

diagram

#185 / November 2022

the Bühler magazine

Putting

the
pieces
together

**SERVICES ARE
THE SOLUTION**

**ALL THE PIECES YOU NEED
TO CREATE YOUR SUCCESS**

**A CUP YOU CAN EAT
WITH YOUR COFFEE**

**REPLACING SINGLE-USE PLASTIC
WITH AN EDIBLE ALTERNATIVE**

**AFTER THE FIRE: A
STORY OF RECOVERY**

**HOW A MILL IS REBUILT WITH
A VIEW TO THE FUTURE**

The next level of
optical sorting.

Advance your sort process with the all-new MerlinAi powered SORTEX H SpectraVision.

The SORTEX H SpectraVision is an all-new optical sorter with a range of benefits to offer:

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-  Full color and InGaAs cameras designed in-house, optimized for optical sorting
-  Save time and money with fast data-based decisions
-  The most simple to use optical sorter on the market

Learn more at
buhlergroup.com/sortex-h



EDITORIAL



**STEFAN
SCHEIBER**

CEO BÜHLER GROUP

DEAR READERS, looking after another's needs – that is the essence of service. This issue of Diagram is dedicated to the topic because we see service as a game changer. With services, we help you not only to keep your machines running as efficiently as possible, but also help you to drive your business while enabling you to reduce your environmental impact. Service encompasses so much – from ordering a simple spare part to co-creating new solutions. That's why we have transformed our service offering so that you can pick out and put together exactly the pieces that fit for you.

It all comes down to a relationship. Strong relationships are fertile grounds for creative thinking and innovation. I am as excited today as I have ever been about the potential of innovation to solve some of our most pressing challenges. I see our service offerings as a key driver of innovation. Take Delta, a pioneer in the optical thin film coating industry whose technologies enable modern medical diagnosis and drug discovery. Bühler has been at Delta's side for 20 years, supporting them with services and collaborating with them as they grow to meet changing market requirements.

Our job is to be at your side through thick and thin, and we are especially proud to count small and mid-sized businesses among our customers. For example, when Mulino Maroggia, a small industrial flour mill in Ticino, Switzerland, was destroyed by fire in 2020, the owner, Alessandro Fontana, called Bühler immediately. Even before the last of the flames were put out, we were in contact, helping him plan a route out of the catastrophe. We have accompanied his company every step of the way to rising from the ashes. In May 2023, his new rebuilt mill will go into operation.

That's what I love about relationships with our customers – together we can make wonderful things happen. And thanks to our advanced digital technologies, we can offer an extra level of support. One example is the Al-Hazaa Investment Group in Jordan, whose new mill is designed to be highly versatile, enabling the production of a wide range of flours to meet local market demand. With our digital platform Bühler Insights, they can optimize plant efficiency, reduce energy consumption, and minimize waste. This is not just good for business, it also helps Al-Hazaa play a key role in ensuring regional food security in a sustainable way.

Serving a wider purpose is something that I know many of you have at the core of your business. We saw that at the Networking Days. Supporting you is our greatest achievement. Together we can make a positive impact at a scale the world needs.

Sincerely yours,
Stefan

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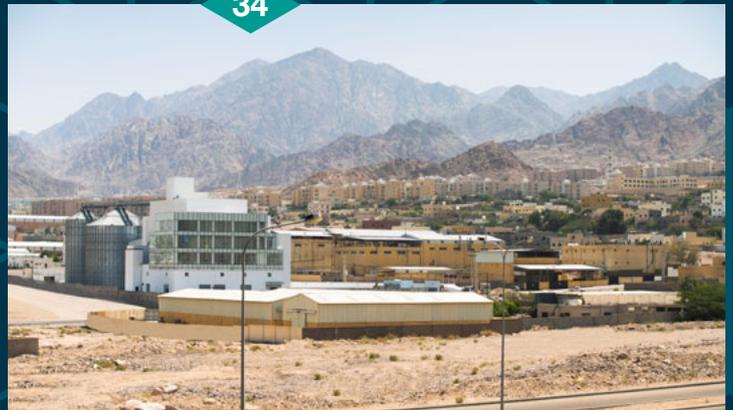


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Success is built on many different pillars. With its wide range of services, Bühler helps customers achieve their long-term goals. Find out how you can put our service solutions together to create better outcomes.



PUTTING **THE PIECES** TOGETHER

TEXT: JANET ANDERSON, LUKAS NAEF



What is service? It is an age-old idea founded on the notion of helping others and caring for their needs. In manufacturing, it starts with supporting customers when things go wrong. That is just the beginning. Bühler is transforming its service offering to go broader and deeper, creating true partnerships with customers to help them achieve their goals over the long term.



INSTALLING YOUR EQUIPMENT

We provide complete machine installation for your equipment. Call us 24/7 to get your job done. We are on duty day and night. We train our 680 service engineers worldwide to handle your equipment and processes with 15 days of training for each engineer every year. Our highly skilled and trained staff worldwide are committed to delivering the highest quality of service as fast as possible.

ABOUT 2,000 KILOMETERS off the southeast coast of the African continent, east of Madagascar, lies the island of Mauritius. Palm trees, clear blue water, and a tropical climate are only a few of the perks the island nation benefits from. However, its remote location also means that it has to produce as many of the staple foods it needs as possible.

Les Moulins de la Concorde is the only flour mill on the island. It has been in operation since 1987, and plays a critical role in supplying staple foods to the island's 1.2 million inhabitants. Downtime, low efficiency, or even a complete shutdown would have a direct impact on the island's food supply. Ivan Yardin, Head Miller of Les Moulins de la Concorde puts it quite simply: "We must run, we have to deliver, and reliability of all the machinery is of utmost importance."

The machinery that Yardin is referring to is a mix of older and newer generation milling equipment from Bühler. Over the last 30 years, the business relationship has grown into a partnership that focuses on sustainable service solutions.

Continuous automation upgrades and connecting the plant to the digital platform Bühler Insights has led to a transparent overview of their processes and production. From yield management through to overall equipment effectiveness, and predictive maintenance information, it all helps to ensure uninterrupted production. With the ProPlant service, preventive maintenance tasks can be managed online for better efficiency and availability of the equipment. Furthermore, by optimizing processes, the plant now consumes 4 percent less energy – paving the way for a more sustainable future for Les Moulins de la Concorde.

The partnership between Bühler and the flour mill that the Mauritian people rely on proves that service goes far beyond the delivery of spare parts

and call outs. While these are still essential elements, a model of service in which the customer only has contact with the supplier when there is a breakdown or an emergency is one that fails to exploit the full potential of that relationship.

Spare parts, calls outs, and beyond

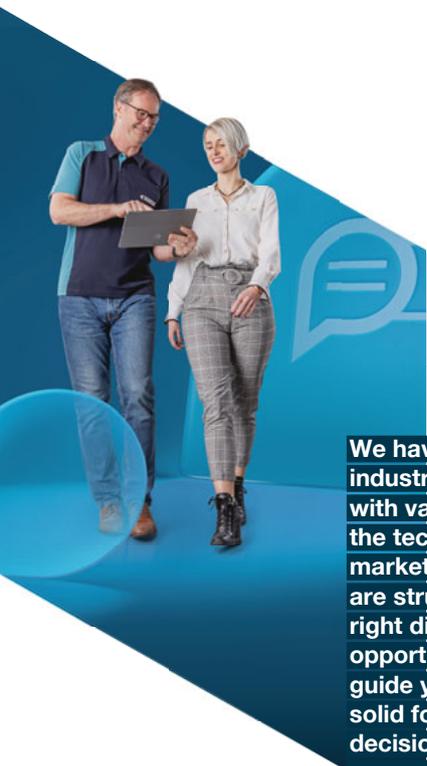
At Bühler we have always had a different approach to service. We believe firmly that services are a key driver of our customer's success. That is why we offer a broad service portfolio, starting with spare and wear parts and inspection and maintenance services, but also including more advanced services such as consultancy services for food and feed safety and equipment upgrades. And now we are taking our services portfolio further.

"Our customers are at the heart of our service culture because we recognize that we are only successful if they are successful," says Tjark de Vries, Head

MAINTAINING YOUR EQUIPMENT

Prolong the life of your machine, increase uptime, ensure consistent output and help reduce operating costs. We differentiate between three basic types of maintenance approaches: reactive, preventive, and predictive. To find the best service solutions for your installed asset's uptime improvements, considering all dependencies, we will jointly develop the concept to address your challenges and targets.





**EXPERTS
WORKING FOR YOU**

We have over 160 years of industry and process expertise, with valuable insights on both the technical and the latest market know-how. Whether you are struggling to choose the right direction or looking for new opportunities, we are here to guide you. Expert services create a solid foundation for sustainable decision-making to steer your company toward its short- and long-term goals – directly one to one or via our Remote Support.

of Global Customer Services at Bühler. “For us, service means protecting our customers’ investments and enabling them to get the maximum return and profitability throughout the life cycle of their assets.”

At your side when you need us

Fundamentally, service is about a relationship, and for a relationship to function well, it requires an understanding of the other’s needs. It means not only providing technical expertise but also listening to each customer’s specific requirements, understanding where their pain points lie and which opportunities they want to pursue.

The key to this is proximity – and this is where Bühler’s global network is a strength. “We are present around the world – we have people where our customers are, at all our service and sales locations,” explains de Vries. The Bühler experts in the field have gained a deep understanding of the pressures that customers face.

“Our customers are in the production business. Fundamentally, they are all in the business of producing parts per minute or tons per hour at a certain quality,” explains Patrik Meier, Head of Service Offering Portfolio at Bühler. “They want to achieve that quality all the time and with reduced environmental impact. And for food and feed manufacturers, food hygiene is an important requirement. But fundamentally, all our customers want to know how many tons they can produce per hour and how they can get one ton more. If we can help them

THE BENEFITS



Cost reduction

Supporting you in reducing operational costs in your production



Personnel & machine safety

Helping you increase and ensure safety for personnel, machines, and the environment



Uptime

Improving availability and reliability



Capacity

Helping increase the output of your production in volume or diversity



Food & feed safety

Supporting you in increasing food safety and adhering to regulations



Sustainability

Helping make your production more sustainable (less energy, waste, and water)



Innovation

Enabling you to innovate, develop, and test new products and processes



Quality

Helping you to increase the quality of your production output on a consistent basis



Lifetime extension

Enhancing your assets to ensure a longer productive lifetime

increase reliability, availability, output per hour, or profits per hour, we are doing our job right.” To achieve this means not just relying on the classic idea of service but going further – it requires a shift from a reactive model to a proactive approach.

This is reflected in the changing nature of customers’ requests. “We have seen growth in inspection and maintenance contracts. In addition, a lot of the work we are doing for our customers now is around plant modernization, where the focus is on helping them improve their existing assets,” explains de Vries. “In general, we are seeing more customers sign up for longer term agreements. Customers want to collaborate with us to cover their needs; they want a deeper partnership and a reliable partner.”

A deeper relationship

At Bühler, the journey toward this services transformation started during the pandemic. “The challenges we and our customers faced brought us even closer together,” explains Martin Staeger, Program Director Service Transformation at Bühler. “As a result, we set about developing our service portfolio further and reframing it so that customers could clearly see the benefits of each type of service we offer and, on that basis, choose the service or bundle of services that suit them best.”

The Bühler service portfolio is now founded on nine main benefits. They include cost reduction, personnel and machine safety, uptime, capacity, food and feed safety, sustainability, innovation, quality, and lifetime extension. “These benefits are weighted differently depending on the type of industry,” Staeger says. “But performance is the number one requirement for all customers.”

Another factor that is growing in importance for many customers is the topic of sustainability. Whether it is led by increasing levels of regulation, or market pull from their own customers, or their own

sense of purpose, reducing the environmental impact of production is becoming an important criterion in several industries and regions. Here, again, services provide the key.

“We have over one million machines installed worldwide with more than 25,000 customers, and billions of people cover their basic needs for food and mobility every day with products manufactured using Bühler technology,” de Vries explains. “By ensuring that our installed assets in the market run more efficiently, by reducing energy and water use and reducing waste, we and our customers together can make a major contribution to tackling this challenge.”

Services are the biggest lever to achieving this goal. Service provision has always been about reducing downtime, improving efficiency, lowering operational cost, and increasing overall profitability. Now this has become a key part of the way in which we will tackle other challenges as well, as each service has a positive impact on CO₂.

For example, preventive maintenance and upgrades help keep machines in operation for longer, meaning more value can be obtained out of the existing asset, and digital services help save energy by increasing efficiency.

UPGRADING YOUR EQUIPMENT

Give your plant a second lease of life with a retrofit service or extend the lifetime of your machine with a factory revision. Do not miss the opportunity to increase the productivity of your production lines. We offer several upgrade kits for complete overhauls of your equipment, adding up to 10 years to your machine's lifetime.



PROCESS OPTIMIZATION

Let us become your proactive partner to support your operation, and maintain and optimize your assets and process performance. We offer holistic views on the operations, condition, and performance of your assets. Our goal is to improve your productivity by looking at your entire process, analyzing it, and implementing sustainable solutions that increase your process consistency. Together with our experienced experts, we tackle quality issues with fast short-term fixes and recommend long-term improvements to ensure a stable process.

KNOWLEDGE FOR YOU

Your people play a key role in the performance and quality of your production. Our experts help develop competencies and boost your business.

With over 160 years of engineering expertise, we share our deep knowledge in various classroom and on-site trainings, so that your staff better understand the plants and processes in order to drive the best outcome and maintain efficiency and safety. Learn from our research and analysis solutions to keep up in a competitive market and find new opportunities by evaluating and analyzing your individual challenges.



HARDWARE YOU NEED

In the event of a breakdown, you need the necessary spare parts as fast as possible – we ensure you have high-quality parts, wherever and whenever needed. That is why we run stock centers worldwide, so you can get quick access to spare and wear parts around the world. Simply place an order online 24/7 on myBühler, our convenient customer portal.

“As we looked at our service offering, we realized we could do even more – there remained significant unexploited potential that we could leverage to help our customers meet the growing challenges they face every day. From rising energy costs to increasing safety requirements and sustainability improvements, services can provide solutions covering the entire value chain,” says de Vries.

It's the outcome that matters

Bühler's new framework of service offerings, comprising classical and digital, leverages this potential to benefit our customers. “By offering service bundles, we can integrate engineering, process, and data analytics know-how to optimize the entire line or plant and achieve better business results,” Staeger explains. “But this also enables us to address broader business KPIs like enhanced productivity and innovation in a project process that is agile and co-creative. Indeed, the most recent step we have taken involves a complete turnaround of the model for service delivery: Instead of guaranteeing our own performance, we now work closely with our

customers to guarantee the outcomes that they define together with us.” This means that the goal of our services is no longer described in terms of only delivering a properly functioning machine, but rather in terms, for example, of delivering productivity gains. And rather than thinking of terms of helping to optimize business processes, we now think in terms of how we work with our customers to improve their KPIs.

“It is about the benefits – instead of talking to customers about machines or inspections, we talk about results,” says Meier. This change in approach is so fundamental, it is also reflected in the way services are priced: “It means payment to Bühler is derived one to one from customer value,” he says.

Co-creating value and success

This represents a revolution in how we think about our business and our relationship with our customers. It brings deeper levels of collaboration. To achieve it requires developing a deeper understanding of our customers' value chains. It means that we take on part of the risk. We are no longer just a supplier but a partner in the enterprise.

It is also a longer-term approach that drives innovation and creates new business models. This means that the value our customers derive from us grows over time, and it demonstrates that efficiency, sustainability, and better outcomes can all pull in the same direction. “We are on a journey. When we started our service transformation, we envisioned getting even closer to our customers wherever they are located and offering flexible, customized packages to meet their specific needs,” says de Vries. “We realized we can do much more, because we have big assets in terms of our technological know-how and process knowledge used to design and engineer machinery and plant. We want our customers to have access to that knowledge throughout the full life cycle of their assets. Our customers think about operating 365 days a year, and we do too.”

FROM PROVIDER



TO PARTNER

Without optical filters, many of today's high-tech applications would not be possible. Since the 1970s optical filters have enabled new and ingenious ways of harnessing different wavelengths of the electromagnetic spectrum for a wide array of applications. Denmark-based Delta Optical Thin Film A/S is a key supplier and pioneer in this industry, providing custom designs and manufacturing to their customers. Optical filters and precision optics have also become more widespread in high-volume consumer products, which has led to a significant increase in demand. This is especially pertinent for medical applications, such as cancer diagnostics and

to a preventive maintenance plan with Bühler. Now maintenance is meticulously planned and executed, based on data driven insights, and performed at the optimal opportunity. Additionally, augmented reality glasses provide Delta with fast remote support that is always available, meaning that a Bühler process expert is always at hand. The finishing touch is the customer portal myBühler. Here Delta can always check which spare and wear parts are needed for which machine and they can be directly ordered online. Parts that are needed on a regular basis can be scheduled and deliveries tracked.

VIDEO



Watch the video about Delta Optical Thin Film A/S to learn how they benefit from services.

Covid-19 tests, where quality is of utmost importance. To ensure minimum downtime in operations, Delta moved from a reactive

Want to read more?

Read the full article about Delta on pages 26-33.

SERVICES USED:

- + Hardware you need
- + Experts working for you
- + Maintaining your equipment

BENEFIT:

- + Lifetime extension



TRADITIONAL FEED PLANT

GOES DIGITAL



Herbert Lugitsch und Söhne Ges.mbH is an Austrian family business with long-standing tradition in feed production. Nestled within the rolling hills of the Styrian province, close to Graz, they know their way around feed production and put a strong emphasis on innovation, quality, and regional value chains. For a company that has been active since 1909, staying at the forefront of technology is key. In 2021 these efforts culminated in a modernization project unlike any other. The existing machinery was completely unified within the plant control system. A fully digitalized production record serves as the basis for future endeavors and service solutions. Bühler's lead modernization manager for this project, Adrian Staerkle, was closely involved from the beginning. "We started this project with on-site visits to get a feel for the plant and the machinery in use. Over the course of the project, we would visit many more times and were able to become partners in this endeavor," he says. Due to the complex nature and historic growth of the plant, extensive preparations were necessary before the modernization could be fulfilled. But the efforts paid off: When everything was ready and the on-site work could begin, it took the automation engineers only 36 hours to bring all 24 production lines back into operation with the new system.

VIDEO

Watch the video about Lugitsch und Söhne Ges.mbH to learn how they benefit from services.



SERVICES USED:

- + Experts working for you
- + Maintaining your equipment
- + Upgrading your equipment
- + Installing your equipment
- + Knowledge for you

BENEFIT:

- + Uptime



KEY TO

SUSTAINABILITY



To brew beer in its purest form, only four ingredients are needed: barley, hops, water, and yeast. North Carolina-based Epiphany Craft Malt has dedicated itself to producing high-quality malt products for the brewing industry that are sourced in their region. Collaborating with local farmers and likewise distributing their products to the regional craft beer and distilling scene are the results of their dedication to sustainability. They are mindful of the impact their processes have on the environment and have committed themselves to becoming carbon neutral in their operations and reducing the environmental impact of their product as much as possible. No easy task, especially since the drying step of malt production is very energy intensive. Out of this, a collaboration between Epiphany Craft Malt

and the Bühler sustainability team began. Sebastian Wolfrum, owner of Epiphany, is convinced of this approach: “It’s been incredible to have a team that not only understands the malting process, but the entire value chain from our farmer’s fields to the brew catalogue,” he says. To understand which solutions could be implemented to what effect, a sound foundation was needed first. A product impact assessment established a baseline and highlighted the carbon emission hot spots along the value chain. Based on these insights, informed action can now be taken and implemented, such as targeted modernization and digital solutions on the existing equipment.

VIDEO

Watch the video about Epiphany Craft Malt to learn how they benefit from services.



SERVICES USED:

- + Process optimization
- + Installing your equipment

BENEFIT:

- + Sustainability



FROM PROVIDER TO CO-CREATOR



Investing in a Bühler solution means investing in a partnership. Willi Grüninger AG is a third generation, family-owned milling company from Switzerland. Situated in the eastern part of the country, they have been a Bühler customer for many decades. A close relationship and collaboration like this is the ideal setting for co-created innovation. Together with Grüninger, Bühler developed the Temperature and Vibration Management (TVM) service, an integral step towards the smart mill. Sensors installed in the roll measure its temperature and vibration during operation. This led to new insights – for example, that during grinding the product is concentrated in the middle of the roll, causing more wear in this area and an unwanted, uneven temperature increase. This was mechanically solved and now, with a more even product distribution, the grinding process is more efficient, quality has been increased, and energy can be saved. Installing TVM also enhances the digital and automation capabilities of the mill. Essentially, the sensor is a key data point that is visualized with Bühler Insights. This enables the operator to take immediate and targeted action if necessary and establishes a new data set relevant for performance and efficiency reviews.

SERVICES USED:

- + Process optimization
- + Experts working for you

BENEFIT:

- + Quality



VIDEO

Watch the video about Willi Grüninger AG to learn how they benefit from services.





THE OUTCOME IS

THE SERVICE

Caramuru Alimentos has been active in the Brazilian agricultural sector since 1964. Besides being the largest Brazilian-owned soybean processor, they also focus on processing corn, sunflower, and canola into oil and the corresponding side streams. Dedicated to sustainability, Caramuru constantly strives to improve its processes and efficiency. In a company this large, with such a wide portfolio and array of processes, defining clear goals and KPIs is the first step. Together with Bühler, with whom the company has been working since 1989, two clear goals were defined in the first phase: to reduce the flake thickness variation, which consequently helps to achieve the second goal, to reduce the residual oil content in the meal, meaning increased efficiency in soy oil production. The

result was that flake thickness variation was reduced by 20 percent and the residual oil content in the meal reduced by 36 percent. During this time all service measures and improvements were monitored against these indicators to track the progress on a weekly basis and review it in monthly meetings. The difference to a more traditional service approach is that the desired outcome was defined with clear KPIs at the beginning of the project, and these are linked to contractual obligations. Already qualitative results have been achieved, such as a reduction of overall maintenance costs and higher equipment reliability. After the first phase all KPIs were met, resulting in a more efficient oil extraction process for Caramuru, and the contract was renewed for the next phase. This new business model enables Caramuru and Bühler to align their objectives and deliver true value through services. Furthermore, it is the ideal basis for future collaboration.

VIDEO



Watch the video about Caramuru Alimentos to learn how they benefit from services.

SERVICES USED:

- + Process optimization

BENEFIT:

- + Capacity



THE FACTS

140

COUNTRIES

where Bühler
is present

14,000

MACHINES

are continuously
enhanced with preventive
maintenance agreements

> 1 MILLION

BÜHLER MACHINES

installed globally in the
plants of more than
25,000 customers

680

**FIELD SERVICE
ENGINEERS**

on six continents

104

service stations
around the world

500

CUSTOMERS

visited by Bühler
service technicians
every day

23

COUNTRIES

with Application
& Training Centers

32,000

DIFFERENT PARTS

on stock in
nine locations



Find the service that
is right for you on the
Bühler Services website.

FORGING A NEW FUTURE

TEXT: STUART SPEAR
PHOTOS: THOMAS EUGSTER

Ticino is Switzerland's rice growing region. On the northern shores of Lake Maggiore, near Ascona and Locarno, wetlands are used for the cultivation of risotto rice.

FOR RICE PROCESSING



Ticino, the southernmost canton of Switzerland, is recognized for its uniquely Mediterranean climate, its world heritage sites, and its cuisine. The region has also made a name for itself in cultivating rice. Delica AG is one of the first producers of rice in the country to have a highly advanced rice mill where digital innovation is driving improvements in yield, quality, and operating efficiency. It has many years of experience processing rice from the region and around the world, and has partnered with Bühler to create new production solutions that will benefit the industry.

ONE OF THE UNEXPECTED CONSEQUENCES of the Covid-19 pandemic has been a shift in the buying habits of rice consumers. Time at home offered the opportunity to experiment and develop cooking skills. This led to a move away from the quick-cook products designed to facilitate busy lives to using longer-cooking whole rice to achieve more complex culinary results.

Stefania Dolci is the Quality Assurance Manager for the Rice Division at Delica AG, a major supplier of own-brand goods to Migros, Switzerland's largest supermarket chain. A keen observer of the dynamic rice market, Dolci is responsible for the quality of the rice produced in one of the country's biggest rice mills, situated in Taverner, near the City of Lugano, in the Italian-speaking Swiss canton of Ticino. The canton is a rice growing region, where the sandy loamy wetlands on the northern shores of Lake Maggiore are used for the cultivation of risotto, an integral part of northern Italian culture.

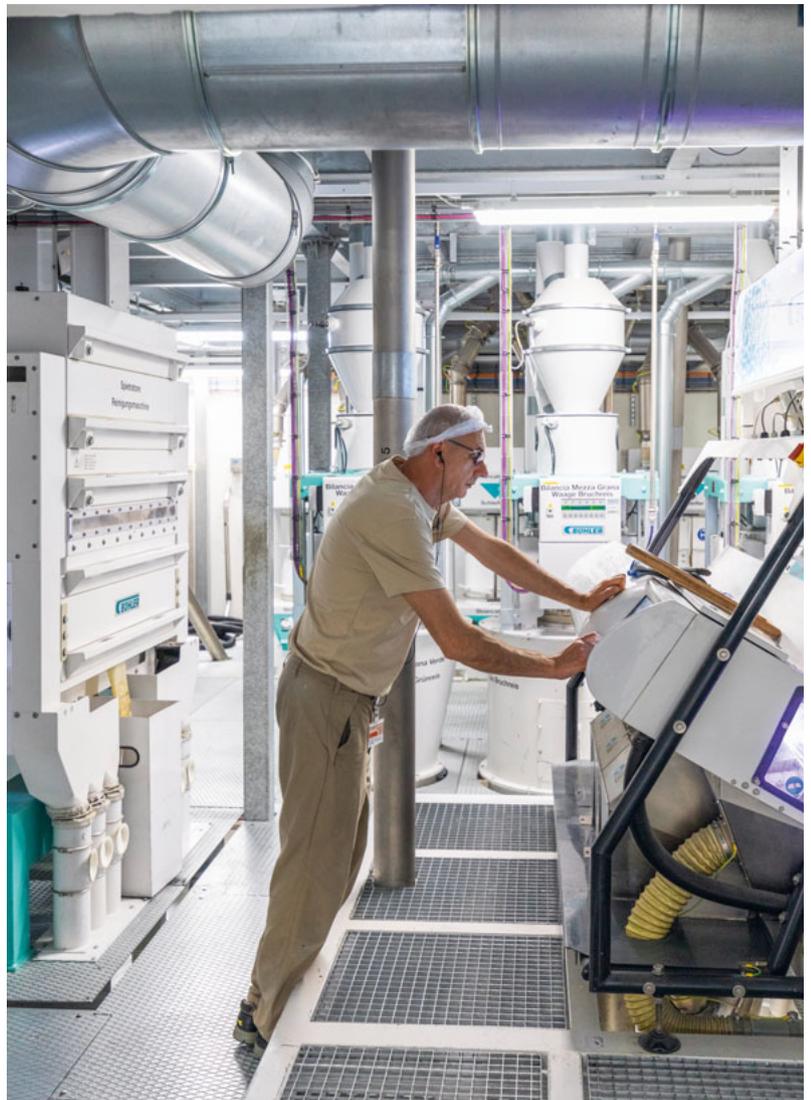
"There are so many trends at the moment," explains Dolci. "The lockdown during the pandemic changed things a lot with many people taking a liking to cooking. There are still those who want pre-cooked dehydrated quick-to-cook products, though. Another trend is sushi rice – it has become a popular thing with young people. Sustainability is also very important for customers, which is why it is so important we have the most modern rice mill. We can do many different things in the plant compared to the way we operated in the past."

A dynamic market means rice mills need to be flexible in what they produce. The Taverner rice mill, previously known as La Riseria, has belonged to the Migros organization since 1957 and merged into the Delica family of businesses in 2021. Bühler has had a long-standing relationship with La Riseria and in 2019 designed and built a new rice mill on the site of the old Taverner mill. It has since become a Bühler



Above: In this image you can see unpolished rice in the left hand, and polished rice in the right. Polishing makes the kernels smoother and shinier.

On the right is the Sortex S, which is connected to Bühler Insights. Optical sorting is the final processing step before packaging.



“SUSTAINABILITY IS VERY IMPORTANT FOR CUSTOMERS, WHICH IS WHY IT IS SO IMPORTANT WE HAVE THE MOST MODERN RICE MILL. WE CAN DO MANY DIFFERENT THINGS IN THE PLANT COMPARED TO THE WAY WE OPERATED IN THE PAST.”

STEFANIA DOLCI

Quality Assurance Manager, Rice Division at Delica AG



test bed for the most advanced digital technology in rice milling. The plant produces a wide range of different rice, from risotto to jasmine, basmati, and colored rice such as black Thai and red jasmine. “It is very important to us that the quality is always maintained over time. This is possible thanks to the recipes that have been set up in the Bühler production and refining line. This enables us to work with the same parameters every time for different recipes,” says Dolci.

Close collaboration for better outcomes

Cutting food waste is also a key goal at the Taverne mill. Any broken rice produced from refining is ground to make rice flour that is used in the food industry. Any discolored or broken grains rejected by Sortex, the Bühler optical rice sorter, are turned into a half grain mix that is used for animal feed.

“The Migros supermarket chain has been committed to sustainability for many years, which is why we use all waste by-products and reuse them

to add value,” explains Dolci. “There is almost no waste that is thrown away and almost no food waste. This is also very important for us. We are proud to be ISO 14001 certified. Of course, our other priority is quality – our products must always be healthy, safe, and taste good.”

Ensuring that all the different rice types produced at the Taverne mill are of the highest quality is where Bühler digital solutions excel. There are plenty of variables when milling rice. Unpredictable weather, regional characteristics, different rice types, and dynamic consumer trends all feed into a complex production matrix. The challenge is to fine-tune the milling process to guarantee the highest quality product every time.



“THIS IS THE MOST MODERN RICE MILL IN THE RICE MILLING INDUSTRY TO DATE, WITH SERVICE SYSTEMS IN PLACE TO ACHIEVE THREE MAIN GOALS: TO INCREASE YIELD, IMPROVE QUALITY, AND IMPROVE EFFICIENCY.”

MICHAEL HÄRTEIS
Product Manager for Automation & Digitalization at Bühler



VIDEO



Learn more about Delica AG and its innovative rice production in this video.

Over the years, a close relationship has developed between the Bühler and Taverne teams to help achieve this level of quality. Michael Härteis is the Product Manager for Automation & Digitalization at Bühler. His role is to coordinate and communicate all the research and development work being carried out by Bühler in the field of rice milling so that it can be taken to the production phase at the Taverne mill. “This requires very close collaboration with the customer, and I think we have found the right partner in Delica to better create and transfer our business ideas into final solutions for the rice market,” says Härteis. “This is the most modern rice mill in the rice milling industry to date, with service systems in place to achieve three main goals: to increase yield, improve quality, and improve efficiency.”

Sensors and data are at the heart of the Bühler digital processing service, designed to achieve these three goals. At the Taverne mill, the digital factory automation system, the Bühler Mercury MES (Manufacturing Execution System) uses sensor technology to control all the different production aspects of the plant from raw material storage to processing and final product storage.

The plant automation system enables the rice mill operators to run different product lines for up to five different rice types in any one week. Each rice type requires a different processing recipe and machine reset to provide optimum quality. The plant can be operated from multiple control panels where each production stage is graphically illustrated.

While Mercury MES controls the mill, Bühler Insights, a central platform that connects products and services, acts as the nerve center of the digital process, collecting and analyzing production data gathered by the sensors located throughout the production process. As data is collected, complex algorithms go to work calculating the best production parameters that should be applied depending on rice varieties.

Setting a new quality standard

When it comes to increasing yield, sensors fitted next to the Bühler Sortex S UltraVision optical rice sorter act as a final quality check for impurities and color deficiencies. Data picked up from these sensors is then analyzed and used to adjust, in real-time, processing parameters earlier in the production process to ensure yield targets are optimized. The Rice Quality Monitoring Service and its sensors are key to improving quality. It continuously measures the whiteness, shine, and smoothness of each grain of rice. Härteis believes it is one of the most exciting developments in the new Bühler rice milling digital portfolio. Grain whiteness has long been used as a



“BÜHLER IS THE PARTNER WE HAVE CHOSEN TO JOIN US ON THIS JOURNEY IN RICE REFINING AND PROCESSING. BY WORKING TOGETHER AND COLLABORATING, WE ARE IMPROVING THE PRODUCT AND THE SYSTEMS WE USE TO PRODUCE IT EVERY DAY.”

STEFANIA DOLCI

Quality Assurance Manager, Rice Division at Delica AG

quality parameter in rice milling. This service is also able, for the first time, to provide tangible and therefore measurable criteria for smoothness and shine, creating potential new industry quality standards.

Innovation drives efficiency

“Smoothness has always been assessed on the basis of how it feels in the hand, and shine has been based on how it appears to the eye. With the Rice Quality Monitoring Service we are able to make these qualities measurable and so we are creating a new industry benchmark giving our customers the opportunity to have two new certifiable quality standards,” Härteis explains.

Sensors allied to real-time data analytics means the old sampling process, involving rice being taken from the production line to a laboratory for analysis, can now be complemented with real-time quality controls. While laboratory analysis is still required

to meet food auditing requirements, real-time controls mean avoiding costly time delays in discovering a quality breach. “We also have another digital solution, which is Bühler Replay,” explains Dolci. “This is where we can go back in time and see what happened at a certain moment in the plant, which is useful both in case there was an alarm in some machine or even when there was a production error where some rice was wrongly mixed. We can go and see what was activated and at what time, and we can learn from this error and train our operators so that this problem doesn’t happen again.” Replay is also used to enable the Bühler and Delica teams to work together and analyze past production parameters to see where improvements can be made.

The new digital services are designed to improve quality and yield, along with the third goal of the digital journey – to improve efficiency. As production data is continually generated it also provides insights



Two years ago, the whole Delica mill underwent a retrofit of its control system from WinCos to Mercury MES. Mercury MES is the backbone of the mill as it enables digitalization and integrates all processes to increase efficiency and traceability.

These devices in the control cabinet of the mill collect signals from sensors and devices in the plant and feed them into the automation system.



into the production process that act as a sounding board for Bühler and Delica to partner in creating new production solutions that may have not yet been thought of. “It’s not just about gathering data, it is about being able to put that data into context. By adding it to the existing data from the plant automation system we are able to create new solutions,” explains Härteis. “It is through collaboration and our partnership that we are able to discuss our internal findings and our analytics to really see if we can improve daily operations for Delica. Without this close collaboration it would not be possible to test ideas, get customer feedback, and then further scale solutions to introduce new ideas to the market for the benefit of the global rice milling industry.”

One example of this process is the Bühler Sortex Monitoring Service, which started out as a prototype in the Taverne mill and is now a scalable solution being made available to the rice milling industry.

Smart machinery for optimum performance

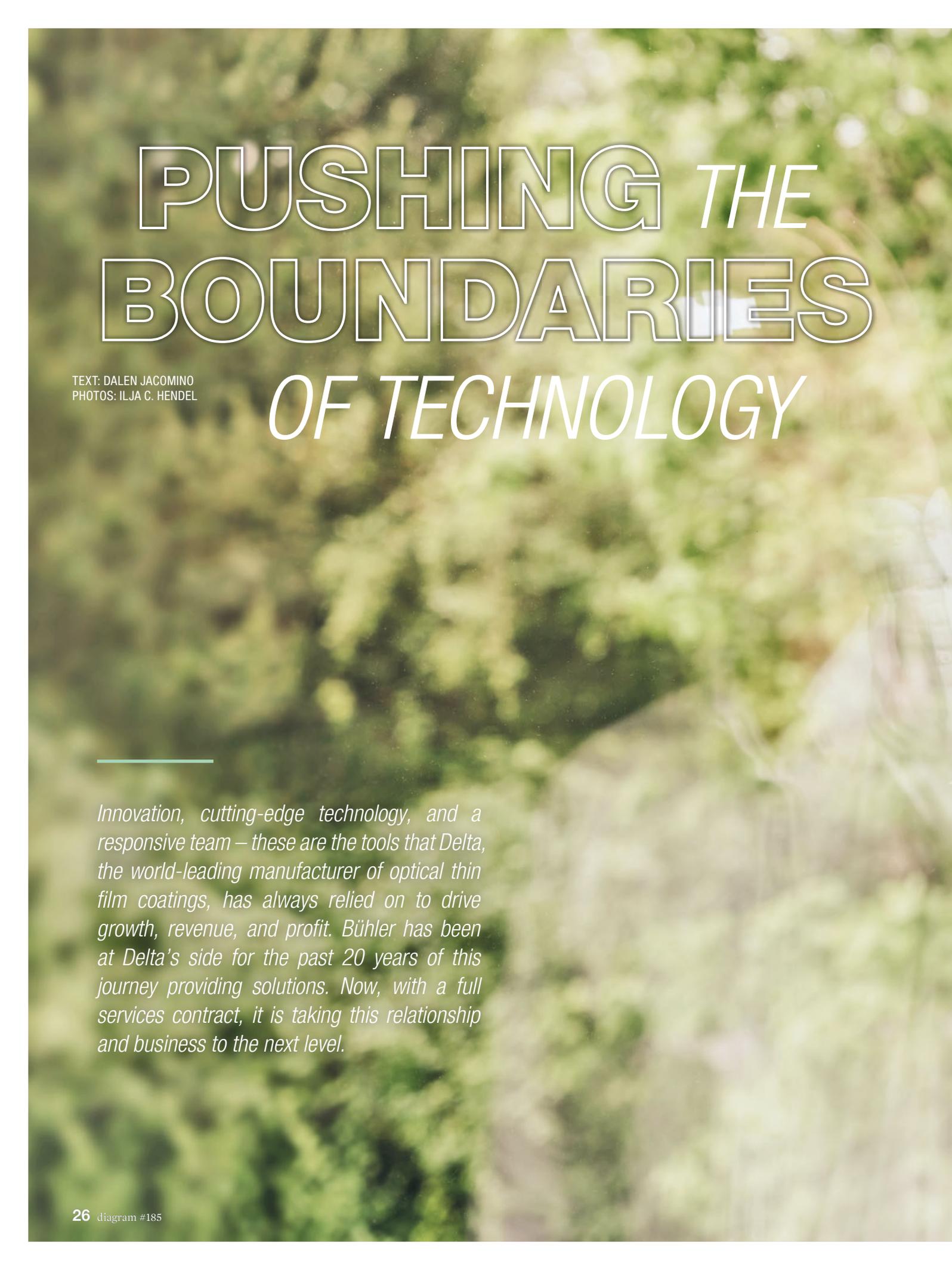
Another component of improved efficiency is the use of sensors to monitor machine performance, to predict maintenance, and to understand how machine settings relate to product quality. One example is the use of grinding wheels to whiten rice grains. Rice grain, especially long rice, is fragile with breakages linked to temperatures while milling.

During the whitening process, the outer bran layer of rice is scratched against abrasive grinding wheels. Maintaining a lower temperature inside the

milling chamber is vital to minimize these rice breakages. “As part of our smart milling concept, we use sensors to monitor heat generation inside the milling chamber and, based on this data, other machine parameters such as aspiration are adjusted to ensure optimum performance and minimize breakage,” Härteis explains. Sensors are also used to monitor machine performance to predict and avoid unplanned downtimes.

Like many food industries, rice milling suffers a high staff turnover, which often risks companies losing technical knowledge and experience. By digitalizing the production process companies become less vulnerable to losing an experienced rice miller who in the past would have been critical to running a productive mill.

The relationship forged between Bühler and Delica through the creation of the pioneering digital rice mill at Taverne is set to improve yield, quality, and operating efficiency across the rice milling industry. Digital solutions being tested and scaled up at the mill are enabling Bühler to prioritize which solutions have the greatest impact and are of the most benefit to the wider industry. “Bühler is the partner we have chosen to join us on this journey in rice refining and processing. By working together and collaborating we are improving the product and the systems we use to produce it every day,” says Dolci. “At the moment I could not imagine a more modern plant with more digital solutions than the one we have.”



PUSHING *THE* BOUNDARIES *OF TECHNOLOGY*

TEXT: DALEN JACOMINO
PHOTOS: ILJA C. HENDEL

Innovation, cutting-edge technology, and a responsive team – these are the tools that Delta, the world-leading manufacturer of optical thin film coatings, has always relied on to drive growth, revenue, and profit. Bühler has been at Delta’s side for the past 20 years of this journey providing solutions. Now, with a full services contract, it is taking this relationship and business to the next level.



THE DANISH COMPANY DELTA is a pioneer in the high-performance optical thin film coating industry and has been supplying global original equipment manufacturers (OEM) since the early 1970s. Over recent years, the business has grown significantly, doubling its revenue every five years and achieving an average annual profit of 10 percent (before taxes).

Even during challenging Covid-19 times, while many companies struggled to keep going, Delta remained on its growth path. Thanks to its innovation culture, cutting-edge technology, and responsive team, the organization was able to quickly develop several sets of fluorescence filters that were used in a Covid-19 quick test, among others, by the company Qlife.

Bühler has accompanied Delta on this innovation journey not only by providing solutions and high-performing equipment but by delivering a full package of services that help the company to get the best out of the machines.

The collaboration between Bühler Leybold Optics and Delta Optical Thin Film A/S dates back to 2002 when Delta bought an Advanced Plasma Source (APS) coater from Leybold Optics. This was the first step in what became a strong and long-lasting relationship. Over these 20 years, Delta, in collaboration with Bühler Leybold Optics, navigated business challenges, developed and manufactured new products, and has been achieving sustainable growth. More recently, as part of this fruitful exchange, Delta opted for Bühler's Total Care service contract, taking the relationship and business to the next level.

High-tech solutions in everyday life

Delta relies on several Leybold Optics solutions at its headquarters in Hørsholm, a municipality located about 25 kilometers north of Copenhagen, Denmark, including the SyrusPro 1100 precision coater and the HELIOS 800 sputter coater. Supported by these solutions and Bühler's expertise, the company develops and manufactures a wide variety of custom optical filters, which includes continuously variable filters, fluorescence filter sets, bandpass filters, short and long wave pass filters, and smart coatings in the ultraviolet, visible, near-infrared (UVA/VIS/NIR) range, among others. Delta serves global instrument manufacturers such as Leica, Zeiss, and Avantes.

Its solutions may sound highly technical, but they are embedded in a wide variety of applications and products in everyday life. Optical thin filters, for example, have been an enabler in modern medical diagnosis and drug discovery, detecting cancer, tuberculosis, and Covid-19, to name a few.

Optical filters are also used in hyperspectral imaging, which is used to track changes in the environment, for example, to understand surface CO₂

emissions, map hydrological formations, and track pollution levels. In fact, thin-film optical filters are produced by adding thin layers of materials with special optical properties onto a substrate, such as optical-grade glass. As light makes its way through the optical filter, its direction changes as it passes from one layer to the next, resulting in internal interference. The filters can be designed to transmit, block, or reflect light at any wavelength range from ultraviolet (UV) to infrared radiation (IR).

Delta's thin-film optical filters are also present in point of care (PoC) devices, which are used to obtain diagnostic results while next to the patient – in other words, for checks that are not done in the laboratory. They can be used in doctors' offices, hospitals, and in patients' homes, and can be applied on many sorts of medical tests.

A new test for Covid-19

One of the latest innovations from Delta was applied in just this type of device. During the challenging first months of Covid-19, Danish medical device producer Qlife decided to develop a test for SARS-CoV-2, which would then be integrated into its diagnosis platform (PoC) Ego. The company was very quick in the research and development process. The teams modified the transportable analysis instrument of an already existing system so that it could produce a full PCR test for SARS-CoV-2 in about 20 minutes. The optical thin filters, developed and produced by Delta, were an essential part of the Qlife solution, since they would determine whether SARS-CoV-2 was present in the sample.

Qlife contacted Delta, who was already delivering fluorescent microscopes to Qlife's Ego. PoC instrumentation requires very small, yet high-performing custom optical filters in large quantities and at low prices. The organizations joined forces and embarked on a journey to quickly develop the filters. Within 10 days, the teams developed, tested, and started to produce the filters for the Ego testing device. "With our coating technology that has been in development since the 1970s, we were able to let a single wavelength through, while we dim others by a factor of between 100,000 and a million times," explained the company's Chief Technology Officer, Henrik Fabricius, in an article published in 2020 in "Ingeniøren" [The Engineer], the Danish weekly newspaper.

According to experts, the art of producing optical filters has to do with the capacity of adding hundreds of layers with different refractive indices, all with extreme precision. The light filtering function is triggered in the event of interference between the inter-reflected light waves. In Qlife's case, three different filters had to be used, and the team succeeded in getting them all right on the first attempt.





Henrik Fabricius, Chief Technology Officer at Delta, Poul Svensgaard, CEO at Delta, and Robin Fischer, Team Leader Technologists for Projects at Bühler Leybold Optics work together to drive the company into the future.

“WE HAVE A VERY STRONG TRACK RECORD IN SUPPLYING HIGH VOLUMES OF ADVANCED FILTERS.

OUR CHOICE OF TECHNOLOGY HAS ALSO PROVED TO BE SCALABLE.”

POUL SVENSGAARD
CEO of Delta Optical Thin Film



Thereafter, the filters had to be cut out so that they could fit into small devices, like the Ego. The filters only measure 4x4 square millimeters, but Delta can manufacture filters that are even smaller.

“The pandemic clearly created a huge demand for advanced bandpass filters. By then, we had just acquired a new Bühler HELIOS 800 Sputter Coater machine and had had good support from Bühler’s team to get the machine commissioned and in volume production within a few months. This allowed us to supply a number of new customers with advanced filters for the PCR [polymerase chain reaction] platforms,” said Poul Svensgaard, CEO of Delta Optical Thin Film.

Strong research tradition

Such a quick reaction was also possible thanks to the solid research and innovation culture at Delta. The company, which currently employs 25 people, has a strong theoretical and methodological foundation that keeps them pushing the limits of optical filter technology. Delta, as it is known today, is the result of a management buyout undertaken by CEO Poul Svensgaard and CTO Henrik Fabricius in 2014. This innovation-driven approach had already gained

them attention and recognition in the 1960s, when thin-film scientists at the Danish Laboratory for Technical Optics recommended that customers Carl Zeiss and Leica, in Germany, exchange their colored glass filters for thin-film interference filters to improve their fluorescence microscope’s performance. Zeiss and other customers took and appreciated the advice, which led to an increased demand for custom optical thin-film filters.

Two decades later, the new technique for automated deposition of advanced optical coatings was helping manufacturers of analytical instruments increase their standards. The company kept on its development journey, gaining respect and market share, and being recognized as one of the first to produce ultra-hard-coated optical filters.

In 1993, Light & Optics merged with other Danish institutes. This is when Delta was established. With that move, the company started to focus on the commercial opportunities of this business and prioritized the implementation of measures that would increase the competitiveness of the thin-film business internationally. That strategy gained force with the buyout in 2014 – and that is when Delta was able to move ahead with its ambitious growth plan.

The pandemic created a huge demand for advanced bandpass filters. By then, Delta had just acquired a new Bühler HELIOS 800 Sputter Coater machine and with Bühler’s team support was able to increase production within a few months.





“WITH OUR COATING TECHNOLOGY THAT HAS BEEN IN DEVELOPMENT SINCE THE 1970s, WE WERE ABLE TO LET A SINGLE WAVELENGTH THROUGH, WHILE WE DIM OTHERS BY A FACTOR OF BETWEEN 100,000 AND A MILLION TIMES.”

HENRIK FABRICIUS

Chief Technology Officer at Delta

In the past few years, Delta’s business has grown significantly. “We roughly double our revenue every 5 years,” said Svensgaard. “We invest our profits 100 percent in sustainable growth and in new technologies to the benefit of our customers.”

With that level of performance, the management of the company had to ensure that there was enough space and infrastructure to support the ongoing growth journey. In 2019, Delta’s management decided to invest in a new factory. And in Autumn 2020, the teams celebrated the opening of the new 2,300 square meter facility located at the DTU Science Park in Hørsholm, Denmark, which is administratively part of the Technical University of Denmark (DTU) and brings together more than 300 companies and over 4,500 scientists, entrepreneurs, business developers, and employees. The new Delta building has laboratories, clean rooms, offices, a

cafeteria, and meeting rooms. That kind of growth through innovation approach is only possible with expertise, curiosity, teamwork, and going the extra mile to address the customer’s needs. These are some of the values that are the foundation of Delta. The company has a flat hierarchy and an open-door policy, valuing the contribution and ideas of the team, offering flexible working hours, and the chance for employees to define their own working day freely.

But it does not stop there. Behind that powerful combination there is also a team of professionals next to Delta, supporting the organization through the challenges, ensuring that the equipment and operations can run smoothly. “Our work is to ensure quality, reliability, and mass production capabilities. We deliver that with our Total Care portfolio of services,” explains Robin Fischer, Team Leader

Optical thin filters have been an enabler in modern medical diagnosis and drug discovery, detecting cancer, tuberculosis, and Covid-19, to name a few.



You can find out more about our **HELIOS** technology on our website.

Delta, which employs 25 people, has a strong theoretical and methodological foundation that keeps the company pushing the limits of optical filter technology.



You can find out more about the **Total Care** service package on our website.



Thin-film optical filters are produced by adding thin layers of material with special optical properties onto a substrate, such as optical-grade glass.



VIDEO



Learn more about Delta Optical Thin Film.



“TOGETHER WITH DELTA, WE ANALYZED THEIR PLANT CONDITIONS, AND DISCUSSED THEIR NEEDS AND GOALS. BY CUSTOMIZING A CONCEPT, WE COLLABORATE TO GET THE BEST OUT OF THE MACHINES.”

ROBIN FISCHER

Team Leader Technologists for Projects at Bühler Leybold Optics



A Delta team member controls the quality of the optical thin film before it are delivered to the customer.

Technologists for Projects at Bühler Leybold Optics. “Together with Delta, we analyzed their plant conditions, and discussed their needs and goals. By customizing a concept, we collaborate to get the best out of the machines.”

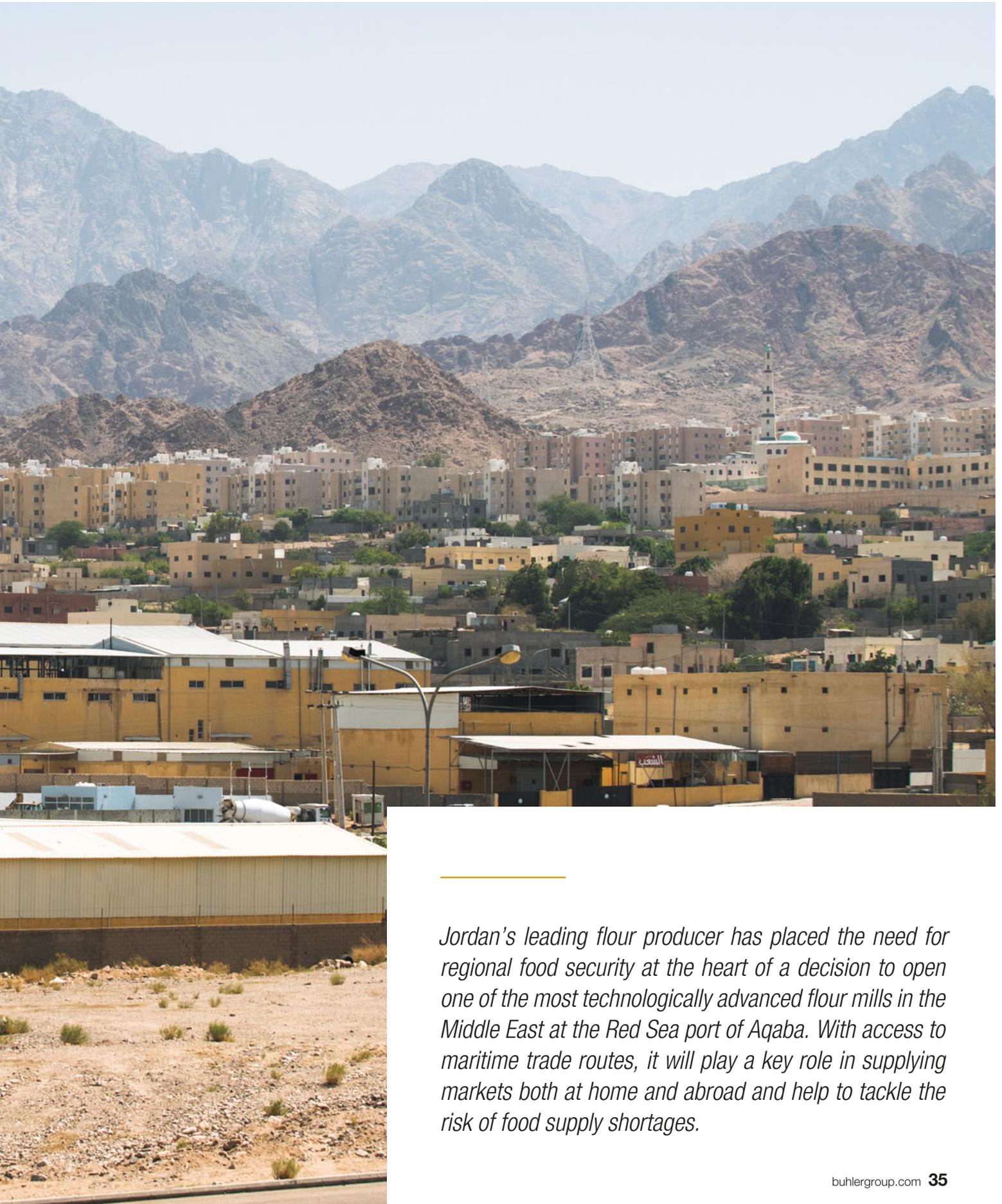
It sounds simple and obvious, but it is not, in particular if one considers the incredible number of challenges that businesses are facing currently, from supply chain shortages, geopolitical tensions, and climate change impacts to risks of infectious diseases. Having a team ready to support the company’s operations while it sees its demand grow or when it faces an operational or technical issue with the equipment can make all the difference.

By building and fostering trusting relationships with suppliers, customers, and the market, Delta wants to go forward into the future. “We already serve a truly global set of customers. We have a very strong track record in supplying high volumes of advanced filters. Our choice of technology has also proved to be scalable. This is noticed in the market to a level where we must sometimes turn down new business,” says Svensgaard. “No doubt we will grow, but our challenge is not to grow our organization too fast. We do not want to compromise on quality.”

DIGITAL MILESTONE
IMPROVES

JORDAN'S FOOD SECURITY

TEXT: STUART SPEAR
PHOTOS: MOHAMMAD DARWEISH



Jordan's leading flour producer has placed the need for regional food security at the heart of a decision to open one of the most technologically advanced flour mills in the Middle East at the Red Sea port of Aqaba. With access to maritime trade routes, it will play a key role in supplying markets both at home and abroad and help to tackle the risk of food supply shortages.

IN EARLY 2021, the family-run Al-Hazaa Investment Group, based in the Jordanian capital of Amman, commissioned Bühler to design, build, and equip the region's most advanced flour mill in the southern city of Aqaba. Eighteen months later, the mill near the Red Sea opened. Reviving Aqaba's historical name, Ayla, Al-Hazaa Investment Group dubbed the new business: Ayla Mill.

It opened for business on July 4, 2022, equipped with the latest Bühler digital technologies. The decision to build the mill in Aqaba was taken to improve the Kingdom's food security. The Red Sea port provides Jordan's only access to maritime trade routes and acts as the main conduit for grain entering the Kingdom of Jordan and for exported flour products. "As the world is heating up, causing bad harvesting seasons, scarcity of crops, and instability in grains supply chains, we find ourselves confronted with an increased risk of a food supply shortage," explains Ibrahim Al Hazaa, Director Manager of the Al-Hazaa Investment Group and the Project Manager of the Ayla Mill. "The milling sector is one of the most crucial industries when it comes to food security, which is why we as the Al-Hazaa family have devoted ourselves, through our latest investment, to enhancing the food security and safety of the local community by opening a state-of-the-art flour mill in Aqaba."

Before the plant began production in July, grain had to be transported 300 kilometers from Aqaba to Amman for processing into flour before being transported back to the city of Aqaba, the southern region

of Jordan and the port for export. Jordan imports 95 percent of its grain, most of it from Romania, traveling from eastern Europe through the Suez Canal and up through the Red Sea. Ninety percent of flour processed in Jordan is supplied to local markets with 10 percent exported to Yemen, Syria, and the Horn of Africa, along with other countries.

Jordan's dependency on imported grain has resulted in a long-recognized need to build up its storage capacity to protect against potential disruptions to the global grain market. According to the latest figures, storage capacity stands at 1.388 million metric tons. The Aqaba plant adds to the Kingdom's resilience by increasing this, while also reducing the need to transport grain for processing.

Storage is, however, only one part of the story. Milling efficiency is also a key factor. Al Hazaa believes that the use of Bühler digital technologies at the Ayla Mill has the potential to transform milling efficiency across the entire milling operation of the Al-Hazaa Group. "The opening of the Ayla Mill is the first time that digital services such as Bühler Insights have been used in one of our milling plants and I would describe it as a milestone moment that provides an opportunity to adapt the technological advances to suit the unique Middle East milling market," explains Ibrahim Al Hazaa.

The Al-Hazaa Investment Group was launched in 1942 when the company founder, Sharif Al Hazaa, opened his first flour mill. The next two generations of the family went on to open more mills in Iraq,

The Ayla Mill can produce 240 tons per day and has two wheat storage silos with a capacity of 10,000 tons.





Cyrill Stutz and Ibrahim Al Hazaa walk by the flour collecting conveyor inside Ayla Mill to check the milling process.



“THE MILLING SECTOR IS ONE OF THE MOST CRUCIAL INDUSTRIES WHEN IT COMES TO FOOD SECURITY, WHICH IS WHY WE HAVE DEVOTED OURSELVES TO ENHANCING FOOD SECURITY.”

IBRAHIM AL HAZAA

Director Manager of the Al-Hazaa Investment Group

Jordan, Egypt, and the United Arab Emirates with the first Jordanian mill opening in 1998 in Amman. Today, the company is active throughout the grain value chain from silo grain storage to flour milling, animal feed, and the production of pasta and Asian noodles. Al-Hazaa Group is the largest milling operator in Jordan with 70 percent of the market. The company also operates a photovoltaic plant producing 36 million kWh of solar power annually, enough to sustainably power all its operations in Jordan.

“I am a member of the third generation of the Al-Hazaa Investment Group to be collaborating with Bühler and this relationship has produced many successful investments in different sectors in the Middle East,” says Ibrahim Al Hazaa. “Bühler has

shown great support and help since the first day we started negotiating this mill, starting with the design of the mill flow sheet and layout, choosing the most suitable machines through to the commissioning and operating of the mill.”

Built for flexibility

One of the first challenges when designing the new plant was to fully understand the unique characteristics of the Jordanian flour market. Unlike mills built in countries with local wheat production where grain supplies are more secure, the Ayla Mill was designed to be able to process a far greater variety of grains coming from sources as diverse as eastern Europe, Australia, Romania, Canada, or the US. This means being able to clean a wider range of grain types and sizes along with the ability to create consistent and optimal grist from different raw materials for each of the product lines.



“WE HAVE CORPORATE SOCIAL RESPONSIBILITY AS ONE OF OUR CORE VALUES, WHICH IS WHY THE GROUP DECIDED IN 2017 TO TAKE SERIOUS STEPS TO UTILIZE MORE GREEN ENERGY SOURCES AND REDUCE OUR CARBON FOOTPRINT.”

MARIAM AL HAZAA

Assistant Development Manager at the Al-Hazaa Investment Group

Maintaining optimal grain moisture is an additional challenge in a climate where a high degree of processing flexibility is needed to tackle extreme differences in summer and winter temperatures. The second challenge in designing the Ayla Mill was to create built-in versatility to ensure it can quickly adapt to a very dynamic Middle Eastern market. An example of a recent market shift has been the popularity of pasta due to a generational change in eating habits as well as pasta being seen as a cheaper staple food source compared to rice. Pasta is now well established in the market while Asian noodles, requiring a different flour, are starting to make inroads as a relatively new food source.

“When you develop a mill, you need to keep in mind your market and the Ayla Mill has the widest range of products from white pastry flour to whole grain, bakery flour and Arabian bread flour, pizza flour, pasta, and Asian noodles,” explains Ibrahim Al Hazaa. “What makes the Al-Hazaa mills so unique is our ability to provide such different types of flour to our customers.”

Given the range of products being produced at the Ayla Mill, another key feature of the production process is the ability to control protein levels for different product lines. This involves a complex blending process of different wheat to control the protein content to get the optimum gluten level needed for a noodle flour compared to a pasta or a bread flour. The mill is also equipped with semolina extraction and packing machinery. It is these challenging and varied production demands that have led to Al-Hazaa Investment Group developing one of the world’s most sophisticated quality assurance laboratories based in south Amman. It is capable of carrying out sophisticated measurements of gluten

performance, water absorption, gas production, and gas retention, along with the creation of a new baking test center focused on the unique demands of product innovation in the Middle East.

Meeting unique challenges

The Ayla Mill has a storage capacity of 10,000 tons of wheat and the ability to process 240 tons of grains each day. The plant is also fitted with data points throughout the production process feeding data to Mercury MES, Bühler’s Manufacturing Execution System, which integrates all processes to enable control over every stage of production. Data is then fed to Bühler Insights, a platform for connecting products and services to optimize plant efficiency, where algorithms compare past and present production parameters to ensure optimum efficiency. One of the key benefits for Al-Hazaa is the ability to monitor mill performance and yield remotely and in real time.

“Despite the distance between the Ayla flour mill in Aqaba and my office in Amman, I am able to review my plant’s productivity using one of Bühler’s newest digital platforms, Bühler Insights, with a customized dashboard displaying the most important KPIs,” explains Ibrahim Al Hazaa. “Bühler Insights is also helping to optimize my plant efficiency, reducing energy consumption, maintenance time, and waste.”

The Al-Hazaa Investment Group plans to fit Bühler Insights and Mercury MES to each of its other Jordanian mills by the end of 2023. Production data is also monitored by Bühler to help improve production efficiencies, and a Bühler team is working with the Al-Hazaa Investment Group to see how best to utilize all the production data being generated by the plant.

“With our solutions and technologies, we wanted to help Al-Hazaa increase performance and enable them to extract flour of different grades, from white flour to dark and whole grain flour,” explains Cyrill Stutz, Bühler Head Miller at Ayla Mill. “The Red Sea flour mill will also be producing pollard and bran for human consumption as well as animal nutrition. The high-performance machines installed in the mill cater to a wide range of needs with its cleaning facilities appropriate for wheat from different sources and the ability to produce a wide range of flour from low ash flour 0 to high ash flour 3.” Other digital services used in the Ayla Mill include Overall Equipment Effectiveness, Yield Management Service, and Error and Downtime Analysis.

By producing sufficient solar energy to run all of its processing plants in Jordan, Al-Hazaa Group has been able to cut its carbon footprint by 12,000 to 13,000 tons a year and protect the business against rising energy costs. “We have corporate social responsibility as one of our core values, which is why the group decided in 2017 to take serious steps to utilize more green energy sources and reduce our carbon footprint,” says Mariam Al Hazaa, Assistant Development Manager at the Al-Hazaa Investment

Group. “This is why we established the Al-Hazaa Company for Renewable Energy in 2017, which is the biggest private use solar plant in Jordan, as well as the first company to obtain licenses to generate renewable energy for self-consumption.”

Focusing on food security

Jordan’s decision to focus on food security has meant the Kingdom has been relatively unscathed by the global grain supply disruption caused by the Ukraine conflict. Investment in grain storage capacity meant Jordan’s General Company for Silos and Supply was able to announce there was enough grain stored for supplies to last 15 months when Russia invaded Ukraine in February 2022.

The Al-Hazaa Investment Group is contributing to the nation’s food security resilience by providing one of Jordan’s largest private grain silos, with the capacity to store 100,000 tons of grain. Thanks to the high storage capacity, secure Romanian wheat supplies, and the government regulated pricing of wheat, Jordan has been able to maintain grain supplies during one of the most seismic disruptions to the global grain market in recent history.

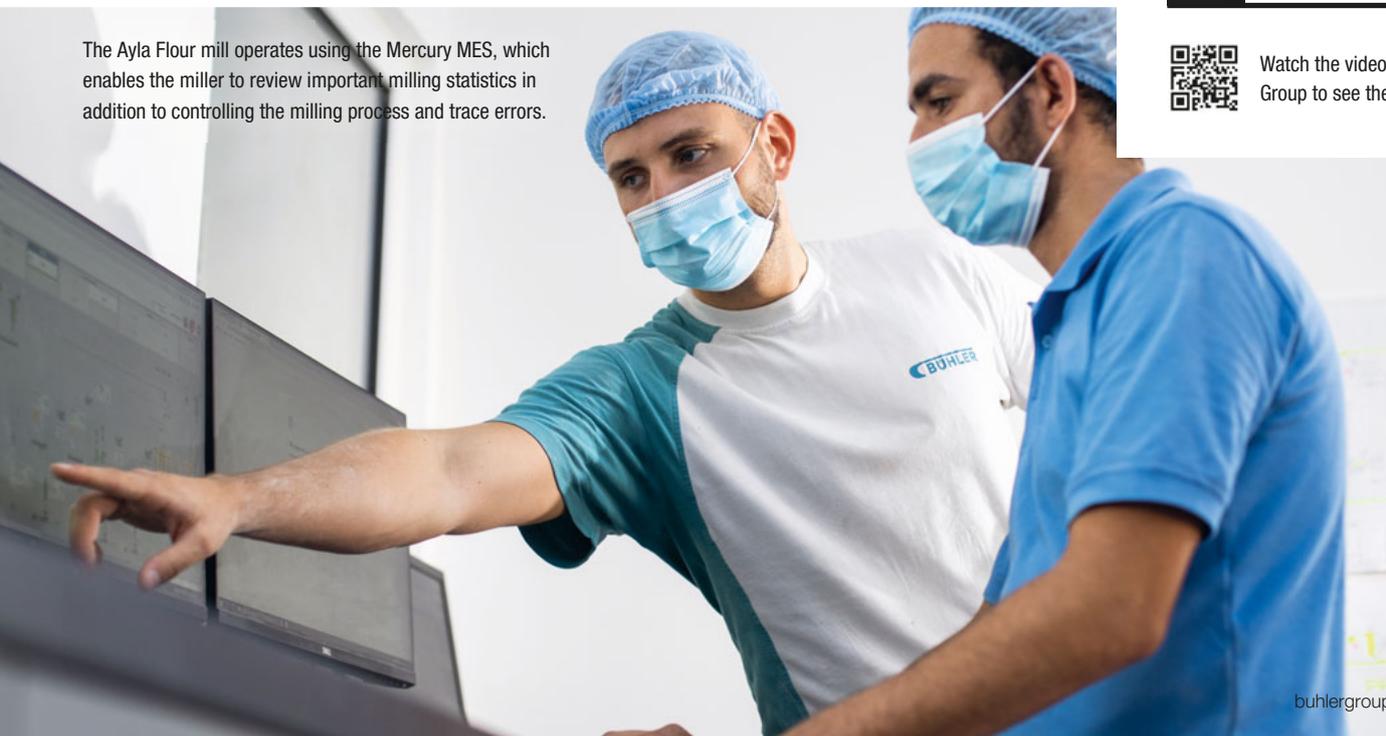
“Al-Hazaa cherishes the local community, as we are committed to contributing to the welfare of our people,” says Ibrahim Al Hazaa. “Among the company’s core values lies a need to take social responsibility and to act as leaders and role models for everyone in the challenging times that lie ahead of us. To do just that, we have taken the vital step of opening our new, state-of-the-art mill in Aqaba, and by doing so, are setting a new regional standard.”

The Ayla Flour mill operates using the Mercury MES, which enables the miller to review important milling statistics in addition to controlling the milling process and trace errors.

VIDEO



Watch the video about Al-Hazaa Group to see the plant in action.





TEXT: STUART SPEAR

ACCELERATING **IMPACT** TOGETHER

In June, a thousand representatives of businesses in the fields of food, mobility, and animal nutrition gathered in Uzwil, Switzerland to discuss how innovation, technology, collaboration, and education can address the challenges of climate change, biodiversity loss, and wealth inequality. The scale and makeup of the Bühler Networking Days event has created a potent force to help accelerate impact towards a more sustainable future.



During the Networking Days there were many opportunities for direct exchange about various approaches to solutions.

THE BÜHLER NETWORKING DAYS 2022 took place against a backdrop of growing climate crisis as temperatures in many places around the world soared to unusual levels. The event’s focus was a call for immediate joint action, at scale, across a range of issues. On June 27 and 28, leading academics, business leaders, entrepreneurs, and innovators argued for the urgent need to improve energy and food security, reduce waste, cut water usage, lower CO₂ emissions, improve biodiversity, rethink mobility, and close the gap on wealth distribution.

As the event made clear, we have the tools to address these challenges. Through technology, innovation, and education we can create a more sustainable future for all. What is needed now to realize this potential is even greater collaboration across sectors and industries – and this was the driving purpose behind the Networking Days.

The first illustration of the power of collaboration was the size and make-up of the event itself. Guests had traveled from 95 countries, and between them represented companies that feed 4 billion people and provide mobility for 2 billion people.

Opening the conference, Bühler Group CEO Stefan Scheiber described how vaccine research, advances in digitalization, and the development of communication at scale during the Covid-19 pandemic showed the potential for businesses to address global challenges. “We have experienced the power of science and innovation with industries collaborating at a new scale,” said Scheiber. “In our industries – in animal nutrition, food, and mobility

“TOGETHER, WE CAN, AND WE WILL, CREATE A BETTER, MORE SUSTAINABLE, AND FAIRER WORLD FOR FUTURE GENERATIONS.”

STEFAN SCHEIBER
CEO Bühler Group

– the innovation rate has never been as high as it is now, which creates impact because we need new technologies and widespread collaboration to tackle new challenges, and at the same time secure the future of our businesses in a responsible way. We need technologies, we need collaboration, and we need responsible leadership to shape the future.”

Impact through purpose

But for collaboration to work businesses need clarity of purpose. Ranjay Gulati, Harvard Professor of Business Administration, and author of “Deep Purpose: The Heart and Soul of High-Performance Companies”, warned that business leaders should not get too distracted by the complex metrics surrounding environmental, social, and corporate social responsibility. He said that companies are far more likely to achieve social impact if they have a clearly articulated purpose. “The first way in which purpose can accelerate impact is by providing direction,”

For Pier Luigi Sigismondi, President of Dole Sunshine Company, it is clear that his company must meet social objectives.

**“PURPOSE CREATES A COMPASS
AND AN ORIENTED FRAMEWORK
AROUND WHERE YOU ARE GOING
IN TURBULENT TIMES.”**

RANJAY GULATI

Harvard Professor of Business Administration and author of “Deep Purpose: The Heart and Soul of High-Performance Companies”



Watch the video interview with Sigismondi to find out how a sustainability strategy can be maintained even in difficult times.



Watch the video interview with Prof. Gulati to learn why companies must find their deep purpose to achieve long-term success.



explained Gulati. “Purpose creates a compass and an oriented framework around where you are going in turbulent times when you have lots of things going on around you.” The professor added that focusing on social purpose also motivates and inspires employees, while a clearly expressed business motivation often provides useful clarity and orientation for business partners.

In his book on deep purpose, Gulati cites Bühler as an example of a company that has successfully adopted this approach. Bühler’s target is to have solutions ready to multiply that reduce energy, waste, and water by 50 percent in the value chains of its customers by 2025. Professor Gulati explained that once a social purpose is decided on, it must be properly explained to all stakeholders both internally and externally, so that it becomes part of the corporate DNA and is expressed through all company actions.

Dole Sunshine Company, the agricultural multinational corporation formed in 1851, has also adopted Professor Gulati’s approach. Company President Pier Luigi Sigismondi told the Networking Days audience that his company’s social purpose is to create “a more equitable world where everyone, irrespective of their age, race, income, location, or gender, has the right to nutrition that comes from the goodness of the earth”.

Sigismondi explained how Dole Sunshine Company had arrived at the decision to frame a social purpose: “At Dole, we have emerged from 30 years of being focused on short-termism and thinking that our only responsibility was to deliver profit,” said Sigismondi. “In the Covid-19 crisis we asked ourselves, what can we do to drive our business with success and with purpose in a way that we can live with our conscience and that is meaningful for all of us?”

A difficult journey

In the past couple of years, Dole has partnered with NGOs, businesses, and start-ups to achieve its goals. Initiatives include a target to remove fossil-based plastics from packaging by 2025, turning fruit waste into fibers to create fashion products, improving accessibility to nutritious fruit-based snacks for children, and raising public health awareness by projecting malnutrition facts onto the sides of buildings and trash cans in New York, Los Angeles, and Baltimore.

**“HOW MUCH DO WE UNDERSTAND
OUR SUPPLY CHAINS? I AM CONVINCED
THIS IS WHERE WE MUST COME
TOGETHER TO SHARE DATA AND TRACE
MATERIAL FLOWS.”**

BUHLER

CHRISTIAN KLEIN
CEO of SAP

NWD22



Satya Nadella answered
Stefan Scheiber's questions on the subject of
sustainable corporate governance.

**“TRUE LEADERS ALWAYS
BRING CLARITY AND MAKE
A CALL EVEN DURING
UNCERTAIN TIMES.”**

SATYA NADELLA
CEO of Microsoft

In a session exploring how good corporate leadership is essential for businesses wishing to accelerate social impact, Satya Nadella, CEO of Microsoft, outlined his approach to recruiting future business leaders. Nadella explained that he looks for three key attributes: an ability to generate energy, deliver results under constraints, and create clarity when none exists. “We live in a complex, uncertain world. There will always be ambiguity in our work, but true leaders always bring clarity and make a call even during uncertain times,” said Nadella.

Speaking in the same session, keynote speaker Christian Klein, CEO of SAP, the German multinational software corporation with over 400,000 customers globally, spoke of the need for leaders to thoroughly understand their industry and business, especially when it comes to complexity within supply chains.

“We are all on social media, sharing data all the time, and yet when it comes to businesses, how much do we understand our supply chains? I am convinced this is where we must come together to share data and trace material flows,” said Klein. “End-to-end traceability means you can think about how to measure demand in real time and adjust your inventory right down to the raw material.” He added that it is only by fully understanding your supply chain that it is possible to improve standards on issues such as Scope 3 emissions, which include emission hot spots in the supply chain.

In a session on the power of innovation to accelerate change, guests heard from three start-ups driving sustainability through high-tech advances in cellular agriculture, satellite monitoring of resto-

ration projects, and carbon removal. In a historic moment, Stephanie Michelsen, Co-Founder and Co-CEO of Jellatech, presented the first sample of sustainably grown cell-based collagen ever to be seen outside a laboratory. She uses a cutting-edge technology to produce a smarter, high-quality collagen and gelatin with cellular agriculture.

As key ingredients for the pharmaceutical, biomedical, and food industry, the market for collagen and gelatin is worth USD 8.4 billion annually and is currently solely reliant on animal by-products. To rapturous applause, Michelsen told attendees that cellular agriculture has the potential to eliminate all the environmental damage caused by rearing livestock. “Collagen and gelatin are just the starting point for us. There are so many other exciting proteins from animals and nature that we can now grow in a lab,” she said. Jellatech is currently fundraising to move the technology from laboratory scale to a pilot project and beyond.

Clara Rowe, CEO of Restor, a non-profit start-up that uses satellite imagery to monitor restoration projects globally, pointed to three statistics that outline the climate contribution potential of restoration. “Forest restoration alone is estimated to be able to prevent up to 60 percent of the species extinction



Watch the video interview about Eridia to discover how precision fermentation and cellular agriculture will become part of the solution for a sustainable food system.



The two Managing Directors, Claudia Neuhold and Erika Georget, announced the foundation of their joint venture Eridia.

“COLLAGEN AND GELATIN ARE JUST THE STARTING POINT FOR US. THERE ARE SO MANY OTHER EXCITING PROTEINS FROM ANIMALS AND NATURE THAT WE CAN NOW GROW IN A LAB.”

STEPHANIE MICHELSEN
Co-Founder and Co-CEO of Jellatech



“FOREST RESTORATION ALONE IS ESTIMATED TO BE ABLE TO SEQUESTER ABOUT 299 GIGATONS OF CARBON – THAT IS ABOUT 30 PERCENT OF THE CARBON THAT HAS ACCUMULATED IN THE ATMOSPHERE SINCE THE INDUSTRIAL REVOLUTION.”

CLARA ROWE
CEO of Restor



that is expected today, to improve food security for over a billion people around the world, and sequester about 299 gigatons of carbon – that is about 30 percent of the carbon that has accumulated in the atmosphere since the Industrial Revolution,” said Rowe. By providing greater transparency to restoration projects, Rowe argues Restor has the potential to build trust and accountability, inspiring additional investment.

Dr. Christoph Gebald, Co-Founder and Co-CEO of Climeworks, described how his company is removing CO₂ from the atmosphere and permanently storing it deep in the ground to help reverse climate change. Launched 13 years ago, Climeworks now operates the world’s largest plant, built in Iceland to capture atmospheric CO₂. “This technology is here to stay, and 30 years from now this industry will be very big. It will be removing CO₂ on a gigaton level from the atmosphere, and it will operate synergistically with other climate change technologies like solar and wind,” explained Gebald.

Leading by example

During Networking Days, Bühler announced how it planned to achieve its own climate change targets. Bühler is calculating the impact of its different processing solutions on waste, energy, and water consumption, land use and CO₂e footprint, which



Many partnerships were announced during the Networking Days event, including Endeco.

includes other greenhouse gases in addition to CO₂, such as methane and nitrous oxide. Bühler is also assessing how its technological advances impact on the United Nations Sustainable Development Goals and the benefits for circular economy. “By evaluating the impact of our solutions, we can then start tracking their overall accumulative impact,” said Bühler CTO Ian Roberts. Bühler is also using new technological solutions to track avoided CO₂e emissions. Roberts explained that Bühler is now able to provide a service by working with customers to quantify their CO₂e footprint. “We can do product assessments, look at where the processing hot spots are, build action plans to drop your CO₂e footprint, and have it externally certified,” he said.

Bühler also announced joint ventures and partnerships during the event aimed at securing reliable protein supplies to meet demand as the global population grows. Anticipating growth in the plant-based meat market, and as a market leader in the upstream processing of pulses, through partnerships and joint ventures, Bühler is building an ecosystem offering complete bean to burger solutions. A strategic partnership with the fine-grinding and air-classification specialist Hosokawa Alpine has resulted in the ability to engineer the dry extraction of protein from pulses with protein concentrations of around 50 to 60 percent.



“IN 30 YEARS FROM NOW THIS INDUSTRY WILL BE REMOVING CO₂ ON A GIGATON LEVEL FROM THE ATMOSPHERE.”

DR. CHRISTOPH GEBALD

Co-Founder and Co-CEO of Climeworks

Additional partnerships were announced with Endeco, a starch and protein plant design and construction specialist, Flottweg, a specialist in separation technology, and MMS, a provider of membrane solutions across the food and bio-pharma industries. The three new partners bring unique knowledge to complement Bühler’s processing solutions in the field of plant-based protein extraction.

Addressing inequality

While climate change is seen as one of the biggest challenges of our age, guests were alerted that mounting global inequality could, over the coming years, become equally destabilizing. Addressing the audience on the theme of inequality, President and CEO of the World Business Council for Sustainable Development Peter Bakker described the three biggest challenges of our time as the climate emergency, loss of nature, and mounting inequality. “I think most of you will by now have got the memo on



In the Experience Dome, visitors marveled at the entire value chain up to the finished product.



Watch this video interview with Circular Food Solutions Switzerland to learn more about upcycling spent grain into tasty meat alternatives.

climate change,” he said. “I would argue that you are not yet comfortable with your role when it comes to inequality. When we are all back in this room [at the next Networking Days in three years], inequality will be as urgent as climate change is today. Society is no longer going to put up with big differences in wealth and with deep structural differences in access to opportunities.” He warned the time had come for business to start talking about inequality, system transformation, the need to innovate, behavior change, and financial flows.

Izzy Obeng, CEO of Foundervine, a start-up accelerator dedicated to removing the social and economic barriers faced by today’s entrepreneurs, called for businesses to do more to improve diversity within their ecosystems and for companies to invest more in their local communities. She presented stark statistics and stated that only 1 cent in every euro of venture capital funding went to all-female teams in 2020, with 15 cents per euro going to mixed-gender founding teams. In comparison, 84 cents per euro go to all-male founding teams. Only 38 black entrepreneurs managed to raise venture capital funding between 2009 and 2019, representing only 0.5 percent of the total capital allocated over the 10 years.

“As leaders we have a real opportunity to set the standards that give a voice to those that traditionally have not had one,” said Obeng. “You must strengthen communities that have been historically marginalized and see where your companies and you as an individual can provide opportunities for financial inclusion and wealth building.”

Business supports education

To successfully address such complex challenges as wealth inequality, biodiversity loss, and climate change, businesses will increasingly need to depend on a skilled, resilient, and versatile workforce. During a session on the role of education in accelerating change, leading representatives from academic institutions called for greater cooperation between academic institutions and the business world to help build future skills. In particular, speakers described the need for more opportunities in experiential learning for students and called on businesses to work with local academic institutions to best achieve this.

“You can see companies absorbing a workforce prepared in universities or you can see companies being part of the education system, which is what we see at Bühler, and many other companies based in Switzerland,” explained Joël Mesot, President of ETH Zurich. He described the merit of the Swiss education system and the recognition of the need for a social contract between companies and society to take care of the next generation for the good of

“SOCIETY IS NO LONGER GOING TO PUT UP WITH BIG DIFFERENCES IN WEALTH AND WITH DEEP STRUCTURAL DIFFERENCES IN ACCESS TO OPPORTUNITIES.”

PETER BAKKER

President and CEO of the World Business Council for Sustainable Development

Watch the video interview with Izzy Obeng about inequality in the start-up community.





Suzi LeVine, former US Ambassador to Switzerland and Liechtenstein, shared her thoughts on the role of education in successful business development.

“AS LEADERS WE HAVE A REAL OPPORTUNITY TO SET THE STANDARDS THAT *GIVE A VOICE TO THOSE THAT TRADITIONALLY HAVE NOT HAD ONE.*”



Watch the video interview with Suzi LeVine to learn how companies can help combat the global talent shortage.

IZZY OBENG
CEO of Foundervine

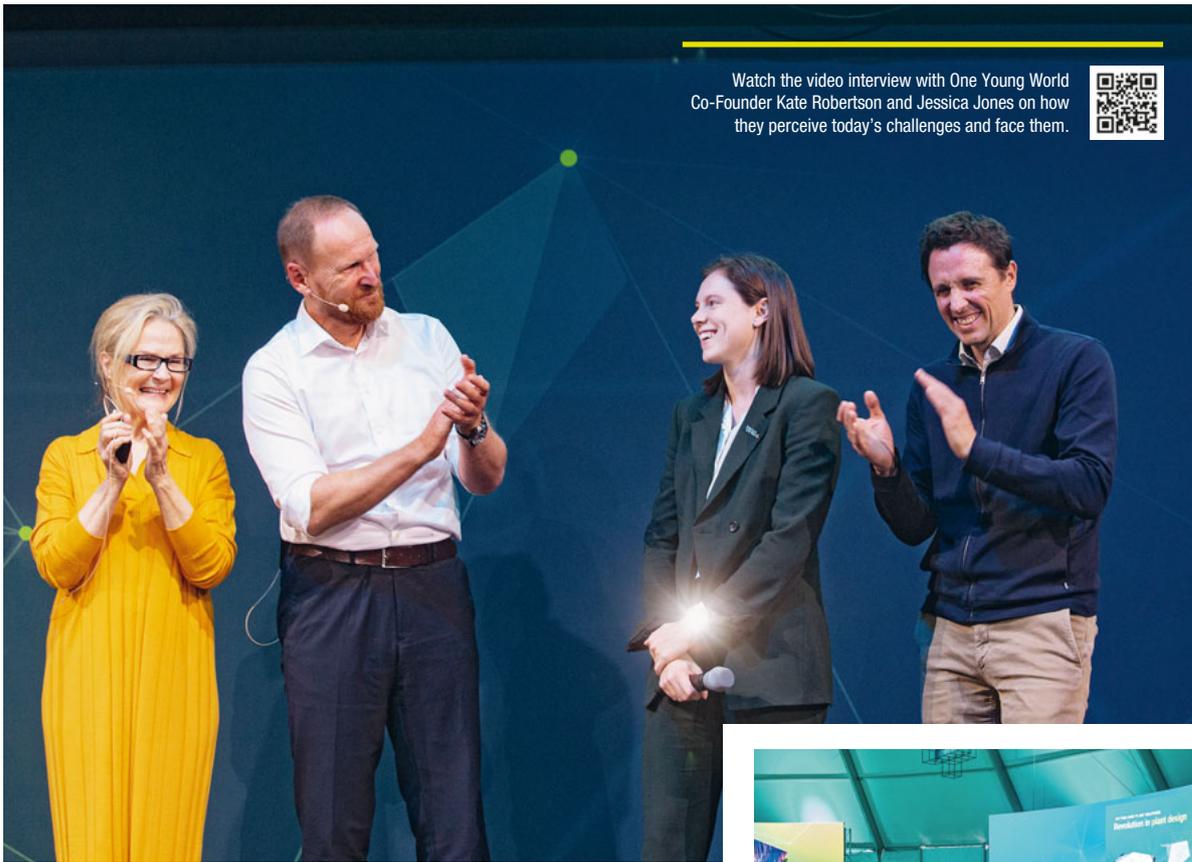


The open-plan Experience Dome invited visitors to linger and network.

Watch the video interview with One Young World Co-Founder Kate Robertson and Jessica Jones on how they perceive today's challenges and face them.



At the founding of One Young World Switzerland, Jessica Jones was appointed as the first Managing Director.

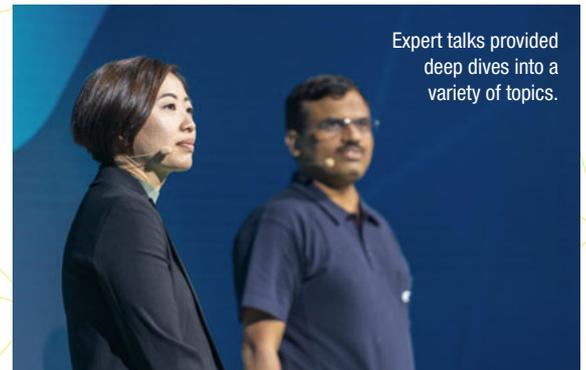


the whole community. "It means we can send our students into industry rather than an academic laboratory or they can spend a semester in an exchange with a real company. It gives them exposure and allows businesses to see talent, so that together we are bringing up the next generation of talent," said Martin Vetterli, President of the Swiss Federal Institute of Technology (EPFL). Speakers also warned that the traditional model of episodic education that ended with university was no longer fit for purpose when catering for a dynamic job market requiring constant re-skilling.

Driving meaningful change

First launched in 2016, the Networking Days are held every three years as an opportunity for businesses in the food, animal nutrition, and mobility sectors to share ideas while inspiring and motivating change. "Let's ensure that over the coming months and years we are creating the impact that is absolutely necessary," said Scheiber.

Closing the event, he emphasized the range of opportunities available to address the current global challenges. "These two days have proven how massive the potential is to drive meaningful change in so many important areas. I'm so encouraged by the countless interactions and the common desire to accelerate our impact, across industries and on a global scale. Together we can and we will, create a better, more sustainable, and fairer world for future generations," said Scheiber.



Expert talks provided deep dives into a variety of topics.

VIDEO



Watch the wrap-up video of the Bühler Networking Days 2022.

Jo de Boeck, Chief Strategy Officer and Executive Vice President of imec, offered a unique insight into the world of optical sensors.



Watch the video interview with Jo De Boeck about the role of sensors in our daily life today and in the future.



Media professionals from around the world have covered Networking Days, including podcaster Elysabeth Alfano.

“TOGETHER WE ARE BRINGING UP THE NEXT GENERATION OF TALENT.”

MARTIN VETTERLI

President of Swiss Federal Institute of Technology Lausanne (EPFL)



Good employees make a company successful. Bühler also presented its training concept in the Ecosystem Tent.

Bühler's new flagship hammer mill

TEN YEARS OF INNOVATION PACKED



INTO



MACHINE

TEXT: JANET ANDERSON

How do you successfully bring innovation to a proven machine category? The hammer mill has been around for a century and is used today in scores of different industries worldwide, yet a team at Bühler thought there was potential for improvement and set themselves this challenge. The Granulex® 5 Series hammer mill portfolio is the result – a machine that brings together a decade of development to make a huge leap in performance.

ONE OF THE MOST widely used and adaptable pieces of grinding equipment, hammer mills are found in most industrial food, feed, and grain processing facilities. There are many applications, and for each one there is a specific hammer mill design. Indeed, the variety of designs on offer is so great that it can sometimes be difficult for customers to decide which is the best for their application. A team at Bühler set out to tackle this challenge by creating one hammer mill to meet all the different requirements. “We decided to make the best, most flexible hammer mill system available,” explains Dean Ekkaia, Product Management Director Value Nutrition at Bühler.

To do this they looked not just at applications for animal feed production, but also across Bühler’s Grains & Food business. The team drew on over 10 years of research and development (R&D) in hammer mill technology. “Over the past decade we have made many individual developments. We built test grinding labs and tried out hundreds of new designs and concepts all around the world. All of this R&D is packed into our new flagship hammer mill,” says Ekkaia.

The result is the Granulex® 5, a modular system that can be configured in 360 different customized and optimized arrangements using only four machine footprints. This enables the customer to choose and install the most efficient equipment to meet their specific requirements in their industry. The new hammer mill also has the highest throughput ranges, an improved granulation profile, and reduced energy use per ton of ground product, all brought together in an operator-friendly design. It can also be connected to Bühler Insights to enable data-based decision making.

Driven by changing market requirements

Doing more with less is what everyone in business seeks to do, but in today’s difficult energy markets this has become a much more pressing requirement. As grinding is one of the most energy-consuming process steps in many plants, hammer mill customers are keen to find solutions that allow them to get more out with less energy.

The Granulex® 5 represents a big jump in performance compared to the competition. “That’s a huge benefit for our customers. They get a better quality of grind and higher throughput with less energy and lower costs – all key factors in today’s highly competitive markets,” Ekkaia explains. Flexibility is also becoming more important for customers due to new requirements on the market.

Take just one example: the animal feed market. In Europe, animal welfare is an increasingly important factor for consumers. In many supermarkets, meat products are labeled with an animal welfare



Simple access and ergonomic handling of all wear elements, like hammer screens and impact plates, reduces changeover times by around 50 percent.

The optimized design reduces unwanted fines and ensures that raw material is ground at precisely the required granulation.

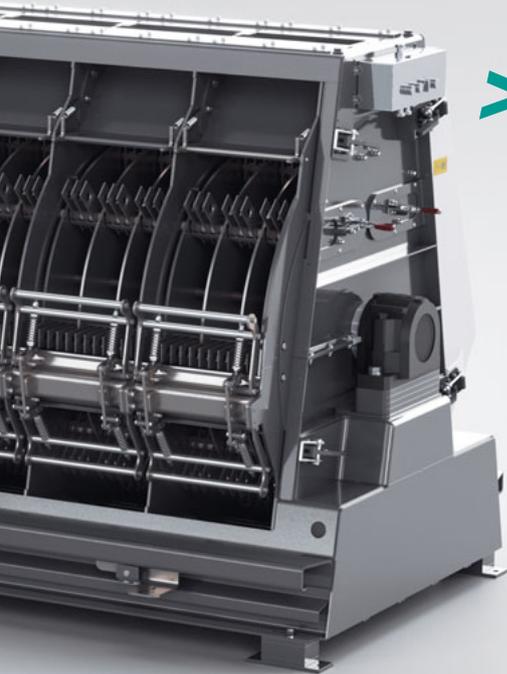
score. One of the contributors to the score is whether the animal is given feed that is adjusted to its needs. This is where the new hammer mill comes in. “Getting the right level of granularity plays a key role in ensuring the feed is appropriate,” says Reto Bischof, Head of Research & Development Value Nutrition at Bühler. “The new Granulex® 5 allows customers to get exactly the level they require.”

Another industry where grinding plays a key role is pet food manufacturing. The requirements here are increasing too. With people increasingly seeing their pets as part of the family, they become choosier about the pet food they buy. Pet food manufacturers therefore need a machine that can provide the quality of product that the market demands.

“There was a need for a machine that could handle all these shifts in requirements – that could deliver the perfect process for the perfect product,” Bischof explains. “With our new machine we can address these demands.”

Besides the changing nature of the products manufactured using hammer mills, there has also been a change in size requirements, with customers looking for larger machines. The reason behind this is, again, the search for increased efficiency. “Customers want to run one big line rather than two smaller

> 10%
REDUCTION
IN ENERGY
PER TON



> 10%

**CAPACITY
INCREASE**

VIDEO



Learn how the team developed the Granulex® 5 in this video.

VIDEO



See the Granulex® 5 in action in this video.

**“WE DECIDED TO MAKE THE
BEST, MOST FLEXIBLE HAMMER
MILL SYSTEM AVAILABLE FOR OUR
CUSTOMERS.”**

DEAN EKKAIA

Product Management Director Value Nutrition at Bühler



50%

**REDUCTION
IN CHANGEOVER
TIME**

lines. This enables them to increase capacity without having to increase the size of their building to house a second line,” says Bischof.

The modular design of the Granulex® 5 meets this need. Similar to the way that automobiles are designed today, Bühler’s new hammer mill offers a basic platform that allows a choice of machine size. The smallest machine size has a single grinding chamber and feeding unit; the largest size has four grinding chambers. With each addition comes a bigger feeding unit and bigger motor, all standing on a sturdy machine base.

Optimizing processes

“The grinding chamber is where the magic happens,” says Bischof. Coarser or finer grinding can be delivered depending on what is required. The options are covered by two different rotor diameters, either of which can be installed in the same housing and on the same platform.

The machine can also be configured to achieve many different process parameters, for example by using different screens or with additional impact plates that increase the grinding work applied to the product. The hammer mill can also be run at different speeds and the distance between the hammer

“OUR NEW HAMMER MILL IS FULLY FLEXIBLE AND CAN ADAPT TO EACH AND EVERY PRODUCT AND END TARGET.”

RETO BISCHOF

Head of Research & Development Value Nutrition at Bühler

and screen can be adjusted. “Our new hammer mill is fully flexible and can adapt to each and every product and end target,” says Bischof. “Today, a customer needs to buy different machines for different applications. We can configure this machine to every application and fine-tune it for every process. This not only produces the best results out of every raw material – it also brings energy efficiencies.”

A decade of innovation

The team also thought hard about how to reduce time and therefore cost in operation. For example, customers often have to change screens, so these have been made more accessible and easier to handle so that they can be changed over very quickly. Some operators change screens once or twice a day, so speed is a huge customer requirement

Another time-saving development relates to the hammers themselves. Instead of exchanging hammers one at a time, the novel hammer cage allows groups of hammers to be replaced at the same time. The task can be carried out by a single operator, even for the biggest version of the Granulex® 5. “We have the industry’s fastest screen and hammer change-over for this type of hammer mill,” Ekkaia explains. “That reduces operating expense and downtime.”

The design is both robust and equipped with standard vibration and temperature sensors. The Granulex® 5 is also ready to connect to Bühler cloud applications, enabling further optimization and supporting customers in better decision-making with data transparency and preventive information. It’s an impressive result that has already met with approval from early customers including those who tested the prototype and visitors who witnessed it firsthand at VIV Victam in the Netherlands in early June this year. There isn’t just one key to this success, according to Bischof, but many.

Ten years of research and development have gone into the Granulex® 5 Series hammer mill. Over this time, the team tested hundreds of different elements, from the hammer cages to rotor diameters, in

Bühler’s labs and customer applications around the world. “We worked closely with our customers, their materials, and their recipes. Our global lab set-up is what makes us unique. We are close to customers everywhere. And this means we have covered a wide variety of applications in our testing,” says Bischof.

Live development with customers

Customers were involved in the development process from early on. An early version of the machine was installed on-site with Agravis, one of the largest manufacturers of compound feed in Germany. At their plant in Münster, Agravis produce nearly 500,000 tons of feed a year, primarily for pigs, cattle, and poultry, and in every structure – flour, pressed, and granulated. Rising energy costs mean that the business has been looking for energy-optimized processes.

With the prototype machine running for hundreds of hours at the Agravis plant, the Bühler team gained insights into the performance and operation and could see and deal with issues directly. Agravis were impressed by the results. “We have an improved feed structure, and we can influence granulation more precisely,” says Heiko Almann, Managing Director at Agravis.



VIDEO



Watch the video about how our customer Agravis is using Granulex® 5.



“That’s good for animal welfare and performance. And in comparison to our existing hammer mills, we see energy savings.”

Gaining early traction in the market

Meanwhile, the machines in the Bühler labs ran next to the development process. This made it possible to see each loop of development directly – as each new feature was implemented, the team could see immediately what worked and fix what didn’t.

This hands-on, design-thinking process means that every element of the Granulex® 5 already has data behind it and is already industry-proven ready for the launch. “We know if it makes the cut and delivers benefits for the customer. And we can prove the performance because we have tested it all along,” says Ekkaia. “We know how the machine performs and how it is optimized. We know about the dependencies in the design, and we have also increased our understanding of the principles and specifics of the physics of grinding. It has stepped up our expertise and that is a benefit for our customers.”

There is already high awareness of the new hammer mill, and a lot of demand and interest picked up even prior to the official launch. “We got a good market response from VIV/Victam International in the Netherlands – the most important animal nutri-

tion fair in Europe – and at the Victam Asia exhibition in Bangkok, the feeling among customers was that our hammer mill is set to become the new benchmark for grinding in the animal feed market,” Bischof explains.

With the new Granulex® 5, customers get fine-tuned granulation at a lower energy and operational cost. “By pulling together 10 years of R&D, putting all the elements to the test, and bringing all the best pieces together in a modular platform, we’ve succeeded in bringing new innovation to an old machine category,” says Ekkaia.

The new hammer mill portfolio will be launched on the market at the end of 2022.

INNOVATION

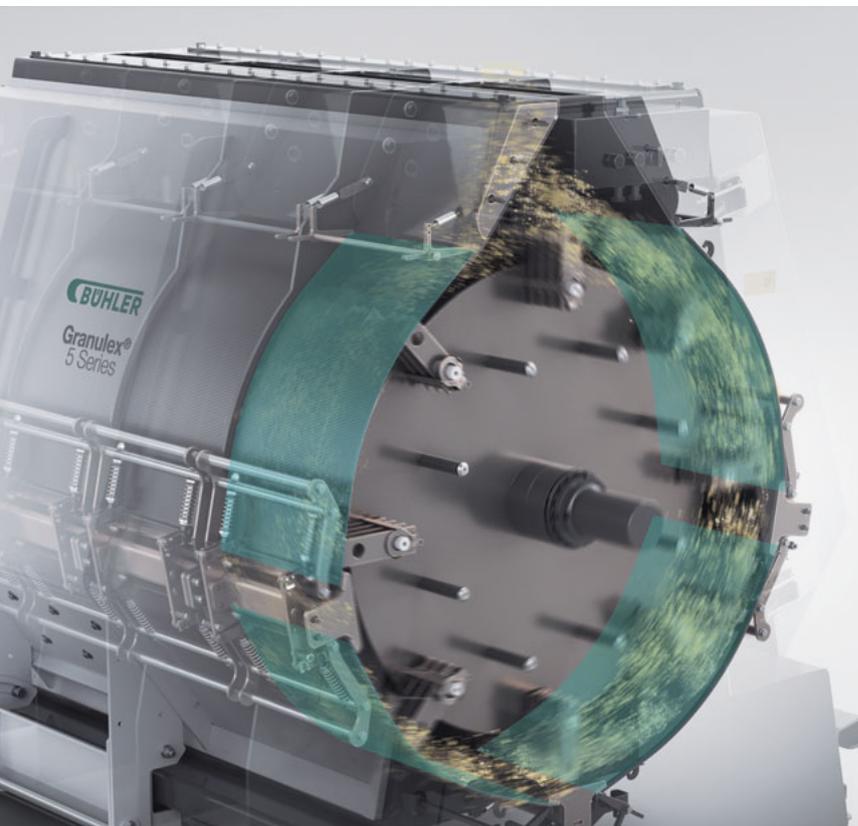
A HANDS-ON APPROACH TO INNOVATION

The design process for the Granulex® 5 Series hammer mill was unique for Bühler in that the team started building the machine in the lab even as the development process was ongoing. This meant that each loop of development was directly implemented in the lab, so they could see everything that worked and everything that didn’t.

The reason for this is that while computer simulation plays a key role in design, it is not possible to replicate everything in the digital world – particularly not the physical act of grinding a natural product. For this, only hands-on experimentation could deliver the insights that were needed.

The team therefore built a functional prototype at the application center at Bühler headquarters in Uzwil, Switzerland. It was like a live twin of the digital concept. Whenever they came up with a new feature or module, it was installed in the lab.

This hands-on innovation method was proven when the first machine, installed with an early customer, was switched on. They pushed the green button and it worked the way they expected, meeting all the requirements from day one.



The innovative machine design ensures consistent grinding quality even in demanding industries with high requirements and scaled output.



MULINO
MAROGGIA

TEXT: DALEN JACOMINO

**RISING
FROM THE**

November 23, 2020 was a devastating day in the history of Mulino Maroggia, the only industrial flour mill in the canton of Ticino, Switzerland. A fire broke out at the facility, quickly destroying most of its structure. Since then, Bühler teams have been working closely with Alessandro Fontana, Owner and Managing Director of Mulino Maroggia, and his team to rebuild the plant. Thanks to joint efforts, the mill is scheduled to be operational in the first half of 2023.

FLASHES

IT ALL STARTED a few minutes after five o'clock in the afternoon of Monday, November 23, 2020. The fire most probably started at the warehouse on the ground floor, according to the experts, and quickly spread through Mulino Maroggia's main building. No one was injured, but the fire caused extensive damage to the structure.

During that afternoon and evening, people living close by were advised to keep their doors and windows closed and avoid approaching the fire area. The tragedy impacted not only the owner's family and employees, but the whole community of Maroggia, a former municipality in the canton of Ticino which now is part of Val Mara, with a population of about 730.

In the middle of the chaos, still on that tragic Monday, while firefighters were trying to put out the fire, Alessandro Fontana, Owner and Managing Director of Mulino Maroggia, called Bühler for help. On the other end of the video call was Martin Ruckstuhl, Sales Manager for Milling Solutions in Switzerland, who could see some of the flames in the



“MULINO MAROGGIA IS NOT JUST A MILL, IT IS OUR HOME. IT IS OUR LIFE. THIS IS WHERE I GREW UP.”

ALESSANDRO FONTANA

Owner and Managing Director of Mulino Maroggia

background of the call and experience the tension in the air. Fontana and his team needed immediate assistance. They needed to get the right advice and full support to manage Mulino Maroggia out of that crisis. Even as the mill was burning, the mindset was to rebuild and rise from the ashes.

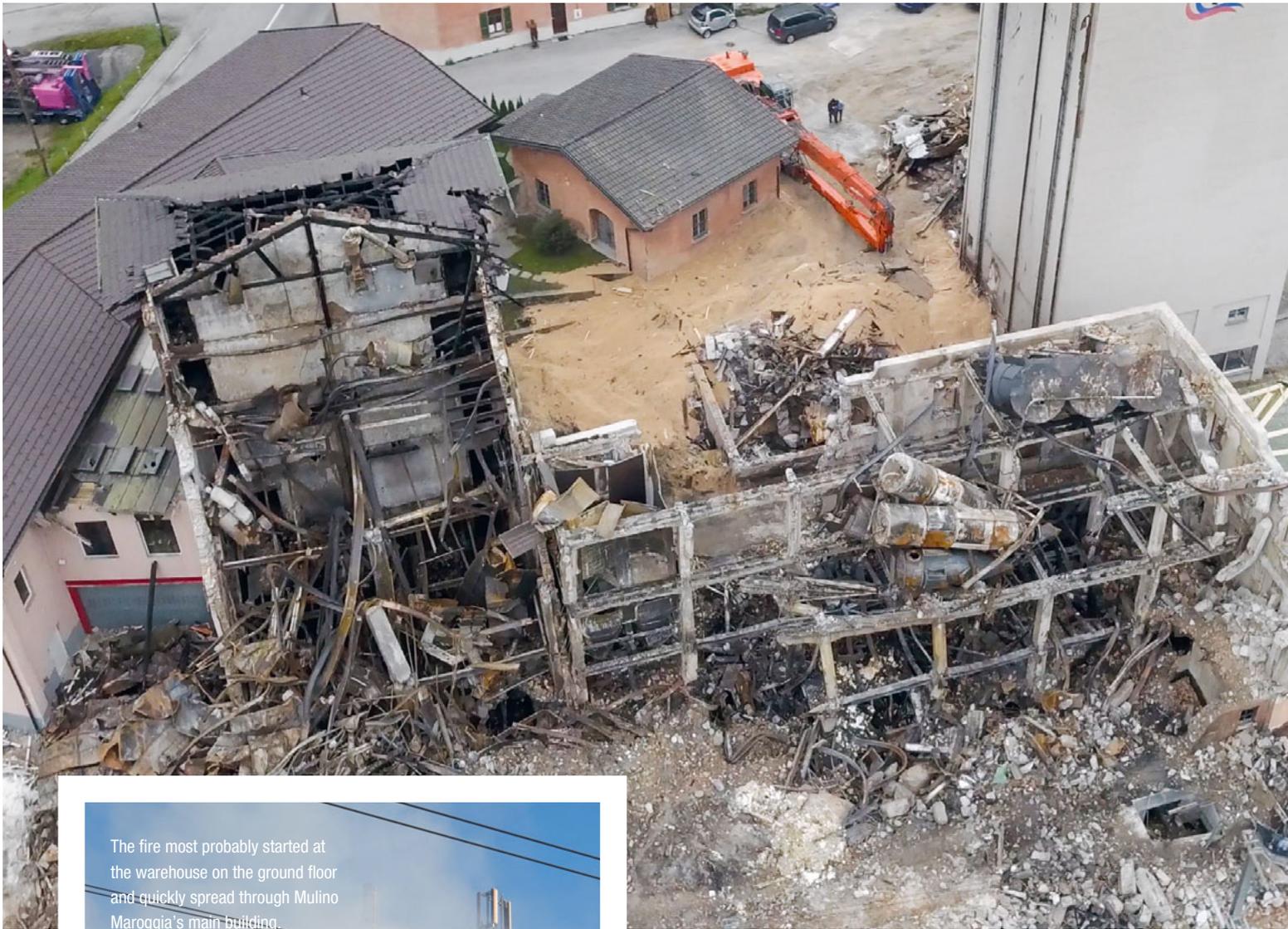
“We were shocked and saddened to see that scary scene. The fire was still burning; so at this point they could not confirm the exact impact. We knew that Alessandro needed us, and we were ready to be a trusted partner for him in such a challenging time,” Ruckstuhl recalls.

Forging a long-lasting relationship

Mulino Maroggia and Bühler have a relationship that is nearing its 100-year anniversary. The business was founded in the late 1800s by Michael Stadlin, a descendant of an ancient family of millers active in central Switzerland. In 1888, the Stadlin family took over the Raggi e Contestabile mill based



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The fire most probably started at the warehouse on the ground floor and quickly spread through Mulino Maroggia's main building.



in Maroggia, a village that has always been connected to milling activities in the Italian part of Switzerland.

In 1904, the Stadlin family purchased a rice mill located on the site where Mulino Maroggia is located. The rice mill was then demolished to make room for a new mill, which was ideally situated thanks to its easy access to the railway line, a track that even today is essential for the national supply of bulk grain. The structure was completed with the construction of a wooden silo. The new mill built by Bühler began operations in 1924.

Since then, the company has been on quite a journey. In 1998, a violent hailstorm around Maroggia and the lower Mara valley, followed by a cloudburst, completely flooded Mulino Maroggia, damaging the buildings, making the machinery unusable and destroying the stocks of finished products. The desire to keep the milling tradition alive led the then owner, Luigi Fontana, to decide on the renovation of the complex. This move was strongly influenced by his son Alessandro's decision to continue the family



“WE KNEW THAT ALESSANDRO NEEDED US, AND WE WERE READY TO BE A TRUSTED PARTNER FOR HIM IN SUCH A CHALLENGING TIME.”

MARTIN RUCKSTUHL

Sales Manager for Milling Solutions in Switzerland at Bühler

business. Back then, a Bühler team also took up the challenge to support the Fontana family in its quest to rebuild it.

This event brought the companies even closer. “After the incident in 1998, we had to repair and replace some equipment, stay in alignment, and give advice and support when needed. The mill was in good shape until the fire,” says Ruckstuhl, who wasn’t responsible for the customer at that time but was fully briefed by his predecessor when he took Mulino Maroggia’s account. “Later, of course, Alessandro Fontana explained all the details of this incident to me as well.”

As a manager focused on innovation, Fontana continuously upgraded the plant and ensured regular maintenance. He also developed new products, new labels, and built up a platform for e-commerce business. In 2017, the oldest part of the plant was renovated to accommodate a larger and more practical warehouse for packaged products. In addition, a new area of about 170 square meters was refurbished, becoming a space for visitors and for holding

events. At the same time a mixing and bagging line for special products was implemented in the production area. The mill was then fully automated.

“We are a family company with a very resilient culture. Over the last years, we have increased our production, and created a new line of products. This happened thanks to our collaboration with grain producers in the region,” Fontana explains. “Mulino Maroggia is not just a mill, it is our home, it is our life. This is where I grew up.”

Fontana also dreamed of making the milling world more accessible to the public to increase awareness of the industry’s vital role in feeding and nourishing people. “With the dedicated visitor

space and right infrastructure developed in 2017, we were able to open the doors to the public and let them discover how we produce various types of flour,” explains Fontana.

Taking care of the team

Everything was running smoothly until that fateful day in November 2020. The fire and its devastation were certainly the toughest test in the history of Mulino Maroggia. Besides Alessandro Fontana’s family, the 16 employees and their respective families were hardest hit by the fact that the mill was no longer operational.

The population of Maroggia and the region have been very supportive. Fontana highlights the solidarity of the people, who, in addition to the positive and motivational words, have donated more than CHF 50,000 during the last few months to support the company. “We have realized how much the mill is imprinted in the DNA of Maroggia and region. All this pushes us forward. People want to see us reborn,” says Fontana. He also explains that as yet

there is no specific destination for the donation made by the community. “We are counting on that amount as a reserve for the future.”

Nearly two years after the tragedy, there is still no clear explanation for the cause of the fire, which razed the mill to the ground, destroyed 180 machines and electrical components, and an old wheat silo nearby. A concrete wheat silo built in the 1950s, a storage room for flour bags, and a newly renovated area used for training and events were not affected by the fire.

Due to the extensive damage to the machinery, it was impossible to continue production. Nevertheless, one of the top priorities for Fontana was to make sure his employees had support and could keep working. For that, he looked for a custom solution. During the construction period, one employee from production, for example, worked part time at the warehouse; another employee shared his activi-

“AFTER THE CALL ON THE DAY OF THE FIRE, WE IMMEDIATELY ESTABLISHED A BÜHLER SUPPORT TEAM, STARTED TO DESIGN THE NEW FLOW SHEETS, AND TOGETHER WITH HIS ARCHITECT BEGAN TO CONCEIVE THE NEW MULINO MAROGGIA MILL.”

MARTIN RUCKSTUHL

Sales Manager for Milling Solutions in Switzerland at Bühler

ties between the warehouse and the construction site (since he had the requisite skills and knowledge). For another employee, Fontana found a temporary job in another company. There weren't changes in the team working at the administration since there was still work to be done.

In fact, Fontana didn't stop attending to his customers. He was able to establish a cooperation with Knecht Mühle AG, based in Leibstadt, to process the grains for his company during the construction of his new mill. The company produced the flour according to Mulino Maroggia's specifications. Alessandro and his team took care of the orders, received the goods, and delivered the flour to its customers. One Mulino Maroggia employee worked temporarily at Knecht to support this process.

Back to November 2020: “After the call with Alessandro on the day of the fire, we immediately established a Bühler support team. From the beginning, Alessandro was clear: in two years he wanted to rebuild the mill and get back to production – at the same location. As soon as possible, we started to design the new flow sheets, and together with his architect, began to conceive the new Mulino Maroggia mill,” explains Ruckstuhl.

Diving into the details

Many aspects had to be factored in for the rebuild and many decisions had to be made. Rene Thöny, Team Manager for Customer Projects at Bühler, who oversees Mulino Maroggia's project, was prepared. “There were many aspects to be considered and many decisions to be made. Therefore, for us, it was crucial to involve all different teams at a very early stage and be very transparent to the customer

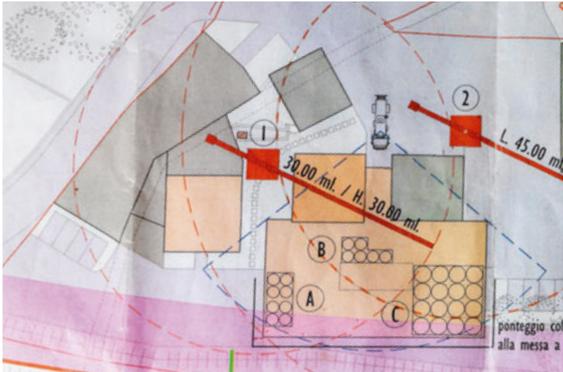
regarding the situation and potential challenges,” Thöny explains. A project like this, says Thöny, is like building a house. “At the very beginning, we do not talk about details, we need to have a rough idea about the location, building dimensions, number of rooms, etc. And from there, we move deeper and deeper into the details until all of them are defined and agreed.”

In the case of building a mill, the project is in general structured in six phases: initiation and conception, basic engineering, detailed engineering, installation, commissioning, and project closing. Once the design is approved by the customer (end of basic engineering), the details regarding the manufacturing of Bühler's equipment and the detailed building specifications for the construction of the building are worked out, the project

moves to the execution phase. With that step completed, Mulino Maroggia can execute the building and Bühler can order and deliver all the machines, transport elements, and accessories in the correct quantity and the required specifications.

In parallel to the mechanical part of the project, the hardware is planned, manufactured, and delivered, and programming is carried out on Mercury MES, Bühler's Manufacturing Execution System which integrates all processes to increase efficiency and traceability for a clearer look at the key data. Bühler Insights, a platform for connecting products and services to optimize plant efficiency, will also be integrated into the mill. Other service modules, such as Yield Manufacturing System (YMS), Error and Downtime Analysis (EDA), Temperature and

It was fundamental to involve all of the different teams at the very early stage of the reconstruction and be very transparent to the customer regarding potential challenges.



The building should be finished by the end of 2022 and installation of the mill is scheduled to start in January 2023.



“BEFORE, WE WERE USING ABOUT 60 PERCENT OF THE MILL’S CAPACITY. WITH THE NEW MILL AND NEW BUILDING, WE WILL EASILY REACH FULL CAPACITY.”

ALESSANDRO FONTANA

Owner and Managing Director of Mulino Maroggia

Vibration Management Service (TVM), and Replay are also included in the plan. Mulino Maroggia's project will have a capacity to process 50 tons per day, which is similar to what it was able to produce before the fire. The mill encompasses rails and truck intake, pre-cleaning, wheat storage, enhanced cleaning, and production lines for processing conventional and local organic grains.

Working at full capacity

It also has flour storage and finished product packaging as well as a bulk loading system. "One of the differences is that before we were using about 60 percent of the mill's capacity. The equipment was relatively new, but the production building was old, which hindered the flow of production. With the new mill and new building, we will easily reach full capacity," explains Fontana.

Each phase of the project requires different expertise. Throughout the entire journey, which should last a bit more than two years, 20 to 30 Bühler experts will have worked on that project. From the Mulino Maroggia side, Fontana and his team were fully engaged in every phase, with alignment meetings taking place on a weekly basis.

In fact, at the beginning, the teams also faced the restrictions imposed by the Covid-19 pandemic and had several meetings online. "It was a crazy time. I had so many new challenges at the same time. The coronavirus pandemic was one of them. I remember coming to Uzwil and finding Bühler's building empty. It was very unusual, but we kept it going. We didn't stop," explains Fontana.

In August 2022, the final planning was completed, all equipment was ordered, and most of the pieces were manufactured. Internal and external coordination with the customer, building contractors, installation teams, and the manufacturing site were still ongoing throughout the second half of 2022; automation engineering also progressed during that period. According to Fontana, the building should be finished by the end of 2022 and installation of the mill is scheduled to start in January 2023.

"With this new mill, we will take a step further in our digitalization journey, having a state-of-the-art mill with the latest technologies available to control and measure production, and a much better production flow due to the full integration between the building design and the mill," says Fontana.



"WE WILL TAKE A STEP FURTHER IN OUR DIGITALIZATION JOURNEY BY HAVING A MILL WITH THE LATEST TECHNOLOGIES AVAILABLE TO CONTROL AND MEASURE PRODUCTION, AS WELL AS A MUCH BETTER PRODUCTION FLOW DUE TO THE FULL INTEGRATION BETWEEN THE BUILDING DESIGN AND THE MILL."

ALESSANDRO FONTANA

Owner and Managing Director of Mulino Maroggia

The mill is planned to go into operation in May 2023. This is when a new phase starts for Fontana, his employees, and the community of Maroggia. Fontana and his family have chosen to persevere – and rebuild the mill. They used the tragedy as an opportunity to advance in his goal of nourishing the community with healthy and local products. Bühler is proud to be a partner in this venture.



HAVE YOUR CUP AND EAT IT!

TEXT: OLIVER BRIESE
PHOTOS: NEVER KNOW PRODUCTIONS

For millions of us it is an established routine: the cup of coffee on the go in the morning, during a lunch break, or while flying on a plane. But the environmental impact of our coffee drinking habits leaves a bitter taste. Millions of plastic cups are used daily, piling up mountains of waste. So, what do we do? Bring our own cup or even give up on our beloved cup of coffee to go? Bulgarian start-up Cupffee has developed an altogether more digestible solution.





The cups are made out of a solid dough that has a neutral flavor. The dough is placed in molds to create the cups and then baked for around 190 seconds.

“I CAME UP WITH THE IDEA OF THE EDIBLE CUP IN MY EARLY SCHOOL YEARS. I WAS SHOCKED BY THE SHEER NUMBER OF PLASTIC CUPS USED DAILY FOR HOT BEVERAGES THAT END UP AS WASTE.”

MIROSLAV ZAPRYANOV
CEO and Founder of Cupffee

PLASTIC CUPS are popular for a good reason – they are economical, convenient, hygienic, durable, and lightweight. As a coating, plastic makes paper cups heat resistant and safe for hot beverages on the go. But this convenience comes at a cost to the environment: 16 billion plastic cups alone are used every year. With barely 1 percent of these being recycled, most end up in garbage bins or worse still as litter.

Today plastic waste is omnipresent; it is found on mountain tops and in the deep sea. Plastic particles can be detected in animals and humans with potentially detrimental effects on our health. It is a problem on a massive scale. Seven billion tons of plastic produced between 1950 and 2017 turned into waste. Every year, 400 million tons of plastic waste are produced globally, according to a 2021 report from the United Nations Environment Programme.

The Bulgarian start-up Cupffee offers an innovative and sustainable alternative. What if instead of throwing away your cup you could simply eat it –

what better way to dispose of it? Cupffee is just that – a cup you can eat with your coffee. It is often young entrepreneurs who identify new opportunities, take on the challenges, apply their knowledge, and have the dedication and commitment to see them through. Miroslav Zapryanov, CEO and Founder of Cupffee started his entrepreneurial journey at a very young age.

“I came up with the idea of the edible cup in my early school years. I was shocked by the sheer number of plastic cups used daily for hot beverages that end up as waste,” says Zapryanov. In 2004, he baked



The team at Cupffee tested different recipes to find one that would meet all their requirements. Food technologist Krasimira Prodanova examines a sample to see if it meets Cupffee's standards.



his first waffle cup using his oven at home. The idea stayed with him, and 10 years later, in 2014, convinced of the great potential, Zapryanov founded his company Cupffee, based in Plovdiv, the second-largest city in Bulgaria.

A crisp idea: the edible cup

For Zapryanov, Cupffee is more than just a clever business idea. Right from the start he was determined to make a difference by reducing waste and at the same time provide an enjoyable solution for coffee lovers around the world. The idea quickly attracted like-minded talent and partners that helped develop the company quickly.

The concept may sound simple but replicating the essential characteristics of a plastic cup using wafer is not straightforward. It took the innovators from Plovdiv a few years to develop the right recipe and ensure that the crispy wafer cups do not leak and stay crunchy. Another important challenge was that

the cups do not alter the taste of the beverages they contain. "Something which was very important for our cup was that its taste does not interfere with the taste of the beverage inside. It sounds easy but actually it's not, and that is the reason why nobody else has managed to reach our level," says Zapryanov.

After many trials and adjustments to the recipe, Cupffee reached the high standards required to succeed on the market. The cups withstand temperatures of up to 85° Celsius and perfectly insulate contents so drinkers do not burn their fingers. They also stay crunchy for at least 40 minutes, and at just 14 or 26 grams, depending on cup size, they are very lightweight. But the best part is that, after finishing the drink, the cup becomes a healthy snack containing only 56 or 105 kcal respectively.

“WE WERE *REALLY EXCITED* BY CUPFFEE’S ABILITY TO CREATE A PRODUCT THAT COULD RESIST WATER AND TEMPERATURE *TO SUCH A HIGH STANDARD.*”

GEORGI YANAKIEV
International Sales Manager at Bühler



VIDEO



Take a look inside
Cupffee's production plant in
Plovdiv, Bulgaria.

Furthermore, as it is made of oat bran, a 100 percent natural by-product of the milling process, it is also highly sustainable. Upcycled from milling side streams, it is the perfect material for healthy edible food containers.

Stepping up to large-scale production

Cupffee managed the initial stages of the product development on their own remarkably well. The Cupffee CEO invested his personal funds to design and finance his first prototype machines. Once the fourth machine was installed, Cupffee started their production line with an output of 100 cups a day. The team worked 10 hours a day to reach this modest output – not enough to compete in the market.

In today's fast-paced business world, companies need to adapt to customer demand quickly to succeed. The shift from initial concept to production on a large scale can be a daunting challenge. This is the point where a larger industrial partner can play a critical part. The young start-up's success caught Bühler's interest in 2016.

“We were really excited by Cupffee's ability to create a product that could resist water and temperature to such a high standard,” says Georgi Yanakiev, International Sales Manager at Bühler. Subsequently, Bühler invited the team for trials at Bühler's Wafer Innovation Center in Leobendorf, Austria. Bühler had already gained substantial expertise in formulating and producing edible and compostable food containers. It all started in the early 2000s with the development of starch-based biodegradable containers for Biopack. Cupffee represented a new exciting challenge.

In 2017 Cupffee and Bühler joined forces to take the innovative and sustainable product to the next level and develop a market-ready product to manufacturing scale. “This was exactly the right moment,” Zapryanov explains. “We had a great product, but the market required large volumes of our cups and our small-scale machines simply did not have the capacity to satisfy demand.”



Bühler's Franz Haas MTA-V oven provided the industrial solution Cupffee needed to increase capacity. It produces around 3,400 cups an hour.

"IT IS OUR AIM TO INCREASE OUR PRODUCTION TO TWO TO THREE TIMES THE CURRENT VOLUME WITHIN THE NEXT TWO YEARS."

MIROSLAV ZAPRYANOV
CEO and Founder of Cupffee

Bühler's Franz Haas MTA-V oven for solid dough and the production line for edible cups proved the right solution for the Bulgarian entrepreneurs and the cooperation took shape. With Bühler's help, Cupffee increased capacity to approximately three million cups per month.

But global demand is strong, and the company has ambitious targets. "It is our aim to increase our production to two to three times the current volume within the next two years," says Zarko Penchev, Head of Production Process at Cupffee.

Two more production lines are planned at the factory in Plovdiv. With the peace of mind that Bühler's 360° degree/lifetime customer services bring, Cupffee is well equipped for future growth. Both companies are committed to further developing a long-term partnership.

Drinking pleasure fit for a queen

The edible cups have been a hit and demand is growing. Cupffee already has an impressive portfolio of partners and clients that share the company's enthusiasm and commitment for sustainable food solutions. Among these are German retail discounter

Lidl and leading Italian coffee company Lavazza, which promotes the product in several markets and at prestigious events. Giuseppe Lavazza, Vice President of the Board of Directors of Luigi Lavazza S.p.A., and Queen Elizabeth II enjoyed coffee served in Cupffee cups at Wimbledon. And hot beverages were served in Cupffee's crispy cups on the first, single-use-plastic-free flight of Etihad Airways on Earth Day. Some achievement – clearly these customers had great confidence in the cups and their ability to contain hot drinks safely.

Given such prominent endorsement, the only way is up. With Bühler at its side, Cupffee plans to reach a production output of 10 million cups per month and eventually replace a minimum of 1 percent of the global supply of disposable plastic and carton coffee cups. "When it comes to industrial production, Bühler is the right partner for us," says Zapryanov. "We will continue to work together in the future."



THE MODERN MILLER

TEXT: BURKHARD BÖNDEL
PHOTOS: RALPH RICHTER

Bakers and millers have to cope with ever new, ever higher demands from their customers who are looking for a multitude of varieties of organic bread baked to the highest standards of taste. The Saalemühle Alsleben mill in eastern Germany holds its own as entrepreneurs in this dynamic environment – with three surprisingly simple recipes for success. At the heart of Saalemühle's prosperity are its highly trained millers.

YOU COULD EASILY IMAGINE this 21-year-old in a smart business outfit as a management trainee at Microsoft, Boston Consulting, or Nestlé. Quick-thinking and self-assured, Jonathan Gutting radiates professionalism. But instead of blue chinos, a light-colored shirt, and sneakers, he wears white work clothes and steel-toed shoes; instead of Zurich, London, or New York, his workplace is in Alsleben near Magdeburg, Germany. Instead of creating run-of-the-mill PowerPoint slides, he mills grain. Jonathan Gutting is a trained miller at Saalemühle in eastern Germany. To at least try his hand at the trade was an obvious choice for Gutting. His father is the co-owner of



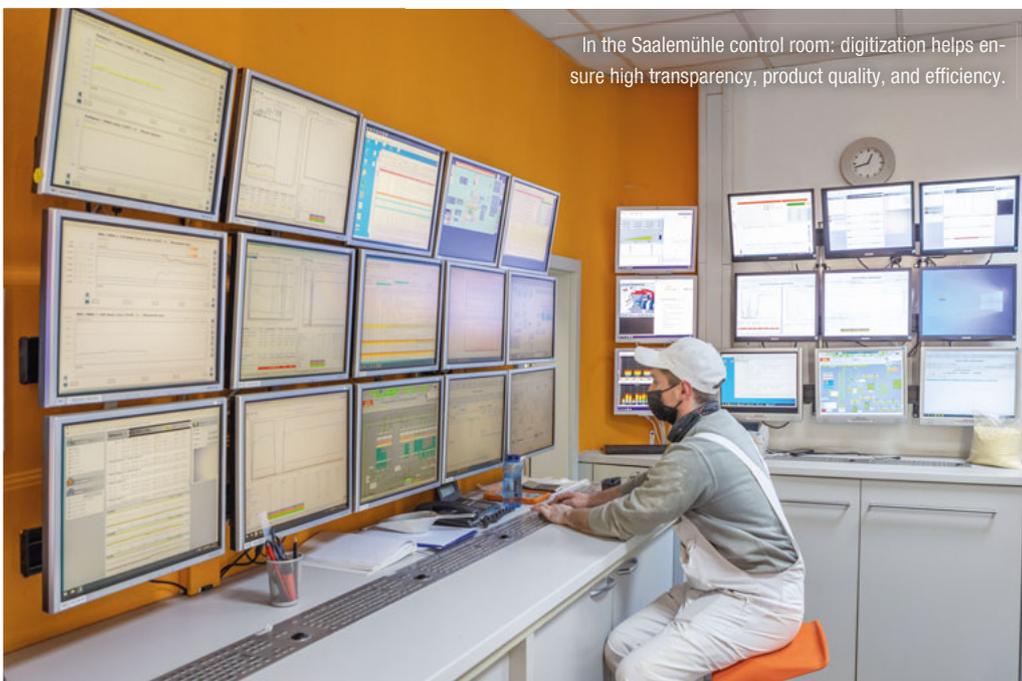


Saalemühle and also a skilled miller. This initial taste of the job quickly turned into a calling. “I’m fascinated by the breadth of the profession,” says Gutting. “In the past, the core qualification found in job postings was a truck driver’s license, so that the millers could drive the flour to the customer themselves, but those days are long gone.”

This is the absolute exception today – the requirements for millers are much more complex now. Following his apprenticeship, which the young man completed in 2021, he is now studying business administration in Vienna. This is an important move for Gutting, because if a company wants to success-

“MILLERS MUST BE AS FAMILIAR WITH RAW MATERIALS, PLANT TECHNOLOGY, AND DIGITALIZATION AS THEY ARE WITH MARKET TRENDS, ENVIRONMENTAL REGULATIONS, QUALITY MANAGEMENT, AND ACCOUNTING. THAT’S WHERE THE APPEAL OF THE MODERN MILLER’S PROFESSION LIES.”

JONATHAN GUTTING
Miller at Saalemühle



fully hold its own in the market today, millers must not only understand the entire value chain, from agriculture and the genetics of the plants to the milling processes, their customers, and the final products, the baked goods.

“Millers must be just as familiar with raw materials, plant technology, and digitalization as they are with market trends, environmental regulations, quality management, and accounting. And that’s where the appeal of the modern miller’s profession lies,” says Gutting. Contributing to a healthy diet with the staple food of flour and bread is intrinsically meaningful. In his opinion, however, the fun factor comes from the breadth of the task, the new challenges every day, the handling of state-of-the-art operating equipment, and the entrepreneurial responsibility: “Instead of sitting in the airplane cockpit, I sit in our control room – the procedures are identical, including autopilot,” Gutting explains.

A look at what’s happening at one of Saalemühle’s customers – the ARTiBack wholesale bakery near Halle – makes clear the dynamics that are emanating from the markets and consumers. ARTiBack processes up to 80 metric tons of flour a day into rolls,

baguettes, and bread. A few years ago, it was still sufficient to offer around 10 standard products, recalls Marc Michael Saam, one of the Managing Directors and Co-Founders. Today, ARTiBack has more than 50 different bakery products on its processing lines and maintains its own test bakery in order to consistently win over its customers – retailers, gas stations, hotels – with new product ideas, new shapes, unusual ingredients, and products for occasions and seasons. To arouse customers’ curiosity, the innovators at ARTiBack always come up with new eye-catchers: “Being hungry and satisfying that hunger used to be the focus, but today it’s about shelf attention and taste sensations,” Saam says.

Using only natural ingredients

In doing so, the young company, which was only founded in 2016, has clearly aligned itself: “We combine artisanal baking traditions with industrial processes,” Saam explains. “Only water, flour, yeast, salt, and other natural ingredients go into the dough. We deliberately refrain from adding baking agents and artificial enzymes, for example to make doughs rise faster or more machinable.” Instead, the doughs

INFO

SAALEMÜHLE

Saalemühle is part of the Bindewald Gutting Milling Group – one of the most powerful mill groups in Germany with an annual capacity of 1.7 million metric tons. Released from the state assets of the former GDR in 1992, the new owners have built up seven sites and have consistently focused on quality, flexibility, and efficiency. Saalemühle in Alsleben was the starting point of this development and today processes 500,000 metric tons.



“WE COMBINE ARTISANAL BAKING TRADITIONS WITH INDUSTRIAL PROCESSES. ONLY WATER, FLOUR, YEAST, SALT, AND OTHER NATURAL INGREDIENTS GO INTO THE DOUGH.”

MARC MICHAEL SAAM

Managing Director and Co-Founder at ARTiBack

are allowed to rest and mature for up to 36 hours before being machine-rolled, shaped, baked, frozen, and packaged. “This allows us to offer our customers bread and rolls with a rustic look, great taste, and sustainable product characteristics,” says Saam, explaining the company’s philosophy.

However, dispensing with artificial additives comes at a cost. The return to the origins of baking requires the highest quality and consistent properties for the flour on an industrial scale – otherwise the machine processes would not run reliably or the products would vary too much in terms of appearance and taste. The raw material must fit very narrow parameters in terms of its quality and behavior in the baking process. “We can’t compensate for deviations and deficiencies in the flour with chemical additives,” explains Saam.

In order to meet the high demands of customers such as ARTiBack, Saalemühle has consistently focused its operations on quality and flexibility. And like ARTiBack, Saalemühle is also economically successful with this orientation. Released from the state assets of the former German Democratic Republic in 1992, the new owners have built up one of the most efficient mill groups in Germany with seven sites in operation today. The annual grinding volume of Saalemühle is over 500,000 metric tons, while that of the Group is 1.7 million metric tons. Saalemühle uses a wide range of Bühler products in its plants.

Saalemühle’s economic success does not come by chance, but is the result of three factors. The first recipe for success is innovation. For example, the millers at Saalemühle implement the market requirements in terms of automation and digitalization into the corresponding programs themselves with their own team.

Hygiene management is resource-efficient due to switching from the industry-standard annual fumigation and instead keeping insect infestations at a worry-free level year-round. Saalemühle mitigates potential condensation problems with special aspiration and ventilation concepts, meaning that the company can even dispense with stainless steel.

The company is particularly innovative in terms of its knowledge of bakery products and products for the food industry. The specialists carry this expertise across to agriculture and, with the right formulations, reduce waste, increase plant performance, and minimize the use of additives – if they can’t do without them altogether.

INFO**ARTIBACK**

Founded in 2016, the company processes around 80 metric tons of flour per day into 50 different products – and combines industrial processes with traditional baking. Only natural ingredients are used in the doughs, and chemical additives are consciously avoided. The doughs are allowed to rest for up to 36 hours before being machine-rolled, shaped, baked, frozen, and packaged. This places the highest demands on the flour, which Saalemühle meets as part of a close partnership.

The second recipe for success: The millers are at the center of the processes. “At our mill, the millers call the shots,” says Michael Haag, Operations Manager at Saalemühle. They are the nucleus of all processes, starting with customer contact, the purchase of raw materials, the operation of plants and lastly, with investment decisions. “Contrary to many other opinions, in our business, the trained miller must take the central role,” Haag explains. From his perspective, to use the increasing investments in the mill beneficially, a miller who thinks about and understands the big picture is required. “Otherwise, it will hardly be possible to generate a competitive advantage.”

Since these trained millers are not exactly in plentiful supply, the topic of training and continuing education plays a central role at Saalemühle, which is the third recipe for success. The six millers and three apprentices at Saalemühle initially make the most of the standard training and further education opportunities on the market – the dual training system in Germany. “We have highly recognized dual vocational training in Germany,” Haag explains.



At ARTiBack, the doughs may rest for up to 36 hours.

“AT OUR MILL, THE MILLERS CALL THE SHOTS. CONTRARY TO OTHER OPINIONS, IN OUR BUSINESS, THE TRAINED MILLER MUST TAKE THE CENTRAL ROLE. OTHERWISE, IT WILL HARDLY BE POSSIBLE TO GENERATE A COMPETITIVE ADVANTAGE.”

MICHAEL HAAG

Operations Manager at Saalemühle

Foundational knowledge is deepened at an early stage in the internal training center founded in 2020 and adapted to the needs of Saalemühle. After that comes work experience. “We support interested, experienced tradesmen and women if they want to gain additional qualifications with further training,” he says. “With annual internal training courses on current topics, we provide ongoing training in our own training workshop.” At Bühler, too, the topic of training and continuing education has been deeply rooted for more than a hundred years. To find out more read “Investing in millers” on page 81.

Young miller Jonathan Gutting has already internalized the principle of continuous learning. Even now, as he studies business administration in Vienna,

he is planning the next phase of his education. “My next step is to get more involved with food engineering and biochemistry,” he says. Further study programs are already a matter of course. So, out with the truck driver’s license, in with a lifelong learning approach and a diploma. “Being able to apply all of my knowledge as a miller is satisfying,” he says.

VIDEO



Watch the video about Saalemühle and ARTiBack here.

INVESTING IN MILLERS

Helping millers to master the challenges of an increasingly complex industry means offering a wide range of training that suits customers' needs around the world. That's what Bühler's milling academies do.

“An orchestra must have three elements if it is to produce good music: the conductor, the instruments, and the musicians. It's the same with a mill,” explains Peter Striegl, Head of the Grain Innovation Center and Milling Academy at Bühler. “In the mill, when management, processes and machines, and millers and maintenance crews work together, you get a great outcome.”

This is the fundamental belief behind Bühler's milling schools. There are four across the world: the Milling Academy in Uzwil, Switzerland; the African Milling School in Nairobi, Kenya; the Training Center in Wuxi, China; and courses on offer at the Food Application & Training Center in Minneapolis, US. Bühler also supports schools run with partners in the US, Mexico, India, and the UK.

In addition, the Swiss School of Milling, founded in the late 1950s by Dr. René Bühler, offers milling education in St. Gallen, Switzerland. “We offer training to our customers around the world, in their own language,” says Striegl. “We also send our trainers to the customer's site, so that they can train on the job with the equipment they use every day.”

The core courses on offer cover process technology for milling wheat, durum, oat, corn, and pulses, as well as operating color sorters. There are courses in mechanical and electrical maintenance, and advanced plant automation, as well as courses for operation management and senior executives. “In the past, most mills were owned by families who handed down knowledge from generation to generation. Today, many are owned by companies and run by professional managers, so we also address the needs of new managers coming into the industry,” says Striegl. Beyond learning skills and expertise, the training is also about opening up new ideas and cre-



Milling for Executives, August-September 2022 class: The African Milling School offers many courses, including short courses for industry leaders to teach them milling basics and the key performance indicators that drive the business.

ating energy. “We have to tackle the idea that milling is an old-fashioned profession. Today's millers need expertise in many disciplines, from product quality, food safety, and sustainability to market trends, digitalization, and automation. Our job is to support them in that as well as helping them to run their mills as efficiently as possible.”

Most critically, for young talent the training is a gateway into a career that inspires passion and loyalty. Perhaps that is why milling has a high retention rate for apprentices. “It may be difficult to bring young people into this industry,” says Striegl. “But once they get the milling bug, they tend to stay.”

DID YOU KNOW...?

... that at Networking Days 2022, over **1,000 delegates including our customers and partners** came to Uzwil, Switzerland to discuss how best to accelerate impact together in order to ensure a sustainable future for humanity.

... that they represented companies from **95 countries** that, together, feed 4 billion people and provide mobility for 2 billion.

... that **30 speakers from across industries and regions** delivered insights and inspiration on topics ranging from leadership to solutions that will shape the future.

... that Bühler **announced 13 new partnerships and projects** during the event.

... that **media representatives came from the US, South Africa, Switzerland, Italy, Germany, France, Singapore, and the UK.** There were media briefings on topics from CO₂ reduction to investing in the future of food.

... that over the course of the event there were **25,319 interactions** on social media.

... that **32 guests came to the studio to give interviews on 19 different topics**, which are being published on Bühler's social media channels as part of the "Accelerating Impact Series".

Follow us on social media so you don't miss them!

... that the environmental impact of Networking Days was an estimated **1,300 metric tons of CO₂e.** That figure includes all the flights of the participants. **It was compensated using projects on Restor and with Climeworks.**

... that the **environmental impact of over 60 technologies** was quantified for the event.

... that the trend toward vegan was evident as **4,300 vegan dishes** were consumed, compared to 7,250 meat dishes.

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NETWORKING DAYS: A SPRINGBOARD FOR GREAT COLLABORATIONS

COLLABORATION is a much-used term. Easy to say, but difficult to live up to, it has become a prerequisite for future success, whether for major multinationals, start-ups, academics, investors, or NGOs. To create economically successful businesses that mitigate climate change, protect and restore biodiversity, and reduce the gap in wealth distribution on our planet, effective collaboration across value chains, industries, and national borders will be critical.

The Bühler Networking Days had collaboration at its core. With 30 speakers to inspire us, 50 invited start-ups, 13 breakout and discussion sessions, six academic institutions, and over 1,000 attendees from across the world, opportunities for new and impactful partnerships abounded.

As part of this journey, Bühler announced several new partnerships that enable both partners to serve the market more effectively and earlier than they could alone. An area of high importance for transforming our food systems is sustainable proteins, particularly, the next generation of proteins and food and feed ingredients that come from bioreactors. Our new joint venture, Eridia, is with ZETA, a bio-pharma engineering company, and delivers engineering and process design for precision fermentation and cellular agriculture. This area sparks much debate but has the potential to significantly reduce the land burden and carbon footprint of protein production. Jellatech, producing collagen, and Pearlita, producing oysters are further examples of how our food system can evolve sustainably.

Meanwhile, our partnership with Endeco, which includes a new pilot facility, enables us to bring full process design and solutions from field to meat or dairy analogues. Plant-based alternatives are becoming commonplace in supermarkets and interest is growing everywhere, as was demonstrated by start-ups from Nigeria and India, as well as the range of Asian companies presented by Big Idea Ventures.

Evolving to a more circular economy was another core topic. We announced our partnership with Vyncke, a company optimizing organic side streams as fuel for process plants. Together we can support customers in optimizing energy requirements, maximizing side stream utilization, and increasing circularity in processing plants.



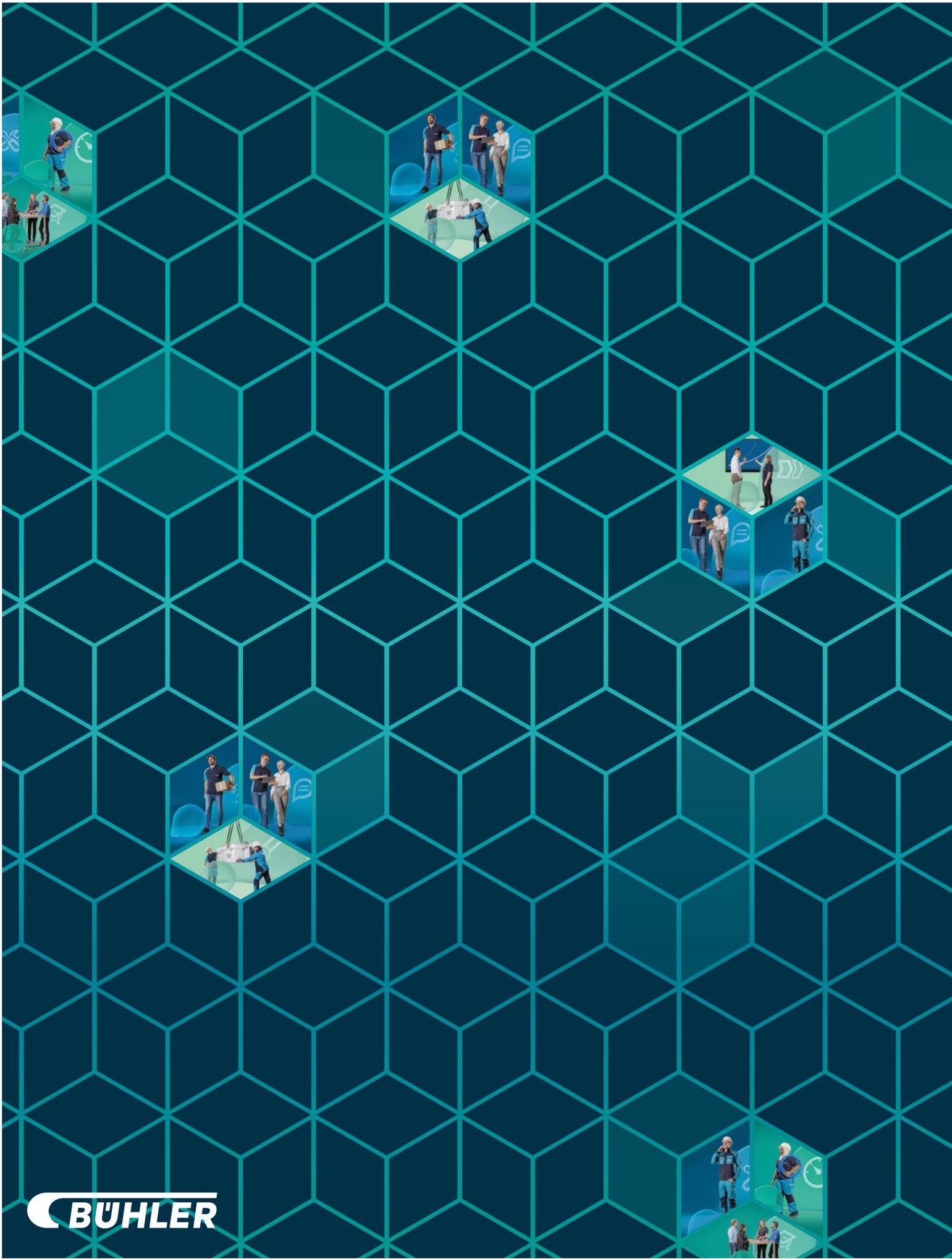
Ian Roberts, CTO

On the topic of decarbonization, Clime-works provoked great interest with their technology, while Restor, which focuses on biodiversity protection and restoration, became the first contact for many attendees to start their company's biodiversity journey.

With One Young World, the World Business Council for Sustainable Development, Partners in Food Solutions, and numerous educational leaders present, the role of industry leaders in creating partnerships that will bring positive impact while driving healthy economic growth and employment was ever present.

Does the Bühler Networking Days work to facilitate collaboration? One CEO told me: "We are working with five new partners that we met for the first time at the Bühler Networking Days."

Anecdotal this may be, but it suggests we are moving in the right direction, and it has prompted us to think about how we track and maintain progress between now and our next Networking Days in 2025. You will hear from us soon on how we plan to keep the inspiration and collaboration opportunities high between Networking Days events and look forward to sharing your great examples of building sustainable businesses to inspire us on our journey.



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