

More than just a bit of conveyor

Users are accepting that conveyors can be more than just a means of shifting goods. As a result, many conveyor companies are becoming very much more than hardware suppliers. Report by John Dunn.

Life gets no easier for the conveyor industry. Customers are demanding faster and faster solutions to increasingly complex handling problems, yet the products and materials that conveyor suppliers are being asked to shift are not getting any easier to handle.

Big name clients now expect even large systems to be designed, installed and commissioned from scratch within three or four months. Also, as competition forces manufacturers and retailers to resort to increasingly innovative packaging ideas to catch the consumer's eye, the conveyor supplier is being left holding the baby.

How do you pick up those floppy bags of lettuce leaves or convey shampoos that won't stand upright on a bathroom shelf, let alone on a moving conveyor belt?

Conveyor companies are also being asked to help their customers meet the challenge of the government's energy tax. The Climate Change Levy (CCL), which came into force in April, will push up industry's energy bills. The Food and Drink Federation, for example, has warned that the CCL will add 15 per cent to the cost of energy for a typical food production company.

Unfortunately, conveyor equipment as such is not included on the government's list of approved energy efficient equipment, leaving it largely ineligible for the benefits of the enhanced capital allowance scheme that accompanies the CCL. Although drives and motors are eligible, only those used for moving gases and liquids – pumps, fans and compressors – will count.

Nevertheless, a number of conveyor users,

anxious to reduce their overall energy bills, have started to specify the latest energy saving motors for their systems. And some systems have been installed that automatically switch off a conveyor line if it is idle for too long.

But there is good news. The conveyor industry is beginning to win the 'systems' argument. The bigger customers, at least, now accept that conveyors can be more than just a means of shifting goods from A to B.

Management information

And conveyor companies are becoming integrated process control systems suppliers, delivering not just hardware but also the software and management information systems (MIS) to ensure that production machinery, handling equipment and packaging machinery work in tune with each other.

“Ten years ago we were selling conveyor systems that just happened to have some controls in them. Today, we end up selling a process control system which has conveyors in it.”

This does mean, though, that customers are beginning to take a much closer look at the through-life costs of their investment in conveyors. How reliable will the system be? How easy will it be to clean and maintain? How much will it cost to fix if it goes down? The more savvy buyers now send their production and maintenance engineers along to meetings with conveyor suppliers early on in the tender stage to get answers to these questions.

There's more good news. Sophisticated com-

puter simulation is helping to revolutionise conveyor system design. A number of suppliers have invested heavily in simulation packages that can prove-out designs on screen. Simulation allows customers to see what they are getting and what their system will do before the first piece of metal is cut. Simulation also gives customers the opportunity to ask 'what if' questions, so that when the final spec is agreed and the system is eventually installed it should be 'right first time'.

But it is the changing nature of packaging that is providing the biggest challenge to conveyor suppliers at the moment. Despite a growing public concern about the environmental impact of packaging, and often a perception that goods are 'over-packed', sales of pre-packed food, for example, are on the increase. As consumers demand more convenience and

more 'lifestyle' driven foods, manufacturers are having to develop ever wider ranges of pre-packed fresh foods, prepared and ready to use.

And despite consumer concerns about wasteful packaging, manufacturers are turning to new packaging materials and novelty packs in order

to give their products a point of difference on increasingly crowded supermarket shelves.

Less secondary packaging

At the same time, supermarkets are responding to concerns over packaging by reducing the amount of secondary packaging they have to deal with. Gone are the piles of used cardboard boxes stacked up at checkouts. Food and goods are being delivered straight onto supermarket shelves in returnable transit packaging (RTP) or

the plastic trays that protect food in transit and also act as display racks.

Going, too, are the rows of empty wooden pallets and metal cages parked at the back of supermarkets waiting to be taken away. They are being replaced by returnable plastic dollies: the new, wheelable plastic alternative to the wooden pallet. The advantage of dollies is that they can accommodate many different types of standard European tray and can be rolled off delivery trucks into the aisles ready for goods to be stacked straight onto the shelves.

Awkward and delicate shapes

The result of this revolution in primary and secondary packaging is that conveyor suppliers are being asked to come up with solutions for handling increasingly awkward and delicate shapes. Leicestershire based Dunn Group, for example, reckons it is one of the first conveyor companies to develop a line for dealing with dollies.

In a recent job for Express Dairies, for example, its Ashby-de-la-Zouch site was asked to provide a solution for unloading Tetra Briks of milk from wooden pallets and re-palletising them on to dollies, and then shrink-wrapping the dollies ready to go straight into supermarket aisles.

The installation at Express Dairies' Credenon site consists of a pallet infeed conveyor where full Euro pallets are placed ready for depalletising. These are then conveyed to a gantry where each layer of Tetra Briks (12 cartons to a pack, 10 packs to a layer) is removed by vacuum from the pallet and placed onto two dollies side by side. Full dollies are conveyed to a transfer car where they are separated, shrink-wrapped and then conveyed out of the system ready for collection by fork truck. Empty pallets are routed to a pallet stacker where they are collected. The system runs 8 hours a day, 7 days a week, palletising a dolly every minute.

"We have had to develop a new conveyor system to handle dollies," says Dunn design engineer Tony Whyman. "We have now done two systems and reckon we know the pitfalls."

But it isn't just dollies that have been keeping Dunn's designers busy. The company is currently commissioning a packaging line for a customer that uses robots to put pre-packed bags of salad into RTPs.

"We are packing 100 bags a minute 24 hours a day using robots with vacuum heads," says Whyman. "There are four lines and the bags come down to the robots already oriented. It's the first automated line on this sort of scale."



Dolly loading: Express Dairies at Credenon is using this system from Dunn Group to transfer Tetra Briks

The challenge was to find grippers that could pull a vacuum quickly enough to match the speeds required and that could also deal with a mix of different types and sizes of bag. "So we had to design and make our own vacuum cups," he explains.

Environmentally friendly

Tony Whyman anticipates that supermarkets will increase their influence over the development of re-usable secondary packaging so that more and more goods will go straight from the supplier's delivery truck onto the shelves, with no waste packaging to dispose of.

Food companies are also responding to concerns about environmentally friendly packaging. National food distribution company Pauleys of Corby in Northamptonshire, for instance, has deliberately chosen the recyclable Eco-Boxes for despatching fresh food to restaurants and other food service clients. The boxes are made of 50 per cent organic recyclable material. Yet they prevent squashing and breakage and are waterproof and freezer proof.

When Pauleys introduced Eco-Boxes it called in Conveyor Systems Ltd (CSL) of Swadlincote, Derbyshire, to devise an order picking and packaging line that would handle them along-



Remote monitoring: Gramac Process-View

side more traditional cardboard boxes. The system now fills and despatches 3500 returnable Eco-Boxes every day, mainly between 6pm and 4am – and demand is growing.

However, it is the food companies and manufacturers of personal hygiene products who are spearheading changes in individual product packaging, says Steve Pinney, managing director of FlexLink Systems, the Milton Keynes based plastic chain link conveyor manufacturer.

"When I look around supermarkets there's



Eco-Box packing line: Conveyor Systems' installation for food distributor Pauleys, Corby



Pick and pack: CSL took just four weeks to install this 500 metre system for Universal Music Group

no question that the packaging of products is very different from what it was five years ago. The emphasis is on making goods attractive, with weird and wonderful shapes or special offers such as a box of tea bags with a mug attached to the side. It makes a lot of products quite difficult to transport. It's a challenge. And it helps if we are called in early on, but that doesn't happen too often."

There's also no question that customers are becoming much more demanding, says Steve

Pinney. "Conveyors are consistently one of the last things a company thinks about when it introduces a new product or process. And this is reflected in the response times they expect from their suppliers.

Increased up times

"They'll want a £500,000 system quoted for, designed and installed in 16 weeks or less. And they also want increased up times, lower maintenance, and cleaner, more hygienic systems."

But the biggest factor in any order is speed of response and delivery, he adds, which is why FlexLink has gone over to e-mail to send customers quotations, designs and simulations of proposed systems. The company has also embraced e-commerce, setting up its own website to allow customers around the world to buy spares and components over the Internet, 24 hours a day.

"We've been trialing it for about six months and up to 60 customers and agents now use it. Our biggest customer in Ireland, for instance, now buys all its conveyor components from us over the Internet," Mr Pinney explains.

Process control systems

At Gramac Group in Hoddesdon, Hertfordshire, managing director John Parkin explains that customers are increasingly turning to their conveyor suppliers for complete turnkey process control systems.

In the past, he says, conveyors were usually seen in isolation as low cost items of equipment just for linking machines together. Today, he points out, customers want their conveyor system to control the whole process line and provide a management information system (MIS).

"Ten years ago we were selling conveyor systems that just happened to have some controls in them. Today, we end up selling a process control system which has conveyors in it. The trend today is towards controlling the whole manufacturing line, not just the conveyors."

In a recent job, for example, the client had predicted a doubling of demand over the next three years and called in Gramac to carry out a major upgrade of its existing conveyor system. At the same time the client wanted Gramac to upgrade the control system, which was based on programmable logic controllers, to create a modern centralised Scada (Supervisory Control And Data Acquisition) system.

The aim was to be able to identify and locate faults; record and log system events; and give operating staff central control of the whole system via their desktop computers.

Asking the conveyor supplier to act as a one-stop-shop to supply a turnkey picking and packing system has also paid off for music company Universal Music Group. Its Milton Keynes CD, video, DVD, cassette and record distribution centre was able to get a complex £400,000 system installed and commissioned in just four weeks, two weeks ahead of schedule.

Supplied by Conveyor Systems (CSL) the system brings together over 500 metres of existing

and new conveyor lines to despatch 13,000 parcels a week and 80 million items a year. Universal provided CSL with the logistics plan of what it wanted to achieve and then left CSL to supply the conveyors, ancillary equipment, software and engineering expertise to meet the plan. As a result the system was installed well ahead of schedule.

Greater integration

Over the next few years, the amount of automation in production lines will increase and so the trend towards the greater integration of conveyor systems with process and manufacturing lines will gather pace. In a recent job for toffee and confectionery maker Thorntons, for example, Dunn Group was asked to design and install a complete turnkey conveyor system for packing chocolates that included an automated bagging line, automated carton erectors and a new gift wrapping machine.

The installation, at Thorntons' new £35m factory in Alfreton, Derbyshire, presents fully erect empty chocolate boxes to the packing stations where operators fill them with chocolates. The boxes are assembled on a slow moving conveyor where operators add various types of chocolates to the boxes from an intermediate store alongside the conveyor. The packing area also includes a bagging line with a capacity for 26,000 bags a day. The conveyor system has helped double throughput to 56 boxes a minute for some types of chocolate.

John Parkin at Gramac also believes that as the price of vision systems comes down, robots will be widely used for pick and place jobs on conveyor lines to replace manual operations, so increasing the level of control over the line. Gramac has also already integrated CCTV cameras into conveyor management information systems (MIS).

Using the Process-View system managers no longer need a separate TV monitor to see what is happening on the line. Process-View allows real-time CCTV pictures to be viewed directly from the computer on their desks and, when the MIS logs an alarm from the conveyor system, the relevant CCTV picture pops up on the computer screen.

Cost of maintenance

John Parkin has also noticed an increased interest by larger users in the cost of maintenance of conveyor systems. Conveyor systems can now last up to 15 years since modern modular designs mean that they no longer need to be



Turnkey packing line: Complete chocolate packing line installed by Dunn Group for Thorntons

scrapped or replaced when a product line finishes. They can be reconfigured and refurbished. Consequently, says Mr Parkin, customers are taking a greater interest in the versatility and through-life costs and the efficiency of their systems.

A typical example of how 'old' conveyors can be reconfigured and refurbished to give them a second life comes from FlexLink. It recently dismantled and rebuilt a system for crisp maker Snack Partners in Corby, Northamptonshire, in order to increase output of the teddy bear shaped Pom-Bar crisps.

Rebuilt with original parts

The original FlexLink plastic chain conveyor for handling Pom-Bar crisps was redesigned and rebuilt using the original parts to provide a multi-height handling system. "FlexLink designed and built two handling solutions from the same equipment for us," says John McDougall, engineer at Snack Partners. "It was up and running in a weekend and caused no disruption to our production."

The interest in maintenance costs has been given added urgency by the Climate Change Levy, says Gramac's John Parkin.

Gramac, for example, is currently installing a line for a well-known crisp manufacturer which

has insisted on using the latest high efficiency Siemens motors in order to reduce its energy bill. And in a project carried out for Halfords, Gramac installed conveyor drives that shut themselves off when there's no product coming down the line.

Compressed air is another major source of energy consumption in many factories. Putting in a complex conveyor line with pneumatic blade stops, right angle turners and vacuum palletisers can add significantly to the load on the compressed air system and the factory's overall energy bill, says Tony Whyman at the Dunn Group.

"We always estimate what the additional air consumption of the line is. And in one case where it was too high for the customer, we redesigned the vacuum cups to reduce it." ■

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Gramac Group	enter 136

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Bigger bottles: *Vasquali EK unscrambler*

SKERMAN PROMAC

Unscramblers suit larger containers

A new range of unscramblers from Italian manufacturer Vasquali can handle larger plastic bottles, from 200 to 1500ml at high speed.

Aligning systems in the EK series are manufactured in stainless steel throughout, while all container contact points are produced in a low friction plastic to minimise product damage.

The orientation unit uses a solid disc with machined sections contoured for the bottle shape. A second disc, which turns in the opposite direction, transfers the bottles into the contoured section. Orientated bottles are then gated into the exit funnels positioned under the discs, after which they are placed on the variable speed slat band conveyor, which also forms part of the EK unit.

If necessary, this conveyor can be fitted with a vacuum device, to improve bottle stability for unstable containers with difficult bases, or with turning units for handling containers with offset necks.

Agent Skerman Promac says size change takes no more than 30 minutes, or even less using a quick release system.

More information - enter I38

ULTRAPAC

Carton buffer will take 800 packs

A vertical carton buffer system is now available from Pester, the end-of-line equipment manufacturer represented in the UK by Ultracpac.

The system is a portable, independent unit with a capacity of up to 800 cartons, which can be returned to the line on a row by row basis,

providing 3-4 minutes buffer storage depending on carton dimensions.

According to Ultracpac the system takes just 5 minutes to change over from one size to another and provides space savings by eliminating large turntables.

More information - enter I39

F JAHN & Co

Flexible packs handled with care

Careful handling for retort pouches and aluminium containers is provided by custom systems from LAN Handling Systems, Holland, which take account of the special needs of flexible packaging.

As UK agent F Jahn & Co points out, non-rigid packs are increasingly being used in place of cans for products such as soups, sauces and petfoods, for a number of reasons.

These include a thinner profile that makes sterilisation faster and more uniform, and improved presentation, with a larger surface area for branding and labelling. But the risk of damage during production is higher, hence the need for special handling techniques, such as those from LAN Handling Systems.

A typical example of a retort pouch line sys-



Careful handling: *LAN retort tray loader*

tem from the company starts with the conveyors that bring the pouches from the filler to the tray loading station. As they arrive, a marshalling system will position the pouches accurately below a vacuum head which lifts a layer at a time onto a retort tray, using a vacuum-head pick-and-place system.

Each time a tray is filled, it will be stacked until a full stack can be transferred towards the shuttle car, which will automatically load the stacks into the batch retorts.

After sterilisation, the retorts are emptied by the shuttle, the stacks are transferred to the unloader, the trays are destacked and the pouches are unloaded from the tray, dried and conveyed to the packing area.

More information - enter I40

TRANSNORM SYSTEM

Zero pressure accumulation

Transnorm has introduced a zero pressure accumulation conveyor on which the drive or pressure rollers are assembled into groups or zones and mounted in a subframe connected to a pneumatic cylinder.

When the drive is disengaged, a brake is applied, so allowing accumulation to be achieved with gaps, yet avoiding any product 'coasting'.

Transnorm says that this product fills a gap in its range of roller accumulation conveyors, which consists of plain roller accumulation, including close pitch, eccentric roller accumulation and now zero pressure accumulation.

More information - enter I41

RUTLAND HANDLING

The case for a cantilever

Belt conveyors built by Rutland for the bakery, sandwich and confectionery industries are designed mostly on a cantilever basis to improve the speed and ease with which belts can be cleaned or replaced.

As Rutland points out, if the endless belt on a conventional 'leg at each corner' conveyor frame becomes worn or damaged, fails an HACCPs-type swab test, or the belt support mechanism malfunctions, removal becomes a major event.

After the belt has been cut, removed, and the



Easy belt change: *Rutland cantilever design*

problem solved it will need to be rejoined, generally by heat sealing, a specialist task entailing a site visit and extended downtime.

“The big bonus of the cantilever conveyor is

that endless belts can be totally removed intact, almost in seconds by in-house staff,” points out Rutland. “They are purchased pre-made, and installation costs are kept to a minimum because no specialist skill is required on site to install them.”

The cantilever conveyor incorporates a quick release cam that de-tensions the belt in one simple operation, and a pivoting section is usually built into the idle end, which further frees up the belt for easy removal.

Once the belt is removed, all internal mechanisms are exposed and easily accessible for maintenance or repair.

Rutland suggests that the cantilever design also opens up the option of having more than one belt per production line.

“Although there is an increased capital cost factor to be considered in multiple belt systems, it could be argued that the savings in high speed changeover, hygiene and maintenance more than compensate for the additional capital outlay,” says the company.

“Cantilever systems are ‘operator friendly’ in that they require neither specialist tools nor engineering expertise.”

Other benefits put forward include greater

flexibility in working methods, for example the time that can be saved on product changeover or cleaning. Either different belts can be designated for different products and deep cleaned when not in use, or two belts can alternate between being in production and in sanitation ready for the next changeover.

Further systems from Rutland Handling include sanitising conveyors to prevent contamination on outer packaging from entering controlled environments in industries such as food, pharmaceuticals and electronics.

These conveyors are said to be more reliable and cost-effective than traditional dip-tank or hand-spray methods, reducing manual handling and water consumption, while the 360deg spraying system uses only the exact amount of sanitising solution necessary.

Rutland also builds a clean-in-place system for automatically cleaning and then drying off belt conveyors employed in hygiene sensitive industries.

More information - enter I42

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BURGE EQUIPMENT

Caps air-conveyed up to 100 metres

Small parts, caps, lids and corks can be carried along standard pvc tubing for distances up to 100 metres and heights of 8 metres by the Palace Packaging Air-Veying system, now available from Burge Equipment. Speed is up to 1500 items a minute.

Bulk items are held in a 17-2800 litre capacity bin and fed into a blower by a cleated infeed belt which automatically adjusts via photo-cell sensor to give the correct speed and avoid jams. After travelling through the tubing, the components or closures are separated from the airflow by a cyclone dissipater.

The bin can be located in a storage area with overhead feed of parts to the production area, while one system can be used to feed a number of different lines.

Applications vary from metal closures in the bottling industry to corks in wine bottling. A dust collection system is available to remove debris from cork or cardboard.

More information - enter I43

PLANET FLOWLINE

Unscrambler for all shapes

A Fava Artemio bottle unscrambling system which uses an integral belt turning device to handle square, rectangular and oval containers, from 250ml to 1.4 litres, at speeds up to 4000 an hour, has recently been delivered by Planet Flowline.

Fava machines operate with two discs contra-rotating in the horizontal plane which, says Planet Flowline, increases efficiency and eliminates risk of jamming while providing speeds up to 13,000 containers an hour.

Machines are available to handle even very large items, such as 20 litre bulk containers. In a further recent contract, Planet Flowline supplied two mirror image machines, which accept the 20 litre containers with any side leading and delivers them with the filling spout leading.

Those containers that need orientating are sensed by a photcell and then turned 90deg in either direction, or 180deg as required, using a pincer device.

More information - enter I44



Stacks counted: *Doyen outfeed conveyor*

DOYEN MEDIPHARM

Shingle-stacks counted out

A servo driven flat belt shingling conveyor is now available from Doyen Medipharm to shingle-stack products in user selectable counts.

Mounted at the discharge of a packaging

machine, it counts a pre-defined number of products, advancing a small amount for each, to give a shingled stack of product that can be readily picked up by hand.

Spacing between each shingled product and each group of products can be easily selected by the operator using three controls: count, the number of products required in a stack; slow speed, the size of gap between each product in a stack; and high speed, the distance between one stack and the next.

More information - enter I45

LING SYSTEMS

Air conveyors improved

Improvements to the range of Ling air conveyors for handling empty PET bottles include a new neck guide material said to give a particularly low coefficient of friction, as well as high wear resistance and temperature stability.

Further advances include silenced fans and refinements to the company's combining-divert gate units, infeed-outfeed units and multi-lane palletiser infeeds. The electro-pneumatic con-

trols for these items are now batch produced by Ling's controls division, helping to reduce delivery times for entire conveying systems.

Control developments, using PLCs, include touch screen and 'teleservice' linking for customer support, as well as automatic modulation of fan speed and directional switching of pneumatic gates in response to line demands.

Ling points out that the advantages of transporting products by air rather than other forms of conveying are principally low maintenance, due to few moving parts, higher handling speeds, with the latest lines running at anything up to 1000bpm, and high catch up speeds, to fill gaps in supply.

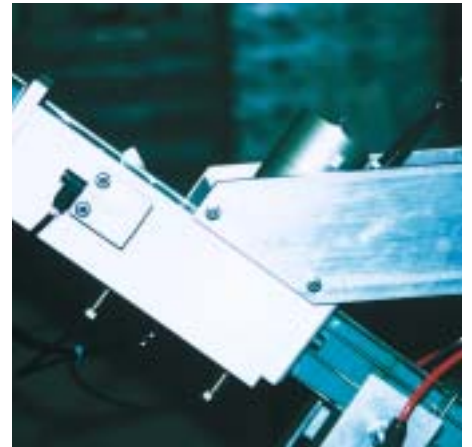
The latest PET bottle handling systems can link blowmoulders, unscramblers and depalletisers to rinsers/fillers and palletisers in any combination demanded by production, direct from the control panel, using a variety of divert 1:2, 1:3 and combining 2:1 gate units.

In addition, the links can be used as on-line buffer storage, providing accumulation between two machinery processes, which can also be enhanced with Ling's mechanical buffer storage units.

More information - enter I46

CAP CODER

Feeding flip-top containers



Flip-top orientation: *Automatic feeding of shampoo and similar flip-top capped containers can present an orientation problem when it is important to have all the flip-tops facing the same way. This unit fits on the cap-feed track of Cap Coder capping machinery, to sense the position of the flip-top closures and rotate any that are not in the correct orientation*

More information - enter I47