hand to operate with different sizes and weights of container while product can be fed from single or multiple production lines.

Where capacities are low the robot can also be fitted with an attachment to allow empty pallets to be taken from a stack and placed onto the loading conveyor, so eliminating the cost of

pallet de-stacking equipment. Further attachments can also be provided for placement of slip or layer sheets.

The ZP1 palletiser from Italian manufacturer CAM, which occupies a footprint of just 2 x 2 metres, has been specifically designed to sit at the end of a packing line, and can be fitted with a gripper or suction head, and single or multi pick-off heads to handle shrinkwrapped collations or cases. Speed is up to 12 placements a minute, or more with the multi pick-off device.

The system has industrial PC based controls, which give memory for up to 1000 products, allowing size changeover within about 5 minutes, says UK representative Campak. Various options are available, including a three or ten empty pallet feeder magazine, and automatic layer pad application.

Recent installations include two lines for a major pharmaceutical manufacturer in Ireland, handling cases of both cartons and naked bottles which are also checked by the integral case checkweighers.

Samas, part of the Italian OPM Group, builds a complete range of robotic palletising systems, from a budget priced unit machine using a simple three axis robot, called the Compact, right up to fully automated, centralised systems incorporating multi-axis robots from companies such as Fanuc and Kuka, together with LGVs, labellers, and pallet wrappers.

In its most basic format the Compact machine has a footprint of just 3.50 x 2.27 metres, weighs 1.5 tonnes and can make up to eight picks a minute, with multiple tooling allowing the 60kg payload to be fully utilised if required. Slip sheets can also be handled and empty pallets retrieved from a magazine.

Although Samas makes its own column robot for multiple line applications, the company is increasingly integrating robots from other specialists, explains UK representative Hansel UK. Normally these larger multi-axis robots can provide up to ten picks a minute and handle payloads in excess of 500kg.

In the UK Samas has installed systems in a diverse range of applications including stacking plastic crates onto trolleys, palletising frozen blocks of meat, palletising cases of cereal bars and also display trays of after dinner mints.

### Gantry palletisers

With so many robot palletisers to choose from it is easy to overlook the value of the gantry or pick-and-place palletiser. Gantry machines are



**Pick-and-place:** CP-G Robot from Italian manufacturer Apsol can lift 40kg

very effective, low cost and compact dedicated palletisers and lend themselves to being added to even the most crowded production lines because, in contrast to a robot palletiser, the bulk of the mechanism is mounted above the pack conveyor and pallet position.

For example, the Palsys GRP-40 marketed in the UK by AMJ Maters is a compact, fully automatic gantry robotic palletiser with a pallet magazine and dispenser for 15 pallets and a low-level pallet conveyor to allow the full pallet to be removed by a pallet truck. Capacity is eight to nine cycles a minute with one or more packs placed on each.

One of the most recent to be installed in the UK has been designed so that a second gantry robot can be added to serve a future second production line. This means that as a single machine serving one line the GRP-40 occupies a footprint of 4060 x 3460mm and ultimately, as a twin palletiser for two lines, will occupy an area of 4060 x 4860mm.

A further example is the Euroimpianti Skilled 101, now available in the UK from Aetna UK. Said to be particularly easy to programme, it operates within a footprint of just 9sq metres, making it well suited to applications where floor space is at a premium. Its modular design also makes self-installation a



**GMP palletiser:** New machine from Pester is designed for operation in cleanrooms



**Transportable:** ETT palletiser can be moved on a compact frame that extends to the working position

practical consideration, says Aetna UK. Speed is 8-10 cases a minute with a 25kg capacity.

A zoned safety system based on light beams and photocells gives continuous operation by allowing a completed pallet to be withdrawn while, in an adjacent zone, the machine is starting to load the next pallet.

Then there is the CP-G Robot from the Italian manufacturer Apsol, represented in the UK by Integrapak.

This overhead gantry pick-and-place palletiser, with three independent axes powered by brushless motors, is said to have a particularly sturdy framework, allowing it to handle lifts up

to 40kg. Multiple grippers, which are able to handle different size items without changeparts, can be employed to pick up to four cases per cycle, giving speeds up to 1000 cases an hour. Layer patterns are changed by the operator by inserting data from the touch screen panel or using the integral self-teach system.

In its basic version the CP-G robot loads the pallet while it is on the ground, allowing the machine to work without being fastened to the floor, and so be moved from one production line to another. Optional equipment includes an automatic pallet transport system, layer sheet feeder and automatic pallet magazine.

### Sack palletisers

Sack palletising has always been a field where dedicated palletisers have been preferred over complex palletising systems not least because sacks have a tendency to change shape when they are conveyed for long distances.

Here, as in other areas of palletisation, there is an increasing use of industrial robots as the main palletising mechanism, but a new machine developed by Italian manufacturer Concetti – UK representative Golconda – is combining robot technology with traditional low level palletiser mechanisms.

On the Concetti PS-3A sack palletiser each layer is created on a twin stripper plate platform equipped with motorised pushers on all four sides. Each sack is picked and placed onto the stripper plates by a gripper tool that can rotate through 360deg and is driven along the x and y-axes by servo motors and a system of toothed belts.

Once the layer has been formed, the stripper plates open to deposit the layer on the pallet and then close and apply compression to the top of the stack to ensure a level base for subsequent layers. Speed is up to 100 bags an hour.

As on a standard low level palletiser the pallet remains on the conveyor while the stripper plate assembly rises to deposit each layer onto the pallet and once the full pallet has discharged, lowers to form the new pallet load.

Golconda says the PS-3A is ideal for products that are aerated or bags that are irregular or need to be overlapped. The result is said to be improved presentation and a more secure stack.

Dutch manufacturer Verbruggen has installed a number of sack palletisers in the UK market, among the most recent being a PM-HE 400 supplied to flour miller Heygates' Downham Market mill to handle a range of sacks in 16, 20, 25 and 32kg sizes.

The machine is a small, simple unit capable of a number of stacking patterns and incorporates a full stacking bin to support the bags on three sides as they are palletised to prevent them slipping out of place.

Elsewhere in the UK Verbruggen, represented by RJ Herbert Engineering, has supplied palletisers for applications including potatoes, coal, and pet food.

### Palletising systems

Despite the advantages of dedicated palletisers it is important not to lose sight of the benefits of palletising systems. The usual rationale for preferring a system rather than a series of dedi-

icated machines is cost. So for instance if the choice is between four dedicated palletisers and a single palletiser plus conveyor system it may well be that the lowest cost option is the system.

However price is not the only factor. Many packaging lines are fitted into very congested factories and there may not be enough space to put even the most compact dedicated machine at the end of each line and so the only option is to convey packs to a remotely located palletising system.

### The logistics issue

Logistics is another issue. With separate palletisers it is usually necessary to handle empty and completed pallets with separate fork lift truck movements at every palletiser. However, in a palletising system all of the machines can be supplied with empty pallets from a single magazine and the full pallets can be discharged onto a common conveyor, typically into a pallet wrapping or strapping machine.

For example, Adpal has recently supplied a major UK biscuit manufacturer with a fully automatic turnkey robotic palletising system consisting of two Newtec Palletisation Pal Vite 410i robots each handling three lines of different products.

The six pallet build positions are serviced by an automated pallet transfer car system to deliver up to three different types of wooden pallet to the robots.

Cases of biscuits are conveyed to the infeeds

of the two robots, with bar code scanning to verify and sort the respective products. Cases are then picked row by row for palletising and full pallets collected by the same twin position transfer system for transport to a fully automatic pallet stretch-wrapping machine also supplied by Adpal.

Another way of creating a systems approach is to take one or more robotic palletisers to the various lines on a transfer car.

This was the solution from Adpal for a major UK producer of wall coverings where a 'multi pallet' robotic palletising system is able to handle up to 16 different pallet loads at once.

The two MP35 robots move on transfer cars between several lines with empty pallets fed into the system by a twin transfer car. Layer sheets are picked by the robots themselves from magazines mounted at floor level.

Operating speed is typically up to 24 cases a minute, with varying sizes of case and a variety of layer patterns.

Industrial robots are the core of an increasing number of palletising systems, but it is worth remembering the advantages of high-level palletisers that are the basis of most high speed palletising systems.

The high-level palletiser has two main advantages: high output, because layers can be formed with the minimum of pack movements, and compact footprint because the layer forming operation takes place over the top of the pallet handling systems. ■

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