

FACTS & FIGURES 2019

THE  
FUTURE  
IS NOW!

Innovations for a **better world.**

**BÜHLER**



Stefan Scheiber, CEO, and Calvin Grieder, Chairman.

# THE FUTURE IS NOW!

## Dear customers, colleagues, and business partners,

Any strategy is only as good as the operational implementation it precedes. In this sense, 2019 was a confirmation of our fundamental orientation in several respects.

First, this applies to the acquisition of the Austrian Haas Group at the beginning of 2018. Our goal was to form a third strategic pillar together with the leading company for wafers, biscuits, and cookies. The Consumer Foods segment, which was formed in 2019 from Haas and the corresponding Bühler business areas, is in a position to cover our customers' integrated processes and value chains and thus to develop and offer comprehensive solutions. This strategic step was rewarded by our customers. We have won market share on the basis of this new solution competence. We were able to complete the integration of Haas earlier than planned, and we fulfilled the business plan underlying the acquisition.

Bühler Group's business performance was stable in a volatile market environment. While the turnover of the food and feed business continued to grow, Advanced Materials had to cope with a decline, mainly caused by the current weakness of the global automotive industry and ongoing international trade conflicts.

Second, our multi-pillar strategy has proven its worth under difficult conditions. Overall, Bühler's order intake reached CHF 3.1 billion (-4.6%), turnover was CHF 3.3 billion (-0.5%), and EBIT increased to CHF 248 million (+7.5%), with an EBIT margin of 7.6% (previous year: 7.1%).

Third, our focus on innovation and sustainability was met with impressive approval at the opening of our CUBIC innovation campus and during the Bühler Networking Days 2019 in August. More than 800 executives from customers, industry partners, scientific institutions, start-ups, and NGOs from all over the world came to Uzwil for several days to work with us on developing sustainable solutions for the future. The challenges are enormous, and so is the potential of new technologies. As an industry, we have a responsibility to respond to these pressing threats with new solutions and concepts. Therefore, we have applied the credo "The future is now" to our 2019 Annual Report. Our key factors for success – now and in the future – are people, innovation, and collaboration.

We wish to express our sincere gratitude to our customers, partners, our workforce and their families, and our owners. Our success and our ability to feel good about all that we have achieved is due to your commitment and trust. We look forward to working closely with you for years to come.

Yours faithfully,



**Calvin Grieder**  
Chairman of the Board



**Stefan Scheiber**  
Chief Executive Officer

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## INNOVATIONS FOR A BETTER WORLD

2019 marked a milestone in the history of Bühler. With the opening of the CUBIC innovation campus, the Bühler Networking Days in Uzwil, and the new partnerships formed, the company has expanded its innovation ecosystem, while the operative business proved its robustness under difficult conditions.

The development of sustainable technologies and process solutions in close collaboration with customers, industry partners, scientific institutions, and start-ups was taken to a new level in the 2019 business year. As a driving force behind this innovation ecosystem, Bühler resolved to elevate its sustainability targets – striving to reduce energy, water consumption, and waste by up to 50% in the value chains of its customers by 2025. Recognizing the increased urgency presented by global climate and environmental challenges, Bühler is committed to transforming them into profitable, quickly growing businesses. Bühler's position and market differentiation have been further expanded and strengthened with these initiatives.

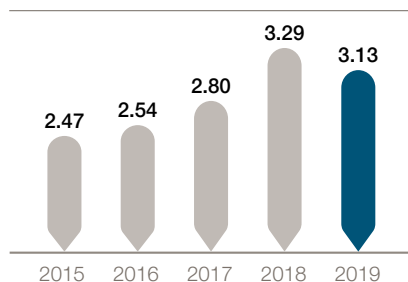
Operationally, Bühler's strategic positioning as a provider of industrial solutions with three segments proved its worth in 2019: In an increasingly challenging and volatile environment, the good performance of Grains & Food (GF) and Consumer Foods (CF) was largely able to balance out the declines in Advanced Materials (AM). On the Group level, the

incoming orders and turnover remained stable, while profitability was further increased. A noteworthy highlight is the successful and ahead-of-schedule integration of the Austrian Haas Group following its acquisition in 2018, and the formation of the new Consumer Foods business in January 2019. In 2020, Bühler plans for a stable and positive business development.

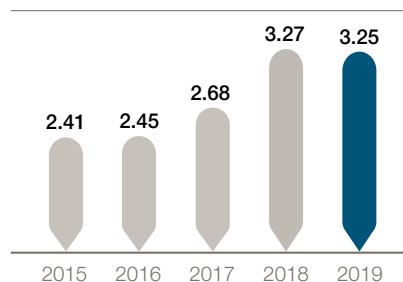
### Increased profitability with stable volumes

The course of the business development in the segments varied widely. While order intake for GF continued to grow at CHF 1.8 billion (+5.2%), for CF it declined slightly to CHF 775 million (-1.7%), and AM had to absorb a decline of 32.2% in order intake to CHF 488 million, largely due to the automotive industry. Overall, order intake for the Group amounted to CHF 3.1 billion (-4.6%). The same picture emerges with regard to turnover. On the Group level, Bühler's turnover was CHF 3.3 billion (-0.5%). With turnover of CHF 1.8 bil-

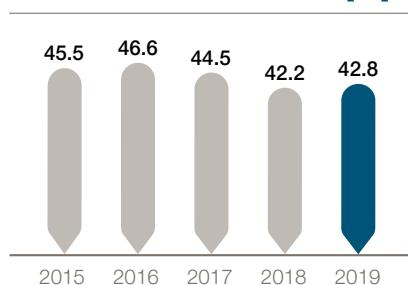
Order intake  
(in billion CHF) **-4.6%**



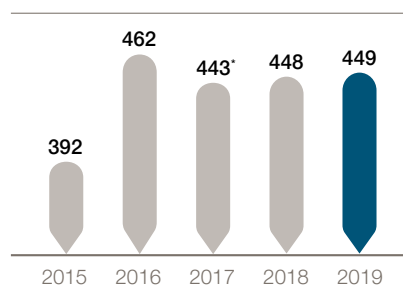
Turnover  
(in billion CHF) **-0.5%**



Equity ratio  
(in %) **+0.6pp**



Net liquidity  
(in million CHF) **+0.3%**



\* Excluding corporate bond of CHF 420 m.

lion (+0.9%), GF demonstrated robustness. Getting high levels of orders into turnover in a timely manner remains a key focus. CF turnover was CHF 774 million (+2.5%). At CHF 649 million, the turnover of AM dropped by 8.0%. The order backlog on the reporting date was CHF 1.8 billion (previous year: CHF 1.9 billion).

Along with this divergent course of business, there was also a shift in regional development. While Asia and Europe drove growth in the past year, in 2019 North America and Middle East & Africa took over this role. For the first time in years, Bühler recorded a standstill in China due to market saturation and tariff conflicts. Regardless, its geographic bandwidth remains balanced. With regard to turnover, Europe makes up 30%, Asia 31%, North America 16%, Middle East & Africa 14%, South America 6%, and South Asia 3%.

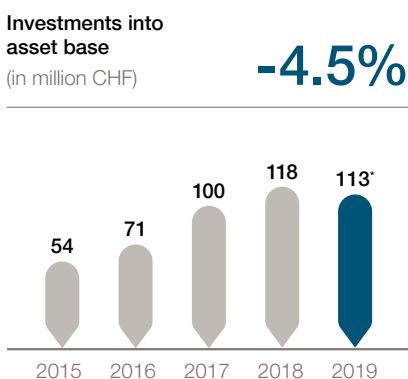
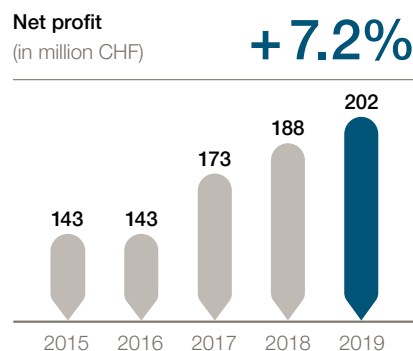
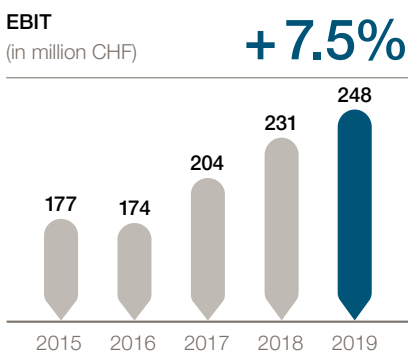
Structurally, Bühler was able to further improve the breadth of its portfolio in 2019. Customer Service (CS) turnover grew by 2.9% to CHF 694 million, and the Single Machine Business (SMB) turnover decreased by 4.0% to CHF 285 million. Together CS and SMB generated total turnover of CHF 979 million, representing a 30% share of total Group turnover (previous year: 30%). The e-commerce platform myBühler made a substantial contribution to the CS business. In 2019, the number of active customers increased from 4,000 to 5,500, the orders through the system

from 8,400 to 13,000, and the revenue from CHF 25 million to CHF 41.5 million. Strategic investments in our infrastructure and research and development (R&D) remained at a high level. The expenses for R&D were increased to CHF 149 million, that is an increase relative to Group turnover of 4.6% (previous year: 4.4%). This is in line with Bühler's strategy to be an innovation leader in its industries.

### Financially sound

By consistently managing resources and costs, Bühler succeeded in increasing profitability while maintaining the same volume. EBIT rose by 7.5% in absolute terms to CHF 248 million, corresponding to an EBIT margin of 7.6% (previous year: 7.1%). The leap in profitability in CF, with an improvement in EBIT of over 50%, is particularly noteworthy. With a tax rate of 19.5% (previous year: 20.1%) and a financial result of CHF 2.4 million (previous year: CHF 4.6 million), net profit grew by 7.2% to CHF 202 million (previous year: CHF 188 million).

From a healthy basis, Bühler's financial position remains solid and strong. Investments in infrastructure were reduced to CHF 113 million (-4.5%). Operating cash flow declined by 18% to CHF 166 million. Net liquidity remained high at CHF 449 million (+0.3%). The equity ratio grew slightly to 42.8% (previous year: 42.2%).



\* Excluding changes in accounting standards and others.



More about the 2019 business year

## Grains & Food

### Order intake

CHF **1.8 billion** **+5.2%**

### Turnover

CHF **1.8 billion** **+0.9%**

## OPERATIONAL ACTIVITIES

### Grains & Food

Grains & Food (GF) continued on its successful course in 2019, with growth in all four business units and notable profit from numerous large projects. Order intake grew by 5.2% to CHF 1.8 billion, and turnover increased by 0.9% to CHF 1.8 billion. With the introduction of numerous innovations, GF further expanded its position of technological leadership. To develop highly efficient packaging solutions, GF initiated a strategic partnership with the Canadian company PremierTech.

In 2019, Milling Solutions was able to win large global projects, including Ardent Mills (US), Barilla (Italy), Fahem (Yemen) and City Group (Bangladesh) – and thereby further expand its already strong market position. The first order for the new, revolutionary generation of mills – the Mill E3 – made by British customer Whitworth Brothers Ltd., was a milestone. With a more compact, modular design, new components and full digitalization, the Mill E3 saves about 10% in energy and significantly reduces construction costs and installation time. The start of production for the first Mill E3 is planned for mid-2020. The digital services launched at the Networking Days 2019, held in August in Uzwil, Switzerland, met with a positive response, especially the Yield Management Service (YMS) and its associated interactive dashboard. For one German customer of YMS, yield was increased by up to 2% with the help of this digital solution.

Value Nutrition also saw strong growth in most application areas, particularly in pet food, cereals, and pasta. Its solutions for manufacturing plant-based meat alternatives gained significance. With the market introduction of a single-screw extruder, Value Nutrition was able to supplement its product portfolio and is now in a position to offer the entire range of processing technologies.

Based on its leading innovations, Digital Technologies recorded high growth for optical sorting machines, especially for nuts, frozen fruits, and vegetables, as well as for plastic recycling. The business unit was honored with the Queen's Award for Enterprise for the seventh time since its first win in 1968. The United Kingdom's most prestigious innovation

award was received in recognition of the development of a unique camera technology used in sorting machines capable of recognizing the subtlest color and shading contrasts in materials and foods, thereby significantly increasing detection rates for foreign materials or contaminated foods. Digital Technologies also introduced Laatu, a new technology for microbial reduction in dry foods that does not introduce heat, water, chemicals, or radioactive sources, to make foods safe. It also reduces waste, energy, and other natural resources.

Grain Quality saw positive growth in all areas in 2019, including malting, brewing, rice, and storage. Many large malting projects went to Bühler, confirming its global market leadership. With new process solutions to increase yield, it was possible to reinvigorate the brewery business. In the rice business, Bühler saw strong growth primarily in Southeast Asia and secured a foothold in China with important key contracts. The business unit recorded its first orders for silos and conveyor belts related to China's Belt and Road Initiative, a mega-project for infrastructure. Grain Quality also benefited greatly from joint projects with other business units.



More about  
Grains & Food

### Consumer Foods

The Consumer Foods (CF) segment was established at the beginning of 2019 from the acquired Haas Group and the associated business areas at Bühler and was operational in 2019 as the third strategic pillar. In a positive environment, the strengths of the new market presence were demonstrated in just the first year of its existence. The CF segment decreased in order intake by 1.7% to CHF 775 million, and turnover increased by 2.5% to CHF 774 million. The segment was able to significantly improve profitability.

In 2019, the Haas business units were rebranded and integrated with the corresponding Bühler businesses into the Bühler Consumer Foods business segment. The goal was to offer complete process solutions under the Bühler brand for the manufacturing of items such as wafers, cookies, and

## Consumer Foods

### Order intake

CHF 775 million **-1.7%**

### Turnover

CHF 774 million **+2.5%**

## Advanced Materials

### Order intake

CHF 488 million **-32.2%**

### Turnover

CHF 649 million **-8.0%**

bars. The integration was concluded ahead of schedule. The consumer foods market and its customers responded extremely positively to the merger. The Egyptian customer NSPO ordered four complete wafer and cookie lines in January, not least thanks to Bühler's ability to provide fully-integrated solutions. The close collaboration between the GF and CF business segments led to more orders from this customer. Over the course of the year, NSPO ordered a mill, a pasta line, and a chocolate line, and the extension of one wafer and one biscuit line each with a chocolate coating line.

Similar success was achieved with the Italian customer Ferrero, which put an integrated wafer bar line into operation in October. Bühler's complete competence in the areas of wafer, creme, chocolate, bar, and coating technology were fully deployed for this customer. The 2019 business year was also characterized by the introduction of numerous innovations most of which, were aimed at increasing sustainability through energy efficiency, reducing waste, and raising productivity. The new SWAKT-ECO oven saves up to 25% of energy in waffle manufacturing and reduces emissions by up to 90%. A newly developed process for producing edible to-go coffee cups made from waffle dough was developed to reduce the use of single-use plastic.



More about  
Consumer  
Foods

### Advanced Materials

After five years of uninterrupted growth, Advanced Materials (AM) had to accept a decline in order intake and in turnover due to the global slowdown and saturation in its key markets – automotive and precision optics. Order intake fell by 32.2% to CHF 488 million, and turnover dropped by 8.0% to CHF 649 million. Due to the order backlog in the previous year and timely, consistent cost management, the segment remained satisfactorily profitable. AM used the generally tense market situation to assert its position as the market and technology leader by introducing several forward-thinking innovations.

Die Casting was heavily affected by the weakness in the global automotive industry, most notably from the decline in China. About 80% of the business for the unit stems from this industry. It was therefore decided to maintain market and technology leadership with innovations and improve the range of services.

Die Casting introduced its new modular machine platform Fusion in Düsseldorf, Germany, at the GIFA trade show, making a resounding argument with 1,400 tons of clamping force. At the center is the digital die-casting cell, consisting of the machine itself, supplemented with the integrated cell control system Smart CMS and additional digital services such as downtime analysis and maintenance forecasting. In Brescia, Italy, the business area opened a new service center for retrofitting machines. In addition, Die Casting succeeded in anchoring itself in new, non-automotive end markets, for example with orders in regard to 5G mobile communications.

Leybold Optics was also affected by the decline. In precision optics for mobile devices, there was a delay in investment due to the effects of international trade conflicts. In the area of coating systems for architectural glass, a slowdown occurred due to saturation after several strong years. In the case of coating systems for front and rear lights, the slowdown in the automotive sector was noticeable. The ophthalmics business with coating systems for lenses held its ground. Innovation highlights included the introduction of the Helios 1200 precision optical filter for coating 12-inch semiconductor wafers, and Leybold Optics' market entry into ion beam sputtering technology for applications in high-power lasers and optical telecommunications.

In Grinding & Dispersing, sales of single machines remained solid in 2019. For paint production systems, the United States punitive tariffs on key chemicals from China led to a significant slowdown.

Good progress was made in building up the business of systems for electric battery manufacturers. Bühler has installed over 20 production lines with a mixing capacity of half a gigafactory (16 GWh).



More about  
Advanced  
Materials



## FOCUS ON SUSTAINABILITY

It is obvious that global challenges regarding climate change and mobility are accelerating and becoming increasingly urgent. Climate change, the protein gap, loss of biodiversity, and population growth – all will have a greater impact if we don't act now as individuals, businesses, and industries to drive change. In 2018, the United Nations Intergovernmental Panel on Climate Change (IPCC) reported the consequences of 1.5°C global warming above pre-industrial levels compared with a 2°C increase. If we do not stay within the 1.5°C threshold, the risks of floods, extreme heat, food scarcity, and poverty for hundreds of millions of people will increase.

For this reason, Bühler has raised its own sustainability targets in 2019. Bühler aims to reduce energy and water consumption, as well as waste in customers' value chains by 50% by 2025. It is Bühler's goal and corporate purpose to transform these urgent challenges into quickly growing and profitable businesses in alignment with its purpose of "Innovations for a better world".

No single company can address global challenges on its own. On the contrary: Only through close cooperation can the necessary solutions be developed and scaled in a timely manner. For this reason, Bühler broke ground on a new epicenter for its collaborative innovation ecosystem in Uzwil, Switzerland, in September 2017. After 20 months of construction, and an investment of more than CHF 50 million over three years, the CUBIC and the associated application centers were opened in early 2019 – and with it, a new chapter in Bühler's corporate history started.

Bühler is strengthening its model of collaborative innovation and education with the CUBIC, a total of 25 application centers for joint development with customers and start-ups around the world, more than 7,800 continuing education courses, about 600 apprentices at 25 locations, and dozens of partnerships with universities, industrial partners, start-up accelerators, and NGOs.

### Opening the CUBIC innovation campus

The CUBIC is integrated into the Uzwil location so that it forms a bridge between development, engineering, and design teams, eight modernized application centers, and production. As a result, customers, start-ups, industry and research partners can develop solutions more quickly and efficiently to reach market readiness. The CUBIC specifically promotes new methods of learning for training and continuing

education. Here, working apprentices and researchers, and both young and experienced employees work together in project teams across business units, and with a strong focus on digital solutions. The campus embodies the innovative spirit and inclusive culture of the company.

The three-story CUBIC facility is itself an example of sustainability and innovation. The building consumes 35% less energy than a building of similar size. Its smart, electrochromic glass façade was manufactured on glass-coating machines from Bühler Leybold Optics. The innovation campus is certified with a Gold label from LEED (Leadership in Energy and Environment Design).

### Creating tomorrow together

Bühler once again invited industry leaders, partners, customers, scientists, and start-ups to convene in Uzwil and join its Networking Days 2019 event. The motto was: "Creating tomorrow together". The first Networking Days in 2016 focused on food, while at the 2019 event, food and mobility of the future were in the spotlight.

At the heart of the presentations, discussions, and exhibits was the question of how to provide the projected population of 10 billion people in 2050 with sustainable nourishment and mobility. The 800 attendees discussed the need for increased collaboration across sectors and industries to drive the transformation needed to address the climate crisis.

The attendees not only heard from Bühler leaders, but also the views of knowledgeable authorities from broad fields of expertise, including Dr. Gro Harlem Brundtland, former Prime Minister of Norway and advocate for sustainability; and Stefan Palzer, Chief Technology Officer of Nestlé; Patrick Dupin, CEO of Saint-Gobain Northern Europe; and Francois Pienaar, who led the South African national rugby team to a world championship title in 1995 as team captain. Sunny Verghese, the co-founder and CEO of Olam International as well as President of the advisory board to the World Business Council for Sustainable Development (WBCSD) spoke of the need for companies to work together to leave a better world to future generations, and John Harthorne, founder of the start-up accelerator MassChallenge, expressed the need to pave the way for innovators.

The Networking Days 2019 participants represented companies that manufacture food for 4 billion people every day and contribute to the mobility of about 1 billion people. The



Böhler employees form “TOP”; our new corporate values that stand for Trust, Ownership, and Passion.

group as a whole was in agreement that continuing the status quo is not an option for dealing with today’s global challenges, and that broadscale collaboration is vital to making the food and mobility industries more sustainable.

### With positive energy into the future

Another milestone in 2019 was the refinement of our corporate values to TOP: Trust, Ownership, and Passion. The global challenges and risks that we face today have become more acute, and the world is changing quickly. Taking the TOP values as the guideline, Böhler’s ambition is to transform the global challenges it faces into sound business opportunities. Values play a crucial role for a company’s success and they set the foundation for the company culture. With the TOP values as a framework for behavior, Böhler aims to profitably grow its businesses, and at the same time, contribute to a sustainable world, which gives future generations the same chances to live and develop as today’s societies.

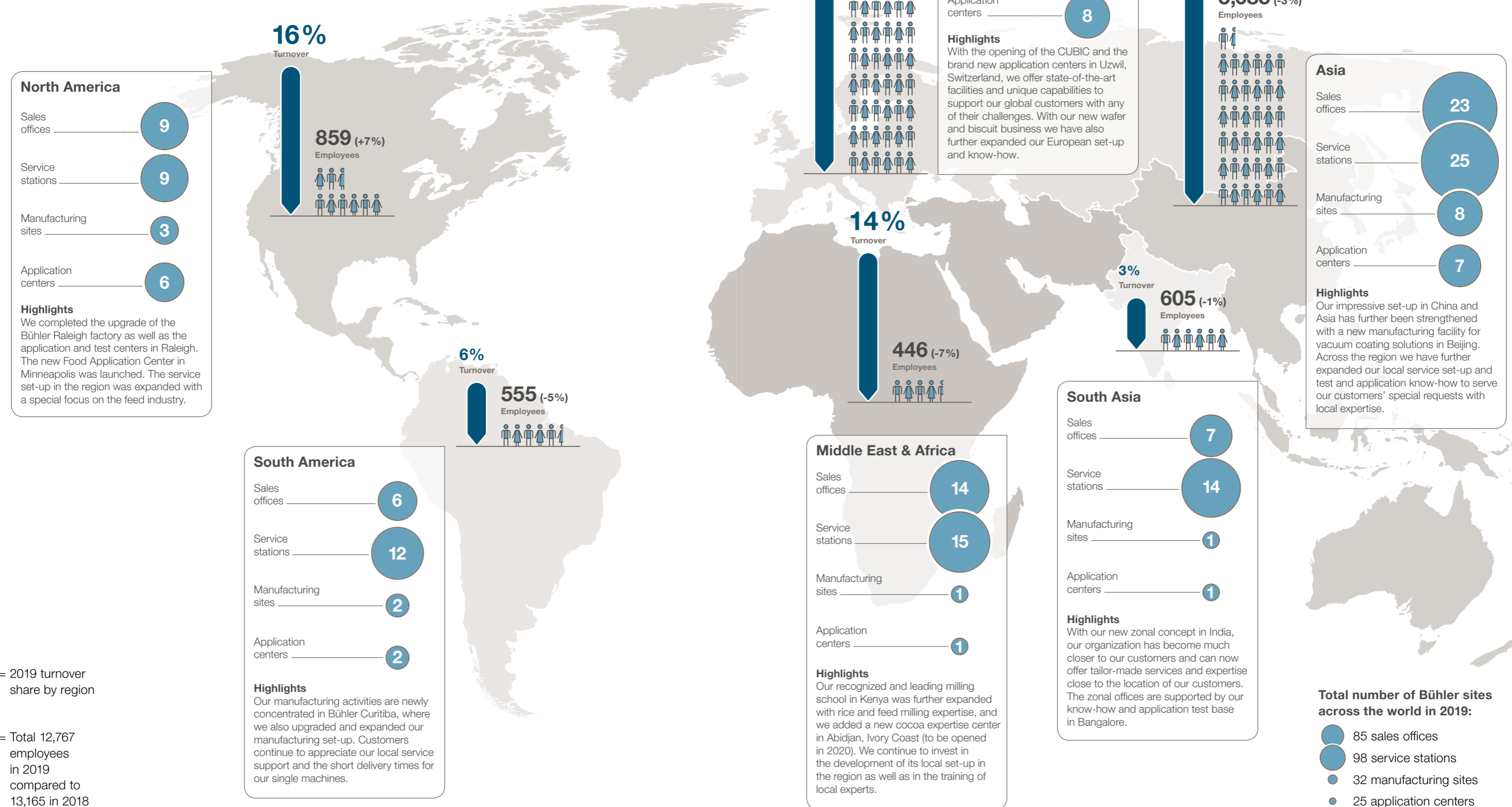
### Outlook

Looking at the current fiscal year, the framework of the global economy looks bleaker. The trade conflict between the US and China, Brexit, and political unrest in Venezuela and Chile, are leaving their mark on global growth prospects. Starting in the second half of 2018, Böhler noted greater reluctance for large projects. The upheavals created uncertainty in the industries, such as on the issue of electromobility.

On the other hand, many new business opportunities were created as a result of China’s Belt and Road Initiative – an ambitious global development program for infrastructure – and there were positive developments in many African countries. Both resulted in the necessity for developing sustainable solutions for nutrition and mobility. With its global positioning, a strong foothold in Asia, and a growing innovation ecosystem, Böhler is well positioned to benefit from these opportunities. In 2020, Böhler plans for a stable and positive business development.

# IN THE REGION, FOR THE REGION

Bühler has systematically localized its resources and offers manufacturing sites, service stations, sales offices, R&D facilities, and application and training centers across 140 countries.



- Total number of Bühler sites across the world in 2019:**
- 85 sales offices
  - 98 service stations
  - 32 manufacturing sites
  - 25 application centers

# GRAINS & FOOD

## At a glance

We want everyone to have access to healthier nutrition. As versatile the technologies, process solutions, and applications of Grains & Food may be, this is their common focus – no matter whether it is to process grains, rice, corn, or pulses. Bühler customers provide over 2 billion people with staple products.

We want there to be enough to eat while also reducing food waste. We want to preserve resources such as energy and water. To accomplish this, we are using more and more digital technologies.

Grain Quality & Supply offers reliable cleaning, storage, and transportation solutions for raw materials. Additionally, this business area also delivers complete solutions for rice and malt production. Milling Solutions combines the ideal grinding and processing of grains and pulses with the highest of hygiene standards. Value Nutrition enables the energy-efficient, reliable production of pasta, breakfast cereals, animal feed, pet food, and aqua feed using extrusion and drying technology. Here, meat substitute products made of textured vegetable protein are playing an ever more important role. With optical sorting, and cloud-based monitoring solutions, the Digital Technologies business area ensures that harmful substances are removed during processing and that the safety of food and feed is documented.

All business areas offer process solutions for the entire value chain: from harvested grain to flour, breakfast cereals, pasta, or animal feed. Add to that a global network of service, training, and application centers, enabling customers to optimally operate our systems.



### Grain Quality & Supply

Grain Quality & Supply provides high-quality, safe processing solutions for grain logistics, cleaning and storage, malting and brewery, and rice. It aims to increase efficiency, improve traceability, and reduce food loss.



### Milling Solutions

Milling Solutions delivers state-of-the-art process technology for transforming raw materials such as wheat, rye, oats, corn, and pulses into high-grade flour and semolina products.



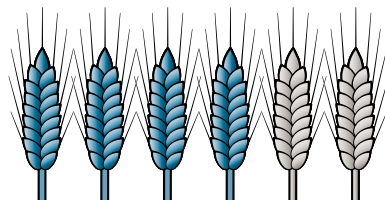
### Value Nutrition

Value Nutrition is the global solution and technology partner for producers of animal feed, pet food, aqua feed, pasta and noodles, vegetable oil, cereals, and snacks.



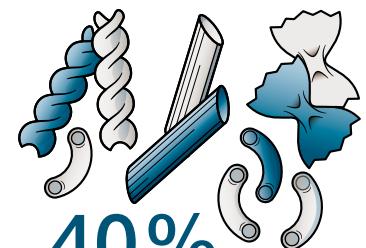
### Digital Technologies

Digital Technologies offers sorting machines, industrial measuring machines, sensors, control systems, and service-driven products for the food and non-food processing industries.



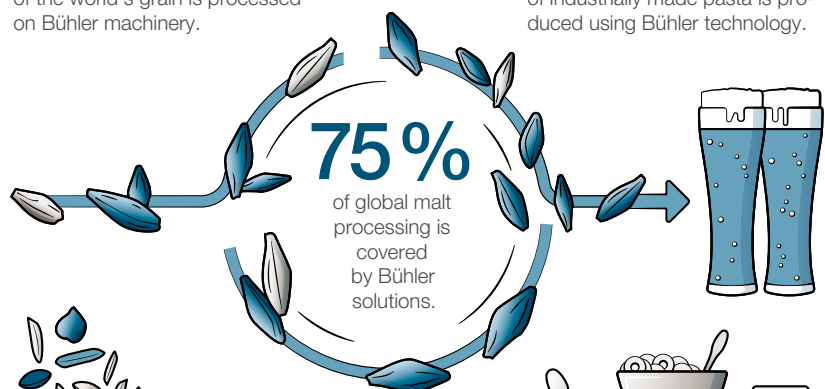
**65%**

of the world's grain is processed on Bühler machinery.



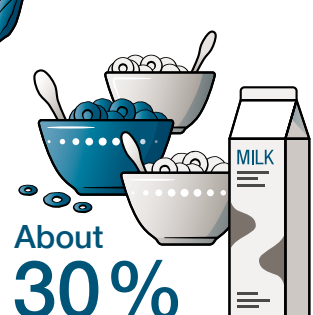
**40%**

of industrially made pasta is produced using Bühler technology.



**30%**

of global rice and pulse production is covered by Bühler solutions. Rice is a staple food for 3 billion people.

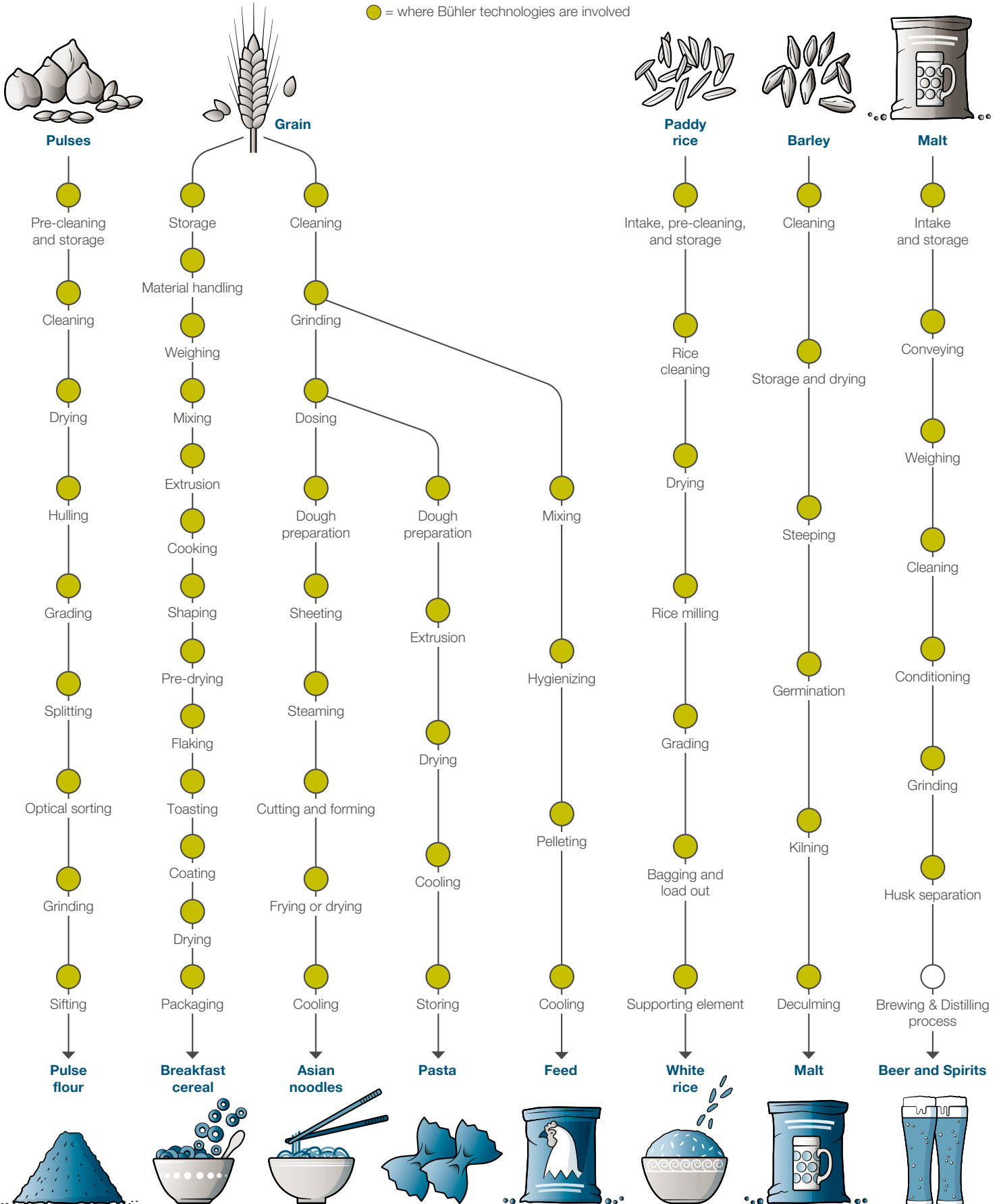


**About 30%**

of all breakfast cereals are processed with Bühler technologies.

How various raw materials become high-quality food products:  
Seven examples of Bühler Grains & Food process technologies

● = where Bühler technologies are involved



# CONSUMER FOODS

## At a glance

We want all people to be able to enjoy sweets, baked products, nuts, chocolate, and coffee in good conscience. This means transforming safe raw materials into optimized recipes. It also means carefully handling raw materials, supporting sustainable value chains, reducing waste, and increasing energy efficiency throughout production.

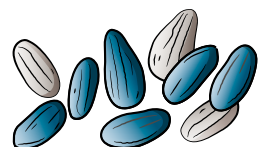
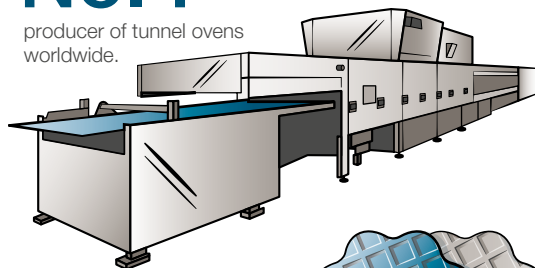
Consumer Foods is all about end products. Whatever the product, from crunchy ice-cream cones, to chocolate, cookies, wafers, pralines, and snacks, quality is at the forefront. Our Bakery business brings together expertise in processing flour, sugar, creams, nougat, chocolate, marshmallow, dairy, and non-food products as well as premixing flours, cereals, and spices. Wafer offers tailor-made solutions for baking, filling, and cutting. Biscuit is specialized in processing cookies and crackers. Chocolate & Coffee is specialized in cleaning, roasting, grinding, and finishing raw materials, while Confectionery is responsible for shaping liquid chocolates into pralines and bars as well as coating wafers and cookies with chocolate.

The joy these business units can offer with integrated solutions shines when doughs, nuts, and chocolate are combined into many different end products. Close collaboration with Grains & Food results in more seamless process chains starting with grains, incorporating grinding and extrusion, and ensuring efficiency, food safety, and transparency with visual sorting and digital services.

	<b>Bakery</b>	Bakery offers process and handling solutions for dry and liquid ingredients for a range of consumer products for the baked goods, premix, confectionery, and dairy industries.
	<b>Wafer</b>	Wafer is the foremost solution provider for flat or hollow wafers, wafer sticks, cones, and soft waffles. Put your trust in the world market leader that unites quality, tradition, and progress.
	<b>Biscuit</b>	Biscuit is the specialist for cookies, cakes, crackers, and more, providing machines with shorter baking terms that consume less energy and provide full control over dough moisture content.
	<b>Chocolate &amp; Coffee</b>	Chocolate & Coffee provides complete solutions for processing cocoa beans to high-quality chocolate masses and develops coffee and nuts into tasty end products.
	<b>Confectionery</b>	Bühler Confectionery offers unique solutions to mould chocolate in any shape and form. It offers technologies to produce cereal, protein, fruit and nut bars, plain or enrobed with chocolate.

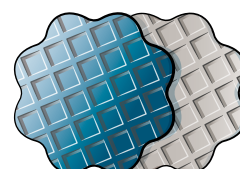
**No. 1**

producer of tunnel ovens worldwide.



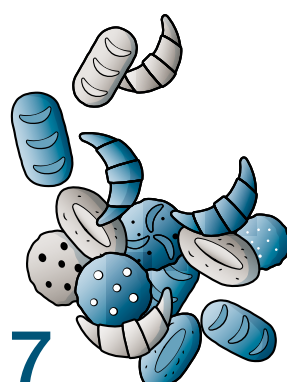
**65%**

of cocoa beans and nibs are roasted and processed with Bühler roasting technology.



**55%**

of all waffles and wafers are produced using our solutions.

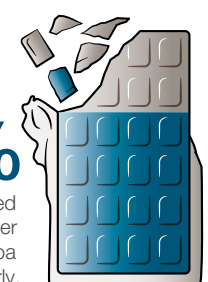


**7**

out of Europe's top 10 bakeries run on Bühler technology.

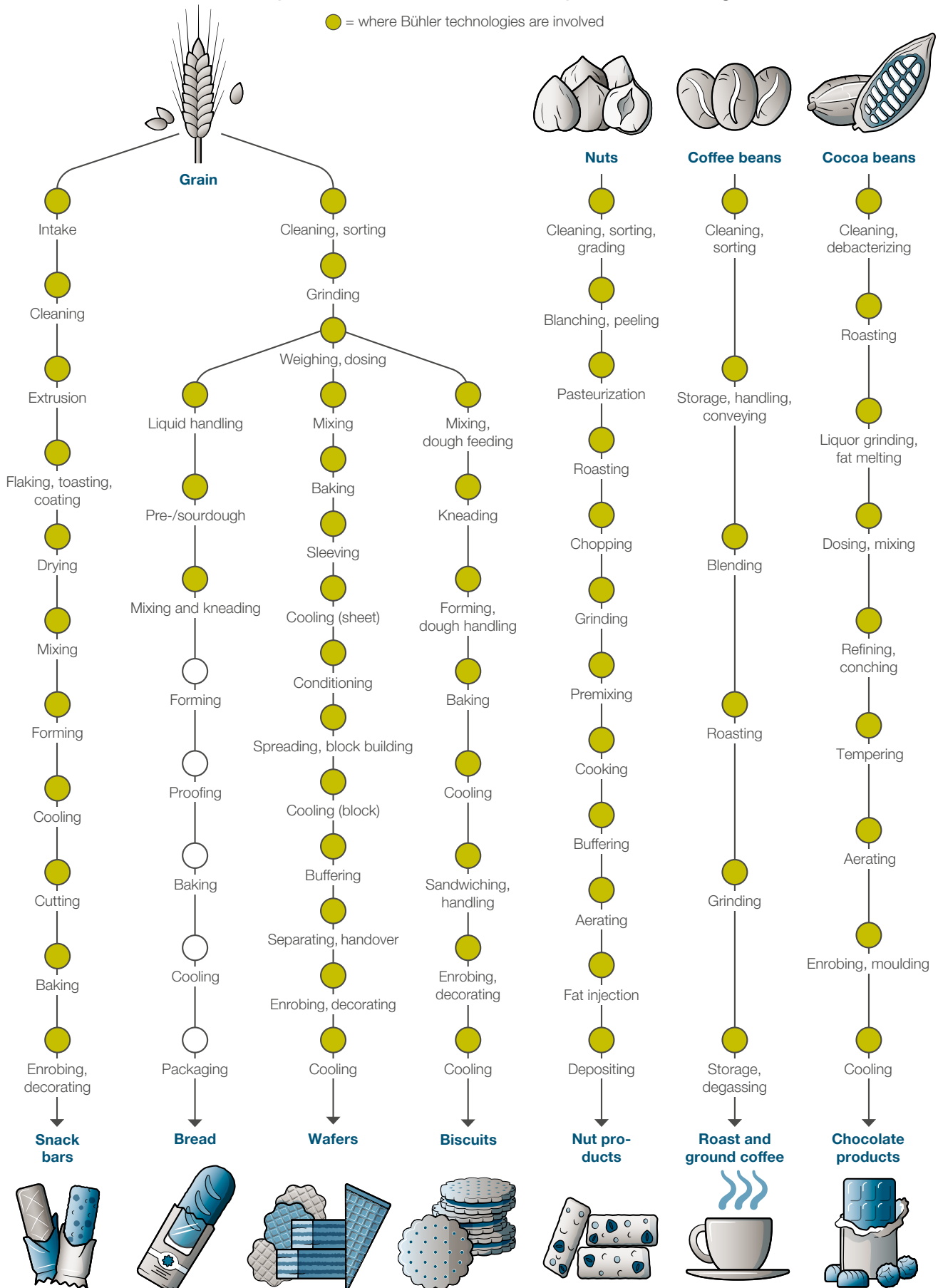
**70%**

of all chocolate is produced with Bühler solutions. Over 4.5 million tons of cocoa beans are harvested yearly.



**How various raw materials become high-quality food products:  
Seven examples of Bühler Consumer Foods process technologies**

● = where Bühler technologies are involved



# ADVANCED MATERIALS

## At a glance

We strive to ensure the efficient use of resources and to protect the environment. This is a common thread that runs through the technologies, process solutions, and applications of the Advanced Materials (AM) business. Lightweight components made of aluminum that reduce car fuel consumption are manufactured on production cells from our Die Casting business area; vacuum-coated architectural glass for building facades produced on systems from Leybold Optics make buildings more energy-efficient; and battery electrode slurry produced on Grinding & Dispersing equipment increases the range of electric vehicles.

The spectrum of applications covered by the three business areas is wide. It ranges from ultra-fine-grade pigments for analog and digital printing inks, to pastes for electronic components as well as components for cosmetics and agrochemicals, to electrode slurries for lithium-ion batteries. With our technologies, our customers produce coatings for sensors, lenses for eyeglasses and cameras alike, solutions for displays such as mobile phone screens, and applications in precision optics for lasers or LIDAR (light detection and ranging). And on the light-metal casting side, applications for engine blocks, oil pans, transmission housings, structural components, and typical e-mobility-related components such as battery or electronic controller housings. Varied as these markets may be, there is one driver they share: the demand for improved mobility. Approximately 60% of the AM business stems from the automotive industry, with electro mobility becoming an ever more important growth driver. The business areas not only supply the technologies and systems, but also process expertise, including a global network for testing, training, consultation, and a wide range of services.



**Die Casting**

Bühler Die Casting is the global technology partner for all high-pressure die-casting needs and supports its customers through all phases of their investment.



**Leybold Optics**

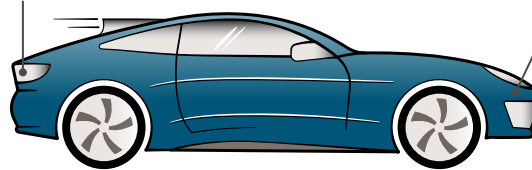
Bühler Leybold Optics is the specialist for the development and manufacturing of vacuum-coating by physical vapor deposition equipment.



**Grinding & Dispersing**

Bühler Grinding & Dispersing offers future-oriented wet mixing, grinding, and dispersing technology solutions for a variety of industries.

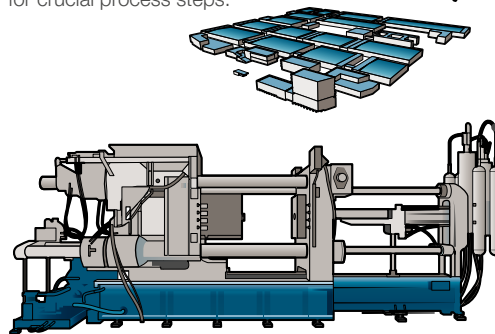
**35%** of the world's car taillights and headlamps are metallized on Bühler machines.



**50%**

of new cars worldwide have die-cast components produced with Bühler technology.

**60** gigafactories will be running worldwide by 2030. Bühler offers solutions for crucial process steps.



**Some 25%** of all die-cast components produced globally are made on Bühler systems.

**Nearly 1,000**

die-casting foundries rely on Bühler day in, day out.

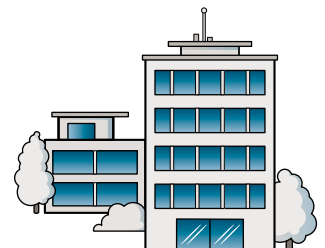
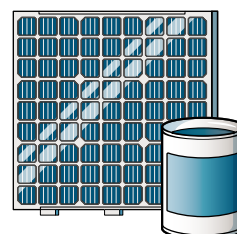


**Over 75%**

of all banknote printing inks are made with Bühler machines.

**75%**

of the silver paste used in solar panels is produced on Bühler equipment.



**50%**

cut in energy is achieved in buildings using architectural glass coated by Leybold Optics glass coaters.



**Aluminum to die-cast parts, pigments to cosmetics:**  
**Six examples of Bühler Advanced Materials process technologies**

● = where Bühler technologies are involved

