

# Speed and flexibility the aim in Machines to count on

SUPPLIERS OF COUNTING MACHINES, PARTICULARLY FOR PHARMACEUTICALS AND CONFECTIONERY, ARE SEEKING TO BALANCE THE OFTEN CONFLICTING DEMANDS OF FLEXIBILITY AND SPEED.

**H**istorically, manufacturers of pharmaceutical products such as solid dose tablets, capsules and gel caps, have faced two choices when buying counting equipment – slat counters or vibratory counters.

For large volumes and high speeds, the slat counter was generally considered the best bet. These use slats with channels shaped specifically to accommodate each tablet size on the run, and operate at speeds of up to 40,000 tablets a minute. But such high speeds come at the expense of flexibility; for every new product that is introduced, a different set of slats is required, which can make a slat system a costly option.

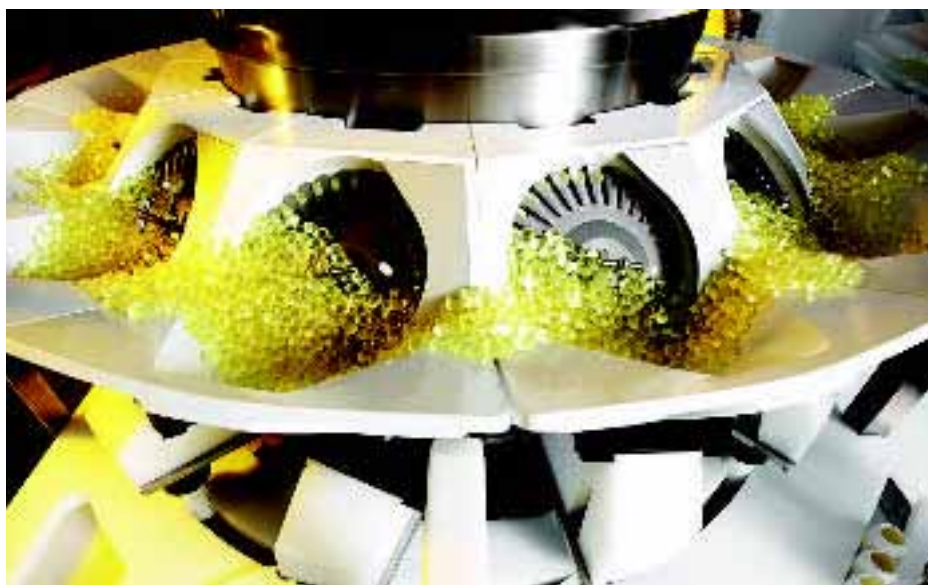
Those manufacturers looking for flexibility over speed would usually have opted for counting machines with vibratory feeders, which separate products by vibration and channel them in single file past an electronic scanner. These systems operate at much lower speeds of, say, 5000 tablets a minute, but require few or no change parts.

However, most pharmaceutical manufacturers today don't want to have to choose between flexibility and speed – they want both. Equipment suppliers have responded with machines that deliver on both counts.

For example, Brunel Healthcare, a UK-based manufacturer specialising in OTC licensed medicines and vitamin and mineral supplements, historically used traditional vibratory tablet counters. However, as demand for its products increased, it became apparent that simply installing an additional vibratory counting line was not an option.

Following discussions with QBL – its partner company for packaging services – and Romaco UK, Brunel bought a Bosspak RTC 200 tablet and capsule counting line.

Supplied by Romaco UK and installed at QBL's Burnley premises, the line includes unscrambling, counting, capping, re-torquing and labelling systems. The line has been installed 'through the wall', with both bottling and cap-



**Counting via disks:** A Bosspak Rotary RTC 200 machine is now used for Brunel Healthcare products

ping completed in a class 100,000 cleanroom.

Brunel's managing director, Ron Stagg, says: "Brunel's success and growth are based on the company's responsiveness to market requirements. Demand for our products has increased dramatically, to the point where we needed to increase throughput significantly. It was quickly concluded that Romaco's Bosspak technology was the only viable option, offering unrivalled output potential, together with state-of-the-art quality and security controls."

## Speed and flexibility

It is claimed that the Bosspak Rotary RTC combines speeds previously achieved only by slat counters with the flexibility and control of an electronic system. On difficult shaped products such as caplets and soft gel capsules, the RTC has been shown to exceed significantly the speeds normally associated with vibratory machines.

Tablets or capsules are collected from the hopper by rotating disks with pockets around their rims to carry individual products to the point of delivery. Products are released into the

bottle neck in a single stream and counted by a 'Quad Count' optical sensor matrix, also capable of detecting damaged items. Single stream delivery minimises the risk of clogging. The touchscreen user interface permits entry of parameters such as disk speed, dark time, count setting, gating delay and storage of recipes.

Netherlands-based Cremer, meanwhile, manufactures multi-channel counting machines which use vibratory plates to separate products which then fall freely through the detector channels. Counted products are cascaded down through several 'memory flap' units after which the correct quantity is discharged into a bucket elevator or packaging machine. Cremer says the fast 'memory flaps' enable its counting machines to operate non-stop so that maximum output is guaranteed.

Schwarz Pharma in the USA recently opted for two of Cremer's Double Tablet Counters when it was looking to replace its old counters with systems that could increase productivity while accommodating over 70 different tablets and capsules, ranging from 6 to 18mm in size.

Within a space-saving 12ft footprint, the

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Cremer Double Tablet Counter has two counting heads and a two-lane conveyor that fills up to 110 bottles a minute.

"When it was time to replace our old tablet counters, we began looking for new technology that would achieve our high line speeds and produce accurate results," explains James Cognata, project engineer at Schwarz Pharma.

"We are confident that Cremer has the best tablet counters. You can have the dustiest product and these things will not miss a count. Since we installed the Cremer systems, we have been operating with zero per cent defect on count."

As Schwarz is frequently changing between different products and container sizes, flexible filling and quick changeovers are critical. Up to 300 product recipes can be pre-programmed, enabling product-specific machine and control parameters to be downloaded for fast and simple set-up and changeover.

"The Cremer Double is very easy to take apart to clean. With a spare set of product contact parts, we are able to change over the tablet counters in less than 20 minutes," says James Cognata.

### New version of counter

For the last two years Cremer has been working on a new version of its CF tablet counter which will be ready for launch in May. The new model works on the same free-fall scanning and counting principles, but promises to deliver a number of new features and benefits.

It is modular in construction and features a new memory flap control system as well as a new container transport system. "It becomes not just a question of how fast the machine can count, but how fast it can handle containers, because if you have 300 containers a minute coming in, you've got to be able to handle them," explains Roger Wayte, sales engineer with Cremer.

He says the machine will be capable of outputs up to 400 containers a minute.

Cremer is not the only supplier to be unveiling a new high speed tablet counter this year; Italian manufacturer IMA UK has just intro-



**Twin machine:** Cremer CF1220 with two counting heads and a twin lane conveyor



**Single tablet rejection:** IMA Conta series electronic tablet counter

duced the Conta series of high speed electronic tablet counters, which it says can achieve speeds of 30,000 tablets a minute, which equates to 300 bottles a minute at 100 count.

The Conta series is said to be the only tablet counter on the market to feature single tablet reject – eliminating full bottle rejects and the associated rework. IMA's patent pending camera vision system screens tablets and capsules for shape, colour and integrity.

Indeed, as the technology gap closes between the various systems on the market, ancillary functions are increasingly being pushed as a differentiating factor by counting equipment suppliers. Many counting machines today profess not only to count quickly and accurately, but to also act as a quality control tool, by screening the product flow for broken or damaged items.

IMA Swiftpack, for example, has developed an electrostatic sensing system for its electronic multi-channel counters, which it claims can detect half-filled, broken or double tablets and capsules.

The system, which is incorporated into IMA



**Count and checkweigh:** Collischan TC8210 checkweigher hosting a Minicount tablet counter

Swiftpack's SV2 Intellisense counter, uses an electrostatic field to provide accurate assessment of tablet parameters such as size, shape and weight. Tablets are measured against the pre-set parameters as they fall through and disturb the field, with any tablets that do not conform rejected automatically.

### Range of quality checks

IMA Swiftpack says this inspection technology can offer a range of quality checks compared with infra-red technology, which can only check a product's shape. It can identify empty or partially filled capsules, and while infra-red systems can only recognise half tablets, the SV2 can detect even the slightest tablet imperfection.

However, in stretching the versatility of counters, is there a danger that you end up with a machine that is a 'jack of all trades, but master of none'?

# Heavy duty counting

It's not just high speed pharmaceutical and confectionery lines that deploy counting systems. Bulkier items, such as plumbing, heating, hardware and automotive parts, also have to be counted.

At the last PPMA Show Automated Packaging Systems introduced an automatic counting system called the AccuCount 200 which is capable of counting these and other items at speeds up to 2500 packs an hour.

Orientation funnels channel the product down from a bulk to a single flow to give enhanced control of the parts as they fall through the electronic detection eye for counting and batching.

Once the detection eye reaches the desired number of parts, an overcount discharge diverting funnel is activated, which redirects parts into an isolated bin.

The AccuCount 200 also operates a part profiling analysis, which assigns a value to each part. Any part below this value in weight or size, such as dirt, or broken parts, is identified as scrap and discounted.

Automated Packaging Systems says cus-



**Counter-bagger:** AccuCount 200 mounted on an Autobag bag-on-reel bagging machine

tomers who have replaced a manual operation with an AccuCount 200 have seen a five fold increase in productivity.

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Cremer has made a conscious decision not to go down the inspection route, preferring instead to focus on improving the accuracy and flexibility of its machines, as it questions whether wholly accurate inspection and high speed counting can be carried out simultaneously.

Roger Wayte predicts that future developments will focus on integrating the counting and the weighing functions more closely.

## Validation process

"More and more manufacturers want to be able to validate what has been counted. To date the only methods of verifying this are by manually counting product – which is completely impractical – and by weighing the container, which slows the system down as it can only be done statically, not dynamically."

There is evidence that manufacturers of counting equipment are making some headway in this area.

Logic TPS has designed a new tare and gross checkweighing system for use with both new and existing electronic tablet and capsule counters. Called the TC8210, the system will pre-weigh and zero a bottle weight before filling and then check the final weight of the count after filling.

Keith Gooch, managing director of Logic

TPS, describes it as a double-tier system. "Electronic tablet counting was brought in as a flexible solution, but it's not always the most accurate, so we're offering a system which counts and weighs at the same time. It's a double check for the filler in case of a funnel blockage or a malfunction on the machine," he explains.

"Particularly on electronic machines, if an air valve malfunctions, it could give an undercount or an overcount. There's no way of checking this after the tablets have been counted other than an operator checking each individual container."

The bottle is controlled in a star wheel and features a positive accept reject system to ensure that any bottles with undercount are rejected. "This assumes the products are all wrong until it knows it's got the right count and weight," explains Mr Gooch.

Logic TPS distributes a range of electronic counting machines which are designed and built by Collischan in Germany. There are three counters in the range: the single track Minicount, the dual track Minicount Twin and the Multicount 12 track, twin funnel machine. They achieve respective outputs of up to 1500, 3000 and 8000 tablets a minute.

Meanwhile, Hachmang, represented in the UK

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by Engelmann & Buckham, is about to deliver a line which includes nine counting systems to a German confectionery customer. The system also includes a bucket elevator with two discharge points, two vertical baggers, two weighing scales and a separate after-dosing system.

By using the counting systems in combination with checkweighing before product is packed, underweights can be detected and rectified rather than be rejected, resulting in less waste and greater efficiency.

First of all, eight counting machines count a mix of products to 99.99 per cent accuracy. The bucket elevator then collects each product in the programmed quantity and transports the mix to one of two discharge points above the vertical baggers. Beneath the exit of each discharge point is a timing hopper with two exits. Under each exit a weigh scale is positioned to check the weight of the counted, mixed product, before it is bagged.

If the mix is underweight by 5g or more, an individual product will be deposited in the scale, delivered from the ninth counting machine, overcoming the cost of recycling a rejected underweight manually. Once the average weight of the product mix is accurate, the mix is

deposited in the vertical bagger.

In comparison to a multihead weigher, this system offers the advantage that both the weight and quantity of product can be guaranteed – with a multihead weigher only the total weight can be guaranteed.

Finally, Easiweigh has announced the Easi-count high speed linear counter with an intelligent optical eye system said to give particularly accurate results. Operating speeds up to 60 packs a minute and an option of up to 12 lanes are available, depending on requirements. The differing lane configuration allows it to handle a wide range of products including frozen and fresh produce.

In summary, a machine which can satisfy the polar demands of faster speeds and greater flexibility is still the holy grail of pharmaceutical and confectionery counting. But unless the operating principles of counting machines undergo a sea-change, any future improvements in this area are likely to be incremental rather than revolutionary.

At the same time, ancillary features such as tablet inspection are becoming more important, as is the ability to integrate the weighing and counting operations. ■

### For further information

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