



Weighing Technology for pharmaceutical and cosmetic products

There is hardly a packaging process that does not involve weighing technology in some form. Thus, the innovative partnership between IWK Verpackungstechnik and WIPOTEC also revolves around inline weighing technology in packaging plants and lines. It is down to the application whether inline weighing is the method of choice or if weighing technology in the form of a checkweigher is preferred. Both techniques have their advantages and for both technologies IWK relies on products from the WIPOTEC Group in Kaiserslautern.

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HC-A 2-lane Checkweigher solution downstream of the tube filler

Innovation: Both parties involved

Two companies that represent an extremely successful collaboration. The partnership aims to use market-leading solutions to exceed the high packaging standards for pharmaceutical and cosmetic products and to apply them in the food and chemical sectors as well. IWK Verpackungstechnik GmbH (Stutensee/Karlsruhe) is well-known for packaging solutions and complete packaging lines in the pharmaceutical and cosmetics sector. The weighing systems integrated in IWK systems make it possible to minimise giveaway (overfilling with product). This applies to tube fillers and cartoners as well as packaging lines. The WIPOTEC Group is known for its checkweighers and inspection solutions (WIPOTEC-OCS) as well as for Weigh Cells and weighing kits (WIPOTEC Weighing Technology). The great innovative strength of the two associated companies is reflected not least in their intensive collaboration in key technologies in these areas.

The innovative technology WIPOTEC brings to this partnership is based on monoblock Weigh Cells which are used in all checkweighers as well as weighing kits at IWK. The key benefit of a

WIPOTEC Weigh Cell is its extremely high accuracy which gives it significant advantages in a variety of production environments. These include, in particular, packaging processes in the pharmaceutical, cosmetic and food sectors since they generally operate at high speeds and work with high throughputs.

Checkweighers: Weighing technology integrated into production processes

In IWK tube filling machines, the individual tubes are fed to the machine manually, semi-automatically or fully automatically depending on the equipment version. The tubes reach the individual work stations (centring, dedusting, filling, sealing, labelling, cutting) via the tube transport system before they are then either discharged from the machine or transferred to a carter for further processing as required. There are two approaches to integrating weighing technology into IWK systems: After filling and sealing the tubes in the tube filling machine, checkweighers from WIPOTEC-OCS are used which results in significant product savings. The reason being the trend control of the tube filling machine which is based on the control signals of the checkweighers.

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Dual-lane troughed belt for tube feeding



Fast and clear format setting

It enables active monitoring of the actual contents during the filling process and minimises overfilling as well as underfilling. The checkweighers can communicate directly with the filling control system of the tube filling machine; the high-tech Weigh Cells used in multi-lane checkweighers ensure maximum precision at top speed. Integrated in the line, checkweighers from WIPOTEC-OCS run synchronously with the IWK tube fillers in single-lane and twin-lane operation, guaranteeing optimum product handling. The throughput is up to 240 tubes per minute. Customers are well-known international manufacturers of cosmetics and pharmaceuticals.

It is furthermore possible and sensible to use checkweighers downstream of the subsequent cartoners. At this point a weight check for completeness is carried out. Additional attribute checks are possible depending on the application, for instance a tab check (check for the correct closure of folding boxes). The products are ejected into separate containers according to the cause of the fault. The compact designs of the WIPOTEC-OCS solutions allow its partner IWK Verpackungstechnik to plan lines with very short overall lengths. The end customer as a line operator enjoys a wide range of advantages based on the innovative partnership between IWK Verpackungstechnik and WIPOTEC-OCS. Short commissioning times are a priority. Several systems have already been successfully installed in the market with the line installation carried out by IWK. Product inspection with the best possible transport and thus ideal product handling can be guaranteed thanks to perfect technical coordination between the machines,

the synchronised motors of the conveyor belts of tube filling machines and checkweighers, coordinated waiting cycles and synchronised restarts.

Weigh Cells: Pick & Place inline weighing

Inline weighing with Weigh Cells, such as those used in systems with very high throughputs, is a further option for integrating weighing technology into IWK packaging lines. In this case, Weigh Cells from WIPOTEC Weighing Technology, integrated in the tube filling machines, take over the tasks of the downstream inline checkweighers of the other version. This mechanically more complex solution can be implemented even more compactly than the version with checkweigher weighing function. It also enables higher throughput, made possible by scalability and equipping the machines with up to 16 Weigh Cells that are fed in parallel.

In Pick & Place inline weighing, the weighing function is integrated directly into the machine, enabling a reduction in the space required for the weighing process and subsequent ejection of the underweight tubes. A look inside the machines shows the differences in the weighing process compared to the use of dynamic checkweighers. A transfer system is used to place filled and sealed tubes directly from the tube filling machine onto static scales; the tubes are weighed and the transfer system then places them into the cartoner's product chain. The number of Weigh Cells is scalable. The weighing systems are equipped with 2 to 16 Weigh Cells depending on the machine type and line throughput.

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Weigh Cell integration to reduce giveaway



Section of the 16-lane system with and without cover

in close proximity to the process. The control parameters enable detection of the smallest deviations promptly and very precisely. This means that corrective interventions can be carried out in time. The result is consistently reliable fill volumes without costly product losses due to underfilling or overfilling. Visualisation of the target/actual states of the individual filling heads also ensures a high level of production reliability for the person responsible for the line during the production process. Ole Normann, Junior Product/Sales Manager at IWK, adds, "Significantly more precise measurement during inline weighing combined with fully automated readjustment guarantees a constant filling weight all the time. The rejection rate can be reduced considerably. In three-shift use, the investment can pay for itself in as little as a year!"

This translates into a maximum throughput of 800 tubes per minute. The Weigh Cells ultra-precise functionality permits implementation for as little as two grams of tube content – an entirely probable application in the pharmaceutical sector. Each weighing station determines the average weight from a number of tubes and then reports back to the filler which enables trend-based checking of weight for automatic control. This is achieved by adjusting the metering stroke with servomotors.

What are the benefits for customers?

Both methods – the use of checkweighers or inline weighing with the help of Weigh Cells – enable complete control of each individual tube with immediate feedback to the filler. What are the other benefits for customers? At the end of the day, given the technical fine-tuning of the individual modules, customers benefit from the high productivity of their plants. With both solutions, information about the weight value for control of the filling heads is available



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