High speed hazelnut waffle weighing

640 pieces per minute, officially calibrated!

OCS Checkweighers GmbH
Adam-Hoffmann-Str. 26 | 67657 Kaiserslautern | Germany
T +49.631.34146-0 | F +49.631.34146-8690
info.ww@ocs-cw.com | www.ocs-cw.com

OCS
CHECKWEIGHERS
A Wipotec Brand

Precise measurements despite oscillations and vibrations

High speed hazelnut waffle weighing: 640 pieces per minute, officially calibrated!

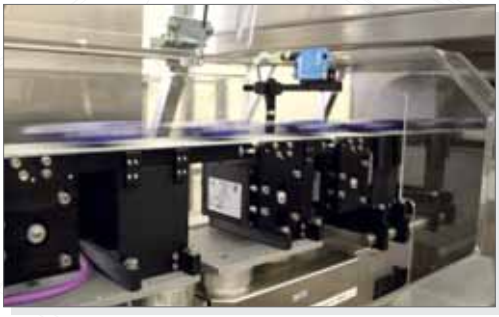
Legal regulations such as the National legal for trade requirements (German abbreviation FPV) ensure the stated amounts are really inside the packing. Modern checkweighers check use either random sampling or a 100% check to find out if the stated amounts are undercut or exceeded. Depending on production speed and external interference effects, considerable requirements are placed on the checkweighers to do just that. For example, if a production plant is exposed to strong vibrations caused by wind or a tram passing by the building, the measurement values are falsified, rendering them useless. A great deal of expertise is required to make sure checkweighers supply reliable results despite such environmental influences.

The Austrian confectionary manufacturer Manner is known far beyond Austria's borders. Latest when talking about Manner wafers or cream-filled wafer biscuits, everyone knows they have once held a Manner product in their hands. The history of the „confectioner's dynasty" halls way back to the year 1890. The company building where the Viennese production plant and company headquarters are accommodated was expanded to today's size even before the First World War. But inside the production rooms, one glimpse of the ultra-modern manufacturing and packing plant drives any nostalgia into oblivion. Manner places high value on quality and reliability – not merely in the products themselves, but naturally also during their manufacture. For the legally required weight control, the confectionary manufacturer relies both in its factory in Vienna as well as in the Wolkersdorf and Perg production facilities on the most modern checkweighers from the Kaiserslautern checkweigher specialists, OCS.

45 Checkweighers for sweets

Overall in the three production facilities, approximately 45 checkweighers from the Kaiserslautern company are being used. The production line for hazelnut waffles places the highest requirements on the weighers. The production lines, matched to each other in detail, start with the manufacture of the waffles. Composed of many delicious ingredients, they move towards the packing machine. Already packed, it then continues over the HC series checkweigher to the robot island, where the waffles are bundled into ten-packs and pushed into cartons for packing.
And the speed here is really conside-rable: depending on the format of the waffles, the weighers have to deal with a throughput of 610 pieces per minute (i.e., at least 10 bars per second) or even with 640 pieces per minute.
Rudolf Schwaighofer, packing technician at Manner, notes: „When we started looking for a weigher manufacturer, one of our main requirements was that the weighers should be able to handle a throughput of 640 pieces

The Viennese Manner company building for production and the company headquarters was expanded to it's current size even before the First World War. The trams passing by the building make tough work for the checkweighers.



The travels of a hazelnut waffle: From manufacturing through packing and checkweigher to the robot island, the individual bars are combined into ten-packs.

per minute. Thanks to individual adaptations made to the checkweighers, our application is possible with the products from OCS Checkweighers. As far as I know, these weighers are the fastest calibrated checkweighers for single packs that are available on the market."

Precise, reliable weighing measurements even with vibrations

Along with the throughput, the confectioner also placed additional requirements on the weighers. The packing technician comments: „The main problem for the checkweighers is certainly the trams that travel by our six-floor production building. It makes everything shake and vibrate. We invited quite a few suppliers and we tested their products onsite. But the problem was always that, due to the vibrations, the weighers were not able to supply correct values so it was not possible to reliably separate out overweight and underweight packages. The only ones that were able to compensate for the vibrations using sophisticated engineering were the weighers from OCS."
To achieve that, the checkweigher specialists rely on so-called Active Vibration Compensation (AVC). Weigh Cells with this active disturbance variable compensators use an additional measurement technology that separately determines the existing vibrations. To do that, multiple sensors detect both translational vibrations as well as rotary shocks. By subtracting the interference signals from the actual weight signal, one obtains a mostly interference-free weighing result. The weight measurement and result output is possible within a few milliseconds at the full measurement speed and with interference suppression of up to a factor of 100. There is no time loss as with conventional filter technologies. The basis of this Active Vibration Compensation is the Electro Magnetic Force Restoration (EMFR) used in the weighers (see box). Simultaneously, a special underframe provides the best possible stability and a full cover contributes significantly to prevent interferences right from the start.

Electro Magnetic Force Restoration

The basic principle of Weigh Cells based on Electro Magnetic Force Restoration can be compared with a simple beam scale. The object to be weighed is placed on one side of the beam scale. Its weight leads to the coil, fastened to the other side of the weighing beam, which moves out of its magnetic field (permanent magnet). An optical system detects even the tiniest deflections and reports that to a high-precision position controller. That uses the coil current to control the electromagnetic counterforce, resulting in the weigher beams remaining balanced. All that takes place in milliseconds, meaning the maximum deflections amount to less than a few nanometres. The force initiated by the applied force is thus compensated by the coil

The knife-edge conveyor minimises the clearance between two belts, providing passing on the products "softer".

Using the In-Process "Request sample" control key lets random samples be ejected for optical packing inspections.

current. At the same time, the strength of the coil current is proportional to the weight. This force-proportional current can be measured through a measuring shunt, digitized with an analogue-to-digital converter and is further processed in a signal processing system for direct output as a digital weight value.

Flexibility, individual adaptations and good collaboration

Another reason the selection fell in favour of the weighers being used is certainly the wide produce range from OCS Checkweighers. On top of that, their checkweighers can be equipped with two Weigh Cells and different weighing conveyor belts. That makes them suitable for weighing short as well as long products. Rapid and secure rejection of false-weight products is possible thanks to an intelligent sequence control and a powerful instantaneous switching valve. At a throughput of 640 pieces per minute, even the high requirements placed on the belt transition points are met. Transferring the products from one weighing conveyor to the next is implemented via a knife-edge conveyor (rolling knife-edges, diameter 6 mm), that minimizes the clearance of both weighing conveyors down to a few mm. That means the products can be passed on „more softly"; furthermore, the product clearances remain within the preset tolerances of +/- 1 mm. To make sure communications between the packing machines and weighers runs smoothly, meaning also the transfer of the waffles from one belt to the next, the weigher specialists work closely with the packing machine manufacturers.

Moreover, the individual products should precisely cycle into the robot island where they are then combined into multipacks. To prevent malfunctions in the production process here, the individual packs must arrive cycle and millimetre exact. That is triggered with a servodrive that is based on an "electronic bevel shaft". Along with weight verification, the packing also needs to be optically random sampled. To do that, random samples need to be extracted from the running production process. That is easily accomplished on the checkweigher touch screen using the In-Process control key „Request sample". The checkweigher experts have created and accordingly programmed these keys specifically based on the wishes expressed by Manner.

Overall, the Austrians are more than satisfied with the weighers. „We exclusively use OCS Checkweighers in all our production plants because none of the alternative products can implement our technical specifications regarding throughput and handling the vibrations" concludes Schwaighofer. „Furthermore, the cooperation is outstanding; the service and commitment is really unique."

The main facts at a glance:

- Weighed product: Hazelnut waffles
- Weigher used: Checkweigher HC
- Throughput: 640 pieces per minute, officially calibrated
- Weighing conveyors: two weighing conveyors with AVC (Active Vibration Compensation) for different product lengths
  - Weighing conveyor 1 < 100 mm
  - Weighing conveyor 2 > 100 mm
- NT17 transport belt technology for optimal belt transitions and secure product handling
- Servodrive for mm-precise „electronic bevel shaft" sequences
- Special underframe with three mounting feet for the best stability
- Completely covered to prevent interference effects
- In-process control for random sampling requirements using a hot-spot key

Press relations
OCS Checkweighers GmbH
Sandra Hubach
T +49.631.34146-8266
F +49.631.34146-8694
sandra.hubach@ocs-cw.com