

# How to Boost Checkweighing Efficiency

*Dirk Bettels, Senior Product Manager, Mettler-Toledo Garvens*

On agricultural production lines, as elsewhere in life, the smallest expenses can soon add up into something insurmountable. Even seemingly trivial errors in portion sizes on filling lines can result in costly levels of product waste, making the installation of advanced checkweighing systems crucial to keep this waste to a minimum and maximise manufacturing output.

Dirk Bettels, Senior Product Manager at global checkweighing manufacturer, Mettler-Toledo Garvens, answers our questions about how to ensure optimum efficiency.

## **What do we need to consider at the specification stage?**

Before making a purchasing decision, it is crucial that you think about the environment the checkweigher will be operating in. Humidity, high temperatures, draughts, excessive vibration and airborne dust can all negatively impact on weighing precision, while moisture and dust can prematurely age the system by damaging the conveyor belt or weigh cell. Selecting checkweighing technology with sealed casings, milled from a single piece of plastic or metal, and sloped surfaces for ease of cleaning for example, can help overcome these issues by preventing the ingress of particles or moisture and protecting the delicate mechanisms within.

You also need to consider whether there will be excessive movement or vibration near the checkweigher. Even tiny vibrations can be detected by sensitive checkweighing systems, which can distort measurements. Training staff about these potential correlations and other simple precautions can prevent these problems, ensuring precision weighing.

## **How does the type of product impact the choice of checkweigher?**

When selecting the correct checkweighing technology, it is important to consider the nature of the product to be inspected. In addition, packaging format, height, weight, whether the product is solid, powdered or liquid, for example, will affect pack stability in transit, potentially impacting on weighing accuracy. The installation of timing belts, screws or wheels can help to ensure each pack is correctly spaced so that only one at a time passes over the weigh cell. Side grips and transfer units act to keep each pack stable, optimising weighing accuracy and guaranteeing rejection of the correct pack in the event of an inspection failure.

The product and its packaging will also determine the type of reject device that should be used to remove the pack from the production line. Small, sealed packs can be rejected by a simple air jet device, whereas open containers may require a sweep-off rejecter.

The nature of the product will also affect the choice of conveyor mechanism. Granulate foods, such as salt, flour or sugar, overtime without precise cleaning, can cause corrosion damage to the conveyor system thereby producing friction to the moving parts. Selecting a checkweigher with a conveyor specifically designed to accommodate powdered products, featuring wide belts with minimal openings where grains could enter the machinery, will reduce the need for maintenance and ensure optimum weighing accuracy.

## **What role does the checkweigher set up play and how can we ensure the system is set up properly?**

Ensuring the checkweigher is set up correctly is critical to the success of the entire purchase. Proper calibration of your checkweigher to remove packs, that fall significantly above and below your product's target weight, not only ensures you meet metrology regulation requirements, but also reduces wasteful product giveaway. In order to guarantee that the average weight of your product batch is within legal limits, your target weight should be slightly above that stated on your packaging label. Precision checkweighers will enable you to set tighter tolerances above and below your product's target weight, allowing you to further reduce giveaway and minimise the risk of underweight products reaching consumers.

You should also make sure your checkweigher has been fitted in accordance with the weights and measures legislation governing your target markets. For example, in the case of compliance with the European Union's (EU) Measuring Instruments Directive (MID), your equipment supplier must engage an independent metrology certification body to assess whether the machine conforms to weight regulations and tolerances. The original test products must be available onsite indefinitely for future testing and verification, the responsibility of which rests with you, the manufacturer.

In addition, innovative data monitoring software should also be sourced to incorporate the checkweigher with the rest of the line's product inspection equipment. This will enable you to identify consistent product over- or underfill and locate the source of the error. What is more, it can also alert your filling machines earlier in the production line to any adverse filling trends, allowing them to adjust portions to rectify the issue and reduce the future incidence of costly product giveaway.

## **How important is operative training?**

A properly set up checkweigher with trained staff will help you to avoid weighing errors due to improper set up or even from physical damage. Every machine operative should receive basic training on the system software as well as appropriate care and maintenance of the machine and conveyor. An understanding of correct product set up and changeover procedures should be communicated to every operative, as well as that for false rejections or unexpected machine stoppages.

Many checkweigher manufacturers offer support for agricultural manufacturers to enable them to optimise checkweighing accuracy on their lines. Mettler-Toledo, for example, provides extensive training for machine operatives through its Product Inspection Training Course, helping them understand the capabilities of their checkweighing and other product inspection technologies and how to operate them effectively.

## **Would you recommend setting up a monitoring protocol?**

Yes – periodic monitoring of the checkweighing system can ensure that any issues that could affect weighing sensitivity and line efficiency are identified and rectified as quickly as possible. As part of your training regime, line operatives must be educated to pay attention to the system's output so that any differences in weighing accuracy are spotted early. A regular vision inspection routine should also be put in place as part of this procedure. This will identify any problems and enable you to put the corrective action into effect as quickly as possible.

Establishing a regular performance testing programme can help to guarantee accurate weighing. Atmospheric changes can affect weighing accuracy, so it is vital that the weigh cell's sensitivity be

regularly checked. This will safeguard against false rejects and help prevent overweight products from continuing on the production line.

Standardised procedures in the event of a weighing error should be implemented as well. Operatives should know what to do and be able to respond quickly, to minimise disruption to the production process.

### **What advice can you give regarding maintenance?**

If a component on your checkweigher begins to wear over time, early detection and rectification is paramount to boosting the uptime of your production line as a whole. It is vital that you undertake preventative action to replace worn components, such as conveyor belts, before they cause a malfunction. Much of this can be carried out by your operatives.

Alternatively, you can take advantage of your supplier's service technicians to ensure that maintenance is carried out correctly and that all components in need of work are identified. Some checkweigher suppliers offer a remote maintenance service, using secure cloud computing to continuously monitor system performance. This service can pinpoint potential causes for concern that may not be visible or obvious to operatives on site and in many cases correct them remotely, further reducing maintenance downtime for you.

In addition to maintenance, you should implement regular testing procedures of your checkweighing system to monitor performance. This includes scheduled service intervals with the technology supplier's technicians testing the precision of your system's weigh cells. Between these service intervals, you can also "self-test" by passing a packaged product of an established weight several times through the checkweigher to monitor the system's performance. Today's checkweighers feature easy-to-use Human Machine Interfaces (HMIs) to facilitate quick, straightforward recalibration of the weigh cells and rejection criteria, enabling you to correct many problems yourself.

To demonstrate due diligence and compliance with legal metrology regulations, you should ensure that all testing and maintenance records are comprehensively logged as proof of good practice.

### **What other advice can you give?**

Ensuring the product is the correct weight is not just about complying with legislation, but safeguarding product quality as well. The reputation of your brand depends on the correct checkweigher specification for your production line, and on the maintenance and monitoring procedures you set in place after it is installed.

As such, before making a purchasing decision, it is crucial to seek guidance from checkweighing experts. They will be able to offer support on system selection and set up, as well as training and maintenance. This advice will ensure your production line benefits from minimised downtime due to unscheduled repairs and reduced costly product giveaway, maximising efficiency and profits, allowing your brand to grow.

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### **About Dirk Bettels, Senior Product Manager**

Dirk Bettels has been working for Mettler-Toledo for over twenty years. In that time, he has been responsible for the company's electronic developments and, for the past seven years, has held the position of Senior Product Manager for checkweighing and checkweighing combination machines, such as metal detection, x-ray, marking, vision and labelling devices.

Due to his extensive experience in industrial automation, he is one of the driving forces behind Mettler-Toledo's innovations. He introduced the first x-ray checkweighing combination machine to the market, as well as the inaugural serialisation stand-alone machines. More recently, he developed the XS2MV TE, 4 in 1 serialisation station, with marking, camera inspection, tamper evident sealing and checkweighing on a footprint of below 2m.

### **About Mettler-Toledo**

Mettler-Toledo Garvens is the world's leading supplier of checkweighing solutions for the food and pharmaceutical industries. Together with Safeline, CI-Vision and Pharmacontrol Electronic GmbH (PCE), Mettler-Toledo Garvens forms the Product Inspection Division of Mettler-Toledo.

Mettler-Toledo develops, produces and sells precision instruments worldwide. The company is one of the largest suppliers of weighing systems in the world, whose high-quality products are used in laboratories as well as industrial and pharmaceutical retailing applications. Renowned producers of all conceivable everyday products rely on Mettler-Toledo's weighing technology as an important aid to product development. These producers reap the benefits of the global company's innovative products and global presence.

Mettler-Toledo's corporate philosophy centres around quality and tailored solutions. The company forms a true partnership with its customers, working together to develop unique solutions, providing support during the selection of appropriate systems and offering a reliable service.

For general information on Mettler-Toledo Product Inspection, visit: <http://www.mt.com/pi>.