

Latest EU Directive brings M for metrology

UNLIKE OTHER CE MARKING DIRECTIVES, THE NEWLY APPROVED MEASURING INSTRUMENTS DIRECTIVE WILL NOT APPLY TO ALL CHECKWEIGHERS, AND WILL NOT APPLY IN ALL COUNTRIES FOR ALL INSTRUMENTS. MARTIN KEAY EXPLAINS.

Checkweighers are one of the instruments covered by the latest product from the Brussels Directive mill, the Measuring Instruments Directive (MID), which was finally approved on 31 March this year after more than 12 years of discussion.

In theory, because this is a free movement of goods, CE marking Directive, it should be possible to say that once this Directive comes into force on 30 October 2006, all checkweighers will have to comply with the Directive's numerous essential accuracy requirements.

However, unlike the other CE marking Directives, the MID will not apply to all checkweighers and will not apply in all countries for all instruments.

This is because the Directive only applies to instruments that are being used for a legal metrology purpose, which in English means they are being used to determine a price or to determine a fine. So for instance a checkweigher that is used to control the weight of dough pieces in a bakery is not being used for a legal metrology purpose and so will not have to comply with the MID.

However a checkweigher that is being used to check and record the weight of finished packs of biscuits is performing a legal metrology function and so in principle would be subject to the MID.

But unlike any other CE marking Directive, the MID allows each country in the EU to decide if they want to regulate instruments for a particular set of tasks. So we can expect that France, Germany and the Netherlands, for example, will generally require checkweighers to comply to the MID, while the UK will not be insisting on compliance for checkweighers, but will require compliance for some other instruments covered by the Directive, such as electricity meters, petrol pumps and taxi meters.

On the face of it this could be a recipe for con-

fusion because there will be CE marked checkweighers that are quite legal to use in the UK, but illegal to use for the same purpose in Germany or France.

However complete confusion will be avoided because checkweighers that comply with the MID will have a supplementary M or metrology mark.

Affecting the price

But hang on – this is supposed to be an article about checkweighers, not about EU Directives. So what we really want to know is, will the MID affect the design or price of checkweighers?

Well as you might expect, manufacturers who have been taking a close interest in the development of the MID have known for some time what the requirements were likely to be and so have been getting their MID compliant models ready.

However, sadly for the early birds, they will not be allowed to claim conformity to the MID until 30 October 2006.

For example, new checkweighing machines announced recently include the SV series from Japanese manufacturer Anritsu, just launched on a Europe-wide basis in three model ranges.

The SVh machines offer high speed – up to 600 a minute – and accuracy to 10mg for pharmaceutical applications while the SVi machines are built to IP66 standard for wash-down in the food industry. The SVf checkweighers are for packed food products and industrial applications. Touch colour screen control and display is available as an option on all machines.

UK representative Selo-Bollans says that Anritsu has focussed on simplicity of operation and minimal maintenance. The optional 10.4in colour touch screen display can be customised so that commonly used functions can be easily accessed by operators but parameter changes



Launched in Europe: Anritsu SV checkweighing machines come in three model ranges

are reached through password levels for authorised personnel.

One of the functions available allows a pre-programmed mean weight to be achieved through automatic adjustment for European Average Weight compliance while statistical information can be displayed, saved to disk or output to the printer for future reference.

Three checkweighers

Also recently introduced is the Yamato G Series of three checkweighers, each fitted with a colour touch screen control system and capable of weighing almost any product from 10g to 6000g at speeds up to 330 a minute. The accuracy of up to 0.2g can also be applied to detecting a missing item from a pack, such as one biscuit from a pack of five.

The Yamato checkweighers can also communicate all statistical data in a variety of ways, which makes it easier for the user to interrogate.

Options available include feedback control,

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typically to an auger filling system to adjust dosage in accordance with the pre set limits and values of the checkweigher; and random checker, which allows the checkweigher set-up to be changed randomly from the input of bar code readers.

There is also remote monitoring by PC— which allows users to display and operate the touch screen display or one or more checkweighers – as well as the data acquisition suite, capable of processing data from up to 20 checkweighers and sending all weight data to a remote PC.

Water resistant for washdown

The Checkpoint M/VA announced by Avery Weigh-Tronix is a water resistant, dynamic checkweigher for washdown in high-risk food environments and has an adjustable operating height to allow simple retrofitting into existing lines. It features a wipe clean, stainless steel construction and IP65-rated conveyor motors, while the control board is housed in a water-proof cabinet.

The conveyor belt system is also built in stainless steel, with a quick-release mechanism for easy cleaning and fast reassembly.

Speed is up to 230 packs a minute to an accuracy of 0.2g and a full record of production statistics can be downloaded to the optional integrated printer or to a PC running PlantPower average weight software. Memory is provided for details of up to 80 different products.

Mettler Toledo has launched a new combined checkweigher and metal detector designed specifically for the food industry. Built in stainless steel, features include fully interlocked covers from the metal detector to the end of the outfeed conveyor and either twin bins or roller track for rejected products.

The machine can also be supplied as a simple checkweigher and has standard options including statistics to comply with average weights legislation, Ethernet connection and remote access.

But the big question for checkweigher manufacturers is this: does the MID allow them to simply make one design of checkweigher for all European markets or will they have to make two – one for countries that insist on compliance to the MID and one for countries, such as Britain, that will not be regulating checkweighers?

MID compliant checkweighers will inevitably be more expensive than non-compliant instruments and so UK customers will have to decide if the greater accuracy and assurance of third

party accuracy verification are worth the extra money.

And this begs the fairly fundamental question: is accuracy the main criteria when selecting a checkweigher? For some applications accuracy is clearly the main reason for selecting one particular design of machine, but in the vast majority of applications – provided the accuracy of the checkweigher is adequate to satisfy average weight legislation – other factors, which have nothing to do with legal metrology, become more important.

Speed of operation is often a crucial factor in checkweigher selection but under normal circumstances greater speed will almost inevitably mean lower accuracy. However Delford's new Multi-Lane checkweigher allows high speed to be achieved with no need to sacrifice accuracy.

Based on the Delford Guardian 2200 checkweigher, the Multi-Lane can accommodate up to eight lanes, allowing products from multi-lane filling and wrapping systems to be kept in lane rather than channelled into single file for checkweighing and then diverted back to multi-lane for packing.

Speeds in excess of 100 items a minute per lane can be achieved and each lane can also run on independent weight bands, allowing different products to be checkweighed simultaneously. Average weight and minimum weight programmes are standard with accuracy of $\pm 0.5g$ claimed, according to pack configuration.

The Guardian 2200 on which the Multi-Lane is based is built from stainless steel with food quality belts throughout and, says Delford, is designed to exceed the requirements of IP66, allowing high pressure hosedown for efficient cleaning. Speed is over 180 packs a minute. The Guardian 1000 machine is a general purpose checkweigher offering speeds up to 120 packs a minute.

Wireless Ethernet connection

Delford Checkweighers can also be equipped for wireless Ethernet to communicate to an access point that can be plugged into an existing local area network or directly into a PC, which transfer information to a receiver within the production area.

Purchasing a checkweigher that can cope with lots of different products is also an important criterion. Most checkweighers have the ability to store settings for several different products, but Cintex claims to be the first company to offer the facility to store different dynamic adjustment settings for different products.



Washdown: Avery Weigh-Tronix Checkpoint M/VA

The new intelligent digital filtering (IDF) approach developed by the company for its Eclipse 4000 range of checkweighers is said to improve accuracy by up to five times as a result of allowing the machine to collect weight data at over 1000 samples a second, even when the pack has started to leave the platform.

Extra weighings help filtering

This means that, often, 100 or more “good” extra weighings can be obtained before the IDF system decides the pack is too unstable for weighing. The overall increase in weighing time then allows a higher degree of filtering to take place and hence greater accuracy.

The software takes into account the fact that different products require different levels of filtering due to mechanical noise. So, unlike other systems that have just one filter setting for all products, Eclipse 4000 checkweighers regard each product individually and their optimum settings can be saved to menus for recall at any time.

But this brings us back to the Measuring Instruments Directive, because while in Britain customers are permitted to alter the dynamic setting of their checkweighers themselves, this is not allowed in Germany and the Netherlands. Current interpretations of the MID suggest that for checkweighers to comply with the MID they will need to be provided either with no dynamic setting, a lead sealed dynamic setting or with a password protected adjustment, so that only the manufacturer can alter the setting.

But now we have got on to the subject of password protection of software we may as



Multi-lane: Delford machine can be built with up to eight lanes to combine high speed and accuracy



Lifting to weigh: Checkweigh UK's Pakweigh has a "toast rack" to raise cases off a roller conveyor

well consider the influence of the American FDA's protocol for software in the pharmaceutical industry, 21 CFR 11.

In simple terms 21 CFR 11 requires software that can affect the quality of a pharmaceutical product to be password protected at various levels and with the facility to record an audit trail of who altered what and when.

Checkweigher manufacturers who are supplying instruments to the pharmaceutical industry have had to rewrite their software to comply with 21 CFR 11 and they will be relieved to know that the MID's requirements for protection of software that affects the weighting performance of a checkweigher will also have to be

secured or password protected in very similar ways to the FDA's 21 CFR 11 requirements.

For example, Thermo Electron Corporation has launched the Ramsey 21 CFR 11 enabled AC9 Rx checkweigher together with a retrofit software package for upgrading existing AC9 Rx models to give password and unique user IDs that are legally equivalent to an individual hand-written signature.

Three access levels

User IDs for the AC9 Rx are allocated and controlled by the system administrator and there are three access levels: operator, service and administrator. These can be set and controlled with the checkweigher switching automatically to protected mode when no user is logged-on or no keyboard input is detected for a pre-determined time.

For maximum security, the user selects AC9 Rx passwords to which the system administrator has no access. Password validity is defined in days and can be set between seven and 60 days with a 30-day default.

If a password is not renewed in time, the user is permanently disconnected and will only be re-admitted by an administrator. Users can change passwords at any time. The AC9 Rx control screen indicates current user and access levels.

All AC9 Rx stored records have an electronic signal identifying who was responsible for its generation. Comprehensive audit trail records include IDs, new and old variables and event details such as alarm re-sets, statistics clearing, product and calibration changes, tare zeroing

and enabling or disabling system options.

Audit trail records are stored in files, each holding up to 10,000 records (1.2Mb), on a hard drive. Audit trails, which can be exported to floppy disks, can be inspected on screen but cannot be altered.

Designing checkweighers so that they can be easily cleaned and used in a high care environment has been a focus of attention of checkweigher manufacturers for some years.

For example three AS Combo integrated checkweigher and metal detectors and a data management package have been supplied by Loma Systems to St Merryn Meats, helping to cut breakdowns significantly and increase speeds by 60 per cent on three new mince processing lines.

"Since Loma's all-in-one systems check 90 packs a minute, we have recorded a huge improvement in line speed compared to the old checkweighers, which could only manage 55 packs a minute," says technical manager Richard Clatworthy.

As well as speed, the new machines have also proved reliable and have significantly slashed the number of breakdowns at the Cornish plant. "The whole system has given us a real push forward in terms of processability and quality of product," says Mr Clatworthy. "An important part of this has been the reliability we get from Loma's equipment."

Lock Inspection Systems has recently delivered two further CK1500 dough weighers to Warburtons for its Glasgow and Wakefield sites.

"Using Lock doughweighers in our other UK plants yielded significant cost savings and so, when it came to purchasing machines for our Wakefield and Glasgow sites, we were confident that Lock could guarantee the same accurate and reliable weighing systems," says Warburtons' chief engineer John Smith

Installed after the dough rounder and before the first prover, Lock's CK1500 gives feedback servo control to the divider and provides Warburtons with reliable protection against producing under or overweight product.

It can weigh pieces of up to 900g and achieve throughput rates of 9000 pieces an hour. Accuracy for the most common applications is $\pm 1g$. In addition, the machine's auto-tare facility makes sure that any build-up of dough on the belt has no effect on final weight data.

Checkweighing is often just as much about finding missing product as establishing a correct product weight.

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For example, greetings card producer Hallmark has installed two Tesab TS9000 checkweighers on lines that produce packs of up to 24 cards and envelopes for the company's biggest customer, Marks & Spencer. Supplier Crusader Europe says the machines are able to detect if one envelope is missing or there is one item too many in a pack.

According to Checkweigh UK, part of Sparc Systems, the design of its new TS300 Pakweigh enables it to be one of the most accurate checkweighers available with an accuracy of ± 0.05 per cent.

"Not only will our customers be able to measure, for example, such things as whether a box contains 20 cartons, they will also be able to tell electronically whether there is an instruction sheet in each box," says Alan Ross, commercial director at Checkweigh UK.

This level of precision is achieved by dispensing with the usual continuous conveyor belt system and utilising what is called a "toast rack" of support fingers that rise between the rollers of a roller conveyor to lift cases for weighing. This enables the cases to be stationary when weighed, so providing high accuracy.

Checkweigh UK points out that this approach also avoids the usual need to cut into existing

conveyor systems and allows the machine to be readily transferred from one line to another. Random weight cases up to 50kg can be handled, with speed depending on pack size.

Controlled by touch screen technology, it has simple, menu-driven set-up and operation with 500 product codes available. The unit also has comprehensive management information capabilities and is Ethernet compatible and web enabled to support remote status checks via a standard browser. ■

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