Closing a Gap

From Drying with Compressed Air, through Precision in Dosing, to Conveying "Mikado Sticks"

In the wake of the developments in processing methods, the technology of ancillary equipment is also making advances. The key drivers of the developments are cost savings from increasing the energy efficiency of dryers and greater precision in dosing equipment.

In taking over FarragTech, Wittmann Kunststoffgeräte GmbH, Vienna, Austria, has not only expanded its product range. The strategy behind this move, and the continued development of ancillary equipment were the subjects of our discussion with the company's International Sales Manager for Material Handling.

Kunststoffe: *Mr. Wolfram, what led to the takeover of FarragTech? At K 2019, the dryer manufacturer still had a presence as an independent company – then, by spring, it had been integrated into the Wittmann Group.*
Markus Wolfram: Wittmann already has dryers from about 10 kg throughput in its portfolio as well as a small dryer for amounts up to 1 kg for the Wittmann-Battenfeld MicroPower machine. However, there was a gap in the range between the microdryer and medium sized dryers. Coincidentally, we found out that FarragTech wanted to work together with us, and then we took over the company with effect from April 1, 2020. The talks started after the K show, and we also took on the workforce. The former CEO Aaron Farrag, as head of the compressed-air drying and cooling product division, with his team, now works for us at the former FarragTech Wolfurt site in Vorarlberg, Austria. Since 2015, we have had our bulk material department located in Wolkersdorf, north east of Vienna, and the new staff are now organizationally assigned to this group.

Kunststoffe: *So the dryer models, which are new for your company, do not compete with your existing range?*
Wolfram: No. We now have dryers suitable for small amounts where we previously had to offer oversized units. On the other hand, it gives us the opportunity to penetrate further into medtech with our dryer technology. Since, in contrast to dry-air dryers, compressed-air dryers do not require a drying medium, and therefore molecular sieve, there is no risk – despite the use of filters – of cleanrooms becoming contaminated with dust from the substances used as molecular sieve. In compressed-air dryers, there is no such dust pollution, which is why they are ideal for use in cleanrooms.

Kunststoffe: *But these dryers have the disadvantage that a compressed air infrastructure is required in the company.*
Wolfram: Yes, ideally high-quality compressed air, i.e. free of water and oil. If the customer doesn't have such a high-quality network, he can use membrane dryers as an alternative. Compressed-air dryers operate on the principle that the compressed air in the dryer, which is ideally predried, is decompressed without filtering, during which the dew point falls to -16 °C. That is already enough for drying most plastics. If a membrane-dryer is used upstream, a dew point of -35 °C and lower can also be reached.

Kunststoffe: *How energy efficient can that be? Compressed air networks are often considered very inefficient in practice.*
Wolfram: Compressed air is a relatively expensive resource, some energy saving functions are therefore integrated into the dryers. But at low throughputs, compressed-air dryers have a similar energy efficiency to dry-air dryers, if not better, since the drying medium does not have to be regenerated by heating. In the case of the larger compressed-air dryers of the M, L and XL series and beyond, the material to be dried is predried with warm air in a secondary circuit in order to minimize the dry-air consumption in the primary circuits in these units. With the L and XL units, FarragTech even went a step further: there are optionally equipment designs that operate with "low pressure" compressed air in the primary circuit, which is generated for example in the operation of blow molding machines, and actually cannot be further used after it has been exhausted from the mold. This compressed air is stored and subsequently fed to the dryer so that it can be used for predrying.

Kunststoffe: *But you are working in a small niche here in economic terms.*
Wolfram: Certainly, we see the greater potential in smaller compressed-air dryers, but we also don't want to neglect the market for larger units and, with these models, we will increasingly be turning our attention to the blow molding sector.

Kunststoffe: *Apart from the energy savings, what else is driving the technical development?*
Wolfram: Dry-air dryers with drying agent cartridges for operation alternately in the process and regeneration are increasingly reaching the limits of their performance in view of global warming and therefore greater air humidity levels. For higher power requirements under difficult climatic conditions, our segmented wheel dryers have been becoming more interesting for some years. They were actually created for the climatic conditions that are

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found, for example, in Asia, where it is warmer and more humid. The rotating segmented wheel repeatedly brings the air to be dried into contact with the freshly regenerated, particularly absorbent molecular sieve, so that the dry air quality can be increased.

Kunststoffe: *But the regeneration of the segmented wheel sections increases energy consumption.*
Wolfram: With smart technical measures in both mobile segmented wheel dryers and battery systems, we achieve energy levels that are comparable to conventional dryers. For example, with the Aton segmented wheel dryer with 1000 m^3/h dry-air output, which we first presented at K 2019, we installed a cross-flow heat exchanger, which saves energy by preheating during regeneration. In previous years, we also introduced an automatic frequency control of the drying system, dependent on the material throughputs and materials. That is a practical upgrade for reducing the energy consumption, which operates independently of the dryer technology.

Kunststoffe: *Development seems to be dominated by the issue of energy.*
Wolfram: Energy is indeed at the forefront, particularly in the case of dryers, and has gained even greater importance along with the idea of sustainability. Another development trend is aimed at making life easier for the operator. The focus here is often on easy access to functions, in the case of conveyors, for example, but also the question of how easy they are to clean, and how much time this takes. If a product exchange is required, you can tell how well a conveyor unit is designed by how rapidly you can start it up again. That concerns opening without tools, exchanging filters and subsequent assembly of the unit, which must all be easy to perform. In the case of centralized conveyors, the hose connector must not be in the way if the cover has to be opened again. Easy handling is achieved, for example by swinging aside conveyors, while a folding mechanism always poses a risk of injury if the unit is not laboriously secured using supports.

Kunststoffe: *What is the situation regarding developments in dosing equipment?*
Wolfram: Instead of energy, precision plays the most important role here – the more precisely the components can be dosed, the easier it is to approach the minimum level, for example with expensive pigments, while keeping the value constant.

Kunststoffe: *A precision that ultimately benefits part quality?*
Wolfram: Yes. But precision is relative – in this context it is less a matter of absolute quantities. As long as the desired ratio between the respective components is achieved with good repeat accuracy, it is unimportant whether 800 g is dosed in one batch and 1000 g in the next batch. Put simply, the result is the same whether, with a mixing ratio of 50:50, an amount of 400 g/400 g or 500 g/500 g is achieved. And we can do precisely that with our real-time live scale technology.

Kunststoffe: *Do new materials make new technology necessary?*
Wolfram: With our gravimetric dosing units, we are continually adding new materials and grain sizes, which have to be dosed. For example, long glass fibers of 5 to about 35 mm are used in the automotive sector. Up to 11 or 12 mm, conveying and dosing are not a problem, but from about 15 mm, special algorithms and strategies are required to process such fibers smoothly.

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About the Interviewee

Markus Wolfram has been employed at Wittmann since 2003, at first in assembly, project planning and order processing. From 2007, he worked in Austria and neighboring countries as a salesman for bulk material technology. In 2010, he was made international sales manager for this area.

Kunststoffe: *So 35 mm is relatively exotic.*
Wolfram: Such extremely long fibers – they remind me of Mikado sticks – tend to cause blockages and form bridges. This technology is really not very often requested, but, together with the ever smaller grain sizes, it demonstrates the increasing variability of materials.

Kunststoffe: *How is the Corona crisis affecting the ancillary equipment business?*
Wolfram: The market suddenly slowed at the end of March. The more countries now introduce relaxations, the more activity we will see on the market. We were able to use the time to press ahead with the integration of FarragTech, which gave us new product lines, such as internal mold cooling during blow molding and condensation water protection for injection molds. But we have also made progress in the development of digital interfaces. When business normalizes again completely, we want to be prepared and offer, e.g., Industry 4.0 interfaces such as Euromap 82/OPC UA. There is already demand for control systems in which, for example, the ancillary equipment automatically adjusts to a new mold data set. That offers the advantage that systems can be operated more easily and reliably even with reduced staffing levels. ■

The interview was conducted by Dr. Karlhorst Klotz, Editor.