

# The lifecycle of a checkweigher – six golden rules to increase efficiency

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**B**enjamin Franklin once said, 'Beware of little expenses: a small leak will sink a great ship'. The same can be said of food production lines. Small errors in portion quantities on filling lines can lead to unacceptable waste due to avoidable giveaway. To combat this, checkweighing systems can be used on production lines to inspect the weight and fill level of products to minimise wasteful overfill. Checkweighers are precision multifunction devices designed to offer the most sensitive weighing of products at high speeds. Like all line equipment, however, incorrect set up and maintenance procedures for checkweighers can lead to costly production downtime or even require replacement too early in their lifetime. Just a little care when selecting and setting up the system will enable you to use them at optimum efficiency with minimum maintenance, maximising manufacturing output and productivity.

Here are six golden rules that you can follow to optimise your checkweighing systems.

## Rule 1

### ● Consider the checkweigher's operating environment.

Prior to purchasing your checkweighing system, you should carefully consider the environment in which it will be operating and the nature of your product. Factors such as humidity, temperature fluctuations, draughts, excessive vibration and airborne dust can adversely affect weighing precision.

Harsh operating conditions with excessive moisture and dust in the atmosphere can limit the lifetime of your machine by entering and damaging conveyor belt and weigh cell mechanisms.

To circumvent the effects of humid or moist operating environments, you should look for checkweighing technology with sealed casings, milled from a single piece of plastic or metal, for example. This can prevent ingress of dust and moisture, protecting the delicate weigh cells within and the motors driving the conveyor system from damage and premature ageing.

Remember to alert your staff to the importance of ensuring that no unnecessary movement or vibration occurs in the vicinity of the checkweigher, caused, for example, by an employee rushing by.

Even small vibrations or air movements can be detected by sensitive checkweighing machinery, distorting measurements. Simple precautions

like these can prevent problems with precision or damage later on.

## Rule 2

### ● Fit the right checkweigher to the line.

There is no one-size-fits-all checkweighing solution. Each production line is different and the specific needs of your facility will determine the required specifications of the checkweigher. Before making a purchase decision, it is important that you carefully evaluate the features and specifications of the checkweigher to ensure it is the correct model for your production line.

Consider the weight and nature of the product being inspected, its packaging and the location of the checkweigher on the production line before committing to such an investment. Your product will determine whether the conveyor system requires extra features to ensure the pack is correctly orientated, properly spaced and stable before reaching the checkweigher. Packaging format, height, weight, whether the product is solid, powdered or liquid and the stability of the pack all have an effect 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, or side grips and transfer units to keep each pack stable.

This will optimise weighing accuracy and guarantee rejection of the correct pack in the event of an inspection failure. For example, a bottle of soft drink, because of its high centre of mass, will wobble slightly as it travels on the conveyor, affecting the accuracy of the checkweigher's measuring.

Simple side grips on the approach to the weigh cell can eliminate this wobble, ensuring the bottle is as still as possible for weighing.

The product 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.

Granulate foods, such as table salt, flour or sugar, can cause damage to the conveyor system both by corrosion and by the ingress of salt grains into the conveyor mechanism. This can cause undue friction and damage to the moving parts and will lead to the need for early replacement of the conveyor.

If this is the case for your production line, it is important to select a checkweigher with a conveyor developed for powdered products, with wide belts with minimal openings where grains can enter the machinery. This will reduce the need for maintenance and ensure optimum weighing accuracy by the weigh cells. The checkweigher must also be able to offer the highest weighing precision at the speeds required by the production line. This will prevent any reduction in your manufacturing output and efficiency and will minimise the need for extra timing conveyors as well.

## Rule 3

### ● Set up the checkweigher correctly.

While selecting the ideal checkweigher for your application is a great start, making sure it is properly set up is critical. Correct 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, it also allows you to reduce wasteful product giveaway.

Your target weight should be slightly above that stated on your packaging label as this will guarantee that the average weight of your product batch will fall within legal limits.

Precision checkweighers should allow you to set tighter tolerances above and below your product's target weight, enabling you to further reduce giveaway and minimise the risk of underweight products continuing on the production line. You should source innovative data monitoring software from your technology supplier to integrate your checkweigher with the rest of the line's product inspection equipment. This will enable you to identify consistently over- or underweight packs and to check for any other errors that may have occurred from a single location.

What is more, it can also alert your filling machines earlier in the production line to any adverse fill level trends, allowing them to adjust portions to correct the problem. Such pre-emptive condition monitoring can reduce the incidence of product rejects and costly product giveaway.

Before you can begin using the checkweigher, you must make sure that it has been installed according to any metrology regulations in force in the markets where you wish to trade. For example, you must confirm that your system has documentation to confirm it complies with the Measuring Instruments Directive (MID) if you wish to do business in the European Union (EU) or the member states of the European Free Trade Association (EFTA): Liechtenstein, Iceland, Norway and Switzerland.

Under the rules of this directive, your equipment supplier must engage an independent metrology certification body to undertake a MID Conformity Assessment of its checkweigher to confirm that the machine conforms to MID weight regulations and tolerances.

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The original test products must be available on site indefinitely for future testing and verification, the responsibility of which rests with you, the manufacturer.

#### Rule 4

##### ● Properly train the operatives.

A properly set up checkweigher with untrained staff will not benefit your line. Be sure to arrange for a comprehensive training programme for all of your machine operatives and do not allow untrained users to use the technology.

This 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.

#### Rule 5

##### ● Monitor the checkweigher periodically.

Key to early identification and rectification of any issues that could affect weighing sensitivity and production line efficiency is periodic monitoring of the checkweighing system. As part of your training regime, you should ensure line operatives 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. Don't forget to establish a regular performance testing programme from the very beginning to guarantee accurate weighing.

Atmospheric changes can affect weighing accuracy, so it is vital that the weigh cells' 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. Operatives should know what to do and be able to respond quickly to minimise disruption to the production process.

#### Rule 6

##### ● Keep a regular maintenance programme.

If a component on your checkweigher begins to wear over time, detecting and rectifying the issue early has a positive effect on the up time 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 maintenance are identified.

Some checkweigher suppliers offer a remote maintenance service, using modern and 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 should include 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.

Modern 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.

## Quality in the balance

A correctly filled and measured product is key to ensuring compliance with legislation and securing brand reputation. The quality of your product and your brand, as well as the profitability of your line, are therefore dependent on high performance checkweighing technology and maintenance procedures according to the needs of your production line. Following the six golden rules here can protect the checkweighing system and line from costly downtime due to unscheduled repairs and minimise wasteful product giveaway, maximising efficiency and profits, enabling your brand to grow. ■