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TRUST AS A DRIVING FORCE

Dear readers,

As the year 2025 draws to a close, we can look back on another year full of highs and lows. In May, we sadly said goodbye to Lorenz Bohle, who passed away after a serious illness.

He was not only the founder of our company, but his ideas and technical implementations have shaped the entire industry. As a team, we will do everything in our power to preserve his legacy and realize his vision.

The domestic economic environment remains uncertain, and unfortunately, we do not foresee any improvement. The reduction of bureaucracy is still pending. The reforms implemented so far are sobering. There is also uncertainty in foreign policy. New tariffs, the ongoing war in Ukraine and increasing EU bureaucracy mean that our daily work is not getting any easier.

However, we are very grateful that we can rely on a strong team that supports us with expertise and reliability. This team is the foundation of our success. We are set to conclude another highly successful financial year in 2025. We would like to express our sincere thanks to you, our dear readers, for this. It is your trust that drives us.

We have manufactured machines for all production steps. One of our bestsellers is the BFC tablet coaters. We have optimized them technically and are building them in a new design for our customers worldwide. We have delivered the latest generation of coaters to Asia, North America and South America, as well as to Europe. 2025 is the year of the single-pot granulators. We are currently manufacturing three of these systems in parallel: two VMA 600s and one VMA 1200, which has a batch capacity of up to 960 liters.

We remain successful and committed to Continuous Manufacturing. In September, we welcomed 50 participants from four continents to Ennigerloh. Over two days, we showcased our technologies and processes. Above all, however, some companies provided in-depth insights into their journey towards continuous production.

Allow us to give you a sneak preview of what's going to come next year. In 2026, Interpack will open its doors in Düsseldorf. Once again, we will be presenting a world first there.

Dear readers, we would like to thank you very much for your trust, and we look forward to further joint projects. We wish you and your families a wonderful Christmas and all the best for the New Year.

Yours sincerely,
Tim Remmert and Thorsten Wesselmann

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LORENZ BOHLE PASSES AWAY IN MAY AT THE AGE OF 85

His entrepreneurial spirit, values, and ideas remain a guiding principle for people and technology at L.B. Bohle.

As a visionary entrepreneur through-and-through, a passionate engineer, and a man with clear values and vision, Lorenz Bohle shaped not only the company, but also the entire pharmaceutical engineering industry.

His courage to think outside the box and his attention to detail, as well as his tireless commitment to quality and innovation laid the foundation for our company's success of L.B. Bohle Maschinen und Verfahren GmbH.

He led the company since its foundation in 1981 with confidence, reliability and honesty, and he always demonstrated 100 percent commitment.

Management was handed over in 2017

Lorenz Bohle handed over the management of L.B. Bohle Maschinen und Verfahren GmbH to Tim Remmert and Thorsten Wesselmann. As chairman of the advisory board, he continued to be the initiator of technological advances and patents, as well as being a valuable driving force for the company's development.

Since the beginning of 2021, the company has been operating under the umbrella of the Bohle Foundation, which Lorenz Bohle chaired until his death. The continuity of the company was important to him. The foundation ensures the long-term security of the company and its employees' jobs.

A visionary entrepreneur with a great personality

With the passing of Lorenz Bohle, our company has lost not only its founder, but also a role model and a reliable companion and advisor.

His work and vision live on in our people, technology, and ethos of our company. Lorenz Bohle passed away peacefully on 11 May 2025 at the age of 85 in his home in Ennigerloh-Westkirchen.

Funeral service at Plant 4

In a very dignified setting, the Bohle family and employees, partners, customers and friends said goodbye to our company founder. The funeral service took place at Plant 4 on 24 May. The Bohle family and the management would like to take this opportunity to thank everyone who has supported them during this difficult time with their sympathy, comforting words, and other expressions of condolence.

> Continuous Manufacturing is no longer just a vision; it is becoming a reality that we are shaping through our machines and processes.
>
> **Tim Remmert,**
> Executive Director

L.B. Bohle demonstrates Continuous Manufacturing

TRULY CONTINUOUS

Workshop on “Continuous Pharmaceutical OSD Production” inspires 50 participants from four continents

For two days, everything at L.B. Bohle revolved around continuous tablet manufacturing, a key focus topic in the pharmaceutical industry. At the “Continuous Pharmaceutical OSD Production” workshop, 50 industry experts gathered to discuss current developments and share practical experience in the Continuous Manufacturing of solid dosage forms.

Following welcomes from Executive Director Tim Remmert, Sales Director Burkhard Schmidt, Manager Science and Process Engineering Dr. Robin Meier and Business Development Manager Continuous Manufacturing Alexander Seibel, the program began with engaging keynote presentations. Erin Dippold from Merck & Co. in the United States provided in-depth insights into the selection and design of new production processes. She emphasized the straightforward scale-up and the very fast development results combined with low material consumption of the QbCon® 1 continuous granulator and dryer.

“Merck & Co. has been working for many years on introducing continuous twin-screw granulation,” explained Alexander Seibel. The first tests and analyses were launched as early as 2011. “After the desired solution had not been found by 2019, the first trials were carried out on QbCon® 1,” Seibel continued.

Live demonstrations and true hands-on workshops: participants were impressed by the very fast results and the easy handling of the QbCon® 1.

Several series of tests and scale-up trials on the QbCon® 25 system led in 2023 to the purchase of two QbCon® 1 systems. The first unit was built in a containment design for OEB 3. For this purpose, the standard system was upgraded with several additions to increase dust tightness. This unit is used in research and development.

The second machine was built to meet even higher dust-tightness requirements (OEB 4). It is used for clinical trial material manufacturing and features a higher level of automation.

Hands-on experience – insights into real CM projects

Raphael Wiedey from Merck KGaA provided extensive insights in the second keynote on the installation of the QbCon® 1 system, which enables the end-to-end process from powder to coated tablet. After Merck KGaA initially decided in favor of a competitor to L.B. Bohle, the company later changed course and conducted extensive testing of L.B. Bohle's Continuous Manufacturing technology. The order was placed in 2021, and by 2022 the Factory Acceptance Test (FAT) for this highly complex system took place in Ennigerloh.

"The complete line, equipped with extensive PAT (Process Analytical Technology), consists of a QbCon® 1 for continuous wet granulation and drying, as well as a blending and dosing unit – each fully enclosed within an isolator. Additional components include a BTS 100 series sieve, the XL 100 WipCon® tablet press, and the semi-continuous KOCO® 25 coater. The line is fed by two automated HS 400 lifting columns," explains Dr. Robin Meier. In addition to the major process units, the control system for the entire line is also supplied by L.B. Bohle.

"The challenge with this system was integrating components from various suppliers. Gericke AG, Franz Ziel GmbH, and KORSCH AG are involved in the project," Dr. Meier adds.

> Our workshop brings us closer together and places our technology firmly in the minds of the industry.
>
> **Dr. Robin Meier,**
> Manager Science & Process Engineering

Hands-on technology: practical demonstrations convey knowledge

On the afternoon of the first day, after the theoretical sessions, participants were able to see the system in action: during the live demonstration of the QbCon® 1 unit, the experts witnessed its advantages firsthand. Easy handling, fast results, and low material consumption are just a few of the system's benefits.

At the same time, the Technology Center showcased continuous production from powder to coated tablet via dry granulation. With a focus on the BRC roller compactor and the semi-continuous KOCO® coater, participants learned firsthand how fully automated and truly continuous production can be achieved.

"The practice-oriented sessions particularly encouraged intensive dialogue," reflects Burkhard Schmidt. "The many questions from participants

A fully booked conference room: 50 participants from four continents accepted the invitation of L.B. Bohle Maschinen und Verfahren GmbH and gained first-hand insights into the topic of Continuous Manufacturing.

demonstrated not only their strong interest but also their high level of expertise. Many companies are working intensively on implementing Continuous Manufacturing – this workshop absolutely confirmed that," Schmidt reports.

Practical insights and a tour of Plant 3

On the second workshop day, the agenda focused on comparing traditional batch processes with the modern bin-to-bin approach. In the practical sessions, the QbCon® 25 twin-screw granulator and continuous dryer were compared with the VMA single-pot granulator. Another highlight was a tour of Plant 3, where participants were able to see the final assembly of process machinery. In addition to several BFC tablet coaters of the latest generation, they inspected a KOCO® coater combined with the fully automated ROB 50 tablet container handling system and the VMA 1200 single-pot granulator.

After two intensive days full of insights, discussions, and live demonstrations, there was unanimous agreement at L.B. Bohle that the workshop was a complete success. "The response was overwhelming. Our goal was to make Continuous Manufacturing tangible. We achieved that goal and proudly showcased our technologies," concludes Tim Remmert with a very positive summary.

INTERVIEW

Alexander Seibel, born in 1986, found his way to L.B. Bohle after spending more than ten years at Körber. After holding various positions and responsibilities, mainly in Russia and Brazil, he took over the role of Business Development Manager Continuous Manufacturing.

Alexander Seibel, this was your first workshop since you joined L.B. Bohle in 2024. What are your thoughts?

Alexander Seibel: My conclusion is entirely positive. It's impressive to see what we've achieved together. The number of participants, combined with their high caliber, demonstrates that L.B. Bohle is regarded as an expert in Continuous Manufacturing. The selection of suitable participants, invitations and follow-up took a great deal of time. We all did a good job, especially the sales team. The detailed planning was also very time-consuming, but there too, the interaction between the departments was outstanding – effective, experienced, and very communicative. I am proud of what we have achieved.

With 50 participants from four continents, the event was highly international. What are the reasons for this?

L.B. Bohle has never hosted such an international event before – we welcomed participants from 13 countries. To answer the question, we need to consider three aspects:

First, Continuous Manufacturing is becoming increasingly important worldwide. From South America to Asia, many companies are exploring the topic and recognizing the benefits of continuous tablet production.

Second, all our sales teams – both our area sales managers and our global representatives – actively promoted the topic and the workshop. This gave us excellent visibility and ensured the event reached exactly the right people.

Third, L.B. Bohle is a globally recognized brand with an outstanding reputation. In the field of Continuous Manufacturing, we are regarded as pioneers, and our expertise in this area is highly valued.

L.B. Bohle is a pioneer in the field of Continuous Manufacturing. What are the unique selling points?

There are several, but I'd like to focus on the most important ones. Our broad product portfolio is unmatched in the market. From product handling, weighing, and dosing to wet and dry granulation, milling and sieving, blending, and tablet coating – L.B. Bohle offers complete solutions across the entire process chain.

Our partners Gericke and KORSCH AG complement the continuous production line with continuous mixers, feeders, and the tablet press. The excellent cooperation with KORSCH also enables us to fully integrate the tablet press into our SCADA system and implement full automation of the Continuous Manufacturing line.

Automation itself is our second unique selling point. Our team of automation engineers provides customized solutions and implements customer-specific features.

The third unique selling point is the fact that L.B. Bohle can realize continuous production across all relevant processes: direct compression (DC), dry granulation (DG), and wet granulation (WG). Competitors generally focus on direct compression because they lack both a roller compactor and a truly continuous drying solution in their portfolios.

Which brings us to the fourth unique selling point. The BCD (Bohle Continuous Dryer) of the QbCon® WG line enables continuous drying of wet granules – and it does so with a true FIFO (first-in, first-out) principle without any back-mixing of granules in the process chamber. This method highlights one of the key advantages of Continuous Manufacturing: always knowing the exact quality of the product and ensuring that only material meeting the specifications moves on to the next process step. As soon as the system detects an OOS (Out of Specification) event, the material is discharged with minimal product loss. At present, L.B. Bohle offers the only solution on the market that implements this principle and enables truly continuous wet granulation without blocked filters.

Why is the market – and especially competitors – often focused only on direct compression?

I see three clear reasons for this. First, some suppliers simply do not offer any solution for wet granulation and therefore concentrate primarily on the tablet press.

Second, aside from our solution, no other provider has a stable, truly continuous drying process. Competitors transfer the material after wet granulation into a so-called semi-batch drying step, which interrupts the continuous process. Our patented L.B. Bohle solution for granule drying ensures a continuous process over many hours thanks to the product filter and filter-cleaning concept used – whereas competitor systems experience rapid filter clogging.

The third aspect is not competitor-related but customer-related. Many customers want to achieve quick and lean success which often leads them to skip the granulation step altogether. This means the tablet is compressed directly from API and excipients. However, since around 70% of all solid dosage processes involve granulation, it is our task to educate the market about our solutions and bring them forward.

Let's return to the workshop for a moment. What were the results of the first follow-up?

I'm in constant communication with our sales colleagues, and of course we intensified our personal contact with the participants afterward. In addition to follow-up meetings, we have already signed an NDA (non-disclosure agreement) and scheduled trials on our QbCon® system.

We have also already conducted test runs on our QbCon® 1 with an interested party from India. I am very optimistic that we will be able to realize projects as a direct result of the workshop.

A BTC 600 standing directly next to a BFC 600 in our production area at Plant 3 – this impressive scene unfolded just a few weeks ago in our final assembly. For tablet coating, we offer market-leading machines and processes that provide you with significant advantages in terms of productivity, efficiency, and resource consumption.

A look inside Plant 2 in Sassenberg

FULL HOUSE FOR THE YEAR-END RUSH

At our Plant 2 in Sassenberg, we focus on the design and production of handling solutions for tablet manufacturing. “We have been producing our highly demanded systems and process solutions in Sassenberg since 2000. Over the years, we have continuously expanded the site, and the premises are now fully developed,” explains Thorsten Wesselmann, Executive Director.

After the construction building was completed in 2012 and expanded in 2018, the extension of the production hall was successfully finalized in 2024.

Versatile handling applications

“At Plant 2, we build container blenders, milling and sieving systems, lifting columns, containers, and other key components,” Wesselmann reports. “Our team also tackles the biggest challenges and has implemented numerous integrated systems in recent years,” he adds.

Connecting or linking process steps increases efficiency, improves quality, and enhances automation. The realization of containment applications has also become part of the daily routine for the highly skilled team.

> Plant 2 in Sassenberg is an absolute constant in our business development. Our handling systems, especially complex solutions, are in high demand worldwide.
>
> **Thorsten Wesselmann,**
> Executive Director

Dry granulation

BRC DRY GRANULATORS ENSURE EFFICIENT PRODUCTION OF ORAL SOLID DOSAGE FORMS

When developing tablets, three common technologies are typically considered for producing solid dosage forms: direct compression, wet granulation, and dry granulation with a dry granulator. While wet granulation remains the most widely used method, it has limitations for moisture- and heat-sensitive active ingredients and is also labor-, cost-, and time-intensive.

Continuous dry granulation, or roller compaction, has been an established method in the pharmaceutical industry for decades and excels not only with moisture- and temperature-sensitive products. It offers numerous advantages, such as lower production costs, reduced energy consumption, and a smaller environmental footprint. In addition, it enables straightforward scale-up from development to cGMP production using the same equipment.

"We launched our first dry granulator at L.B. Bohle back in 2012," reports Thorsten Wesselmann, Executive Director, who oversaw the development of the system. "Since then, with the BRC 25 and BRC 100, we have created a true success story, as our machines stand out clearly from others on the market in terms of cost-effectiveness, efficiency, cleaning, and ease of operation and maintenance. Today, the BRC systems are among the most sought-after solutions worldwide when it comes to flexible, scalable, and validated dry granulation processes," Wesselmann explains.

Flexible across multiple industries

In the pharmaceutical industry, the dry granulation process is used to produce tablets, capsules, pills, and effervescent products. In recent years, this technology has gained further attention due to its efficiency and the growing importance of Continuous Manufacturing. The BRC is also increasingly used by CDMOs (Contract Development and Manufacturing Organizations) and CMOs (Contract Manufacturing Organization), who benefit from short product changeover times and reproducible results.
Dry granulation is also used in the food industry – for example, in the production of dietary supplements, vitamins, spices, flavors, soups, and sauces.

In the rapidly growing nutritional supplements industry, dry granulation is used to produce multivitamin formulations, plant extracts, and protein

powders, among others. The resulting granules are then – similar to the pharmaceutical industry – compressed into tablets or filled into capsules.

In the chemical industry, dry granulation improves the handling and storage properties of materials. This makes it ideal for producing anti-caking agents, food colorants, catalysts, and cleaning agents. Dry granulation is also used in agriculture – for example, in the processing of fertilizers, pesticides, and insecticidal powders. Here, it provides improved product properties and reduced quality variations.

How the machine works

In roller compaction, a blend of active ingredients and excipients is compressed between two counter-rotating rollers and formed into so-called ribbons. The goal of granulation is to transform fine, non-compressible powders into coarser agglomerates that can later be compressed into tablets.
The rollers may be arranged horizontally, vertically, or in an inclined position. "At L.B. Bohle, we use horizontal systems. These offer better ventilation of the feed screws and a short discharge path," explains Wesselmann. In the compaction zone, the main densification occurs through deformation or particle fracture.

Modern systems feature adjustable roller gaps that are continuously measured and automatically controlled. This ensures uniform ribbons with defined thickness and porosity. Pressure and gap width are monitored by sensors. With integrated Process Analytical Technology (PAT), all critical process parameters can be monitored and automatically adjusted in real time – an essential component of Quality by Design (QbD). Another advantage of the BRC is that the low fines content in the granulated material eliminates the need for recirculation.

"After compaction, the ribbons are milled in a sieve. With the BTS (Bohle Turbo Sieve) and BRS (Bohle Rotary Sieve), we offer two excellent solutions for achieving the desired particle size and required throughput," says Wesselmann. Changing the sieve inserts is fast and uncomplicated.

Electromechanical drive instead of hydraulics

Since its market introduction, the BRC has been driven purely electromechanically. Unlike hydraulic systems, this technology is more sustainable, resource-efficient, and requires less maintenance, as no oil changes are necessary and there is no risk of leakage in the cleanroom. In addition, energy consumption is reduced because no oil cooling is required.

Hygienic design and easy operation

The BRC 25 and BRC 100 models from L.B. Bohle are compact plug-and-play machines. All components are fully integrated – no external control cabinet is required. "During the design and construction of the machine, we placed great emphasis on operation, maintenance, and assembly," Wesselmann explains. "Thanks to the low height, no platform or ladder is needed. The hygienic design enables tool-free assembly and disassembly in less than ten minutes. We also do not require any costly handling device for changing the rollers."

The large front door ensures quick access, and the rollers can be positioned easily via a tongue-and-groove connection.

The machines are made entirely of stainless steel and include a standard WIP (Washing in Place) cleaning system, ensuring fast and automated cleaning.

High flexibility and integration

The BRC dry granulators support production rates from <1 to 400 kg/h and are suitable for both small and large batches. They can operate as stand-alone machines or be integrated into a continuous production line.

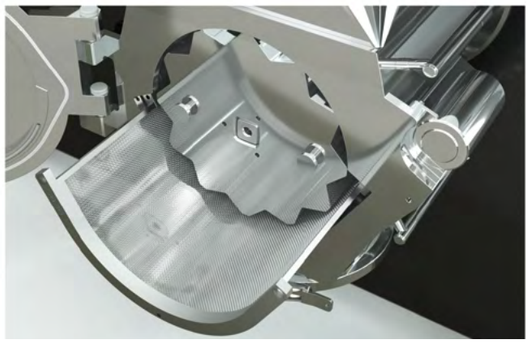
Furthermore, the BRC can be integrated into Enterprise Manufacturing Systems (EMS), historian databases, and customer-specific domain structures.

Containment? No problem!

Containment continues to grow in importance in the pharmaceutical industry. It refers to the safe enclosure of toxic or sensitive substances to protect both people and the environment.
L.B. Bohle offers containment solutions up to OEB 5 for its dry granulators, including integrated isolators, glove boxes, and specialized containment ports. This ensures fully enclosed and safe operation even when processing highly potent substances.

Conclusion

Dry granulation with the BRC series from L.B. Bohle stands for efficiency, precision, and safety. With its electromechanical drive, hygienic design, and high degree of automation, it provides optimal conditions for modern tablet production – continuous, sustainable, and cost-effective.



After compaction, the ribbons are milled in a sieve. With the BTS (Bohle Turbo Sieve, below) and the BRS (Bohle Rotary Sieve, above), we offer two excellent solutions for achieving the desired particle size and required throughput.

L.B. Bohle and KORSCH AG were delighted with the excellent visitor numbers at their joint booth at CPHI.
On an area of roughly 60 m², the two companies impressed the professional audience with four exhibits.

L.B. BOHLE AT CPHI 2025

The CPHI in Frankfurt (October 28–30, 2025) was a great success for L.B. Bohle. "After our first participation in 2022, we once again experienced three intensive trade fair days," says Tim Remmert.

"With more than 60,000 visitors, CPHI was certainly one of the highlights of this year's trade show calendar," summarizes Tim Remmert, Executive Director. "I was positively surprised by the quality of the visitors. We were able to welcome decision-makers, buyers, and experts from R&D and production to our booth," Remmert continues.

Shortly after the start of the trade show, L.B. Bohle was pleased to see a high number of visitors at booth F16 in Hall 9.0. For the second time, L.B. Bohle presented itself together with its partner, KORSCH AG. "Our collaboration with KORSCH AG at major industry events was once again a great success," says Tobias Borgers, Head of Marketing. "With two exhibits per company, we made optimal use of the booth space and were able to give visitors valuable insights into our technologies," Borgers adds.

Exhibits attract numerous visitors

Unlike other companies that refrained from showcasing equipment, L.B. Bohle displayed two machines from the field of Continuous Manufacturing: the BRC 25 dry granulator and QbCon® 1. As a result, many discussions at the booth focused on continuous production, its advantages, and the transition from batch to continuous processes.

The dry granulators of the BRC series enable high production capacity with minimal material loss. This is achieved through fast and precise force control of the compactor rollers using a purely electromechanical drive. The BRC regulates the roller gap in an innovative way and ensures uniform compaction of the material across a wide production range from <1 to 400 kg/h. In addition, the granulators impress with their high operator comfort and fast, effective cleaning using WIP nozzles.

With QbCon® 1, L.B. Bohle offers the ideal entry-level system into Continuous Manufacturing. The truly continuous wet granulator and dryer for R&D, clinical batch manufacturing, and small-scale production ensures improved product quality while increasing flexibility and operator safety. Moreover, reduced resource consumption lowers costs, and process analytics shorten development cycles. In contrast to competing systems, QbCon® 1 enables a stable, truly continuous process without the formation of sub-batches and without filter blockage.

Positive conclusion at the end of the trade show

"All three days of the show, we had numerous high-quality visitors at our booth," says Remmert. "The presence of all major competitors also demonstrates the strong importance of CPHI in Frankfurt for the industry," he adds.

In 2026, CPHI will take place in Milan, Italy – and L.B. Bohle will once again be present, together with its Italian representative, G.B. Gnudi.

A LOOK BEHIND THE SCENES

In Pratteln, Switzerland, the L.B. Bohle team had the opportunity to shoot exclusive footage at its long-standing customer Konapharma AG, a company of the internationally active Renopharma Group.

This was a rare opportunity, as filming in an active production environment is anything but standard practice in the pharmaceutical industry.

During the two days of shooting, Tobias Borgers (Head of Marketing) and the film team gained fascinating insights into modern drug manufacturing and experienced firsthand how L.B. Bohle equipment shapes daily production at Konapharma.

Long-standing partnership and equipment from a technology leader

"In recent years, we have supplied Konapharma AG with equipment for weighing, granulation, blending, tablet coating, and product handling," says Borgers.

The partnership began back in 2002/2003 with a container blender and storage containers. Since then, the number of L.B. Bohle systems has steadily grown. Today, Konapharma relies on two tablet coaters from the BTC series as well as three compact granulation systems.

The granulation system seamlessly integrates the individual components – high-shear granulator GMA, wet sieve BTS, fluid bed system BFS, Bohle Uni Cone BUC®, cyclone separator, and dry sieve BTS – into one unified process. Process design, cleaning, control, explosion protection, zoning, and qualification are all closely coordinated.

Authentic insights into the collaboration

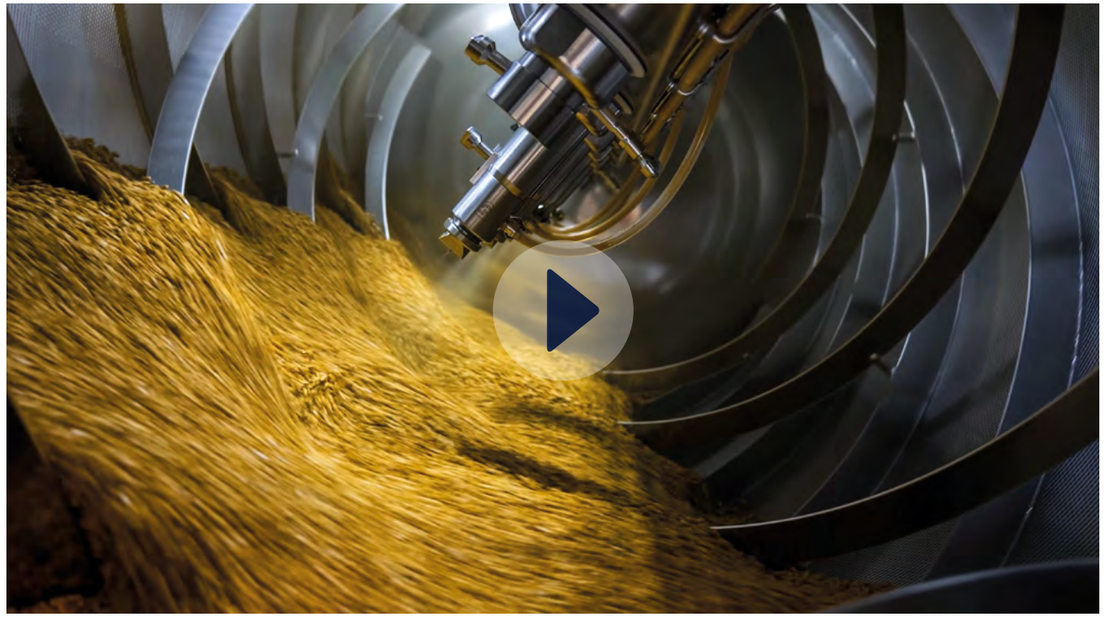
The goal of the film production was to capture an authentic view of the partnership and the technology in use.

"Dr. Thomas Koy, CTO of Konapharma AG, and his team were open and supportive of our ideas at all times," recalls Borgers. "The result is impressive footage from ongoing production – combined with strong statements that highlight how our machines create real value in daily operations."

A heartfelt thank you

A big thank you goes to the entire Konapharma team for their openness, trust, and excellent cooperation.

Take a look and get a genuine glimpse into the day-to-day production at Konapharma AG:



People and machines: In just two days of filming, an impressive video was created that provides deep insights into Konapharma AG and its long-standing collaboration with L.B. Bohle.

> Konapharma AG was open and supportive of us and our ideas at all times.
>
> **Tobias Borgers,**
> Head of Marketing

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