FACTS AND FIGURES 2018

Feeling
good
At Bühler, we feel good about what we do. We have a positive impact on the economies in which we operate and the people we employ. We are proud to play a decisive role in vital industries. From the foods you eat, to the cars you drive, to the technologies you use daily, Bühler is part of your life. We are working to create sustainable innovations for a better world so that our customers and consumers can feel as good as we do.
THE BÜHLER GROUP

Every day, billions of people come into contact with Bühler process technologies to cover their basic needs for food and mobility. We develop innovations for a better world with a focus on sustainability, health, safety, and energy efficiency.

GRAINS & FOOD

We significantly contribute to safely feeding the world as a front-runner in the global production and processing of wheat, corn, oats, rye, rice, pasta, cereal, and pulses. Our Grains & Food (GF) solutions and digital technologies help manufacturers make safe and healthy finished products for both human and animal nutrition. Learn more about where you will find our GF technologies on pages 14–15.

CONSUMER FOODS

We offer the full gamut of technologies and solutions to bring life’s little pleasures to people all over the world. From equipment to roast cocoa beans, machines to prepare dough, ovens for baking wafers, and enrobing machines for that final delicious chocolatey touch, Consumer Foods (CF) is the single source from raw material to tasty sweets and savory treats. Learn more about where you will find our CF technologies on pages 16–17.

ADVANCED MATERIALS

We provide solutions for die-casting, wet-grinding, and thin-film technologies for high-volume application areas, including the automotive industry, precision optics, ophthalmics, electronics, packaging, inks, and paints. Our Advanced Materials (AM) solutions and technologies help manufacturers produce higher-efficiency vehicles, make buildings more economical, advance telecommunications, and give better eyesight to wearers of prescription lenses. Learn more about where you will find our AM technologies on pages 18–19.
IMPROVED MARKET POSITION AND GROWTH

2018 is marked by the successful integration of Haas, an improved market position, and a high rate of innovation.

The 2018 business year was characterized by continued organic growth in all segments with a gain in market share. Based on the successful integration of the Austrian Haas Group, Bühler established a third business pillar: Consumer Foods, effective January 2019. With this strategic step, we improved our market position in this important growth market. Haas already contributed positively to Bühler’s performance in the first year. While maintaining a healthy financial position, our profitability margin stands slightly below last year’s level and does not fully reflect the earnings potential of the company.

The leading technology and market position of the Bühler businesses was further strengthened by ongoing, substantial investments and accelerated development with a focus on digital platforms and services. It is for this reason that we have made extensive strategic investments in recent years, for example, in the construction of our new CUBIC innovation campus and the application centers in Uzwil, Switzerland. We have also invested in our global production network, opening a battery application lab in Wuxi, China; moving our Die Casting revision business to a new location in Brescia, Italy; and modernizing our Uzwil site. Despite the somewhat gloomy economic conditions of 2018, we remain optimistic that we will continue on a sustainable course of economic growth.

All businesses showed organic growth

All Bühler businesses have shown a continuation of organic growth by increasing their order intake, the most important indicator for growth. With a growth rate of 3.2%, the order intake of Grains & Food (GF) again surpassed the CHF 2 billion threshold, reaching CHF 2.2 billion. The order intake of Advanced Materials (AM) increased by 7.3% to CHF 721 million.

Order intake (in billion CHF) +17%

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
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<tr>
<td>Value</td>
<td>2.58</td>
<td>2.47</td>
<td>2.54</td>
<td>2.80</td>
<td>3.29</td>
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Turnover (in billion CHF) +22%

<table>
<thead>
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<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<tr>
<td>Value</td>
<td>2.33</td>
<td>2.41</td>
<td>2.45</td>
<td>2.68</td>
<td>3.27</td>
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</table>

Equity ratio (in %) -2.3 pp

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
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<tbody>
<tr>
<td>Value</td>
<td>45.2</td>
<td>45.5</td>
<td>46.6</td>
<td>44.5</td>
<td>42.2</td>
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</tbody>
</table>

Net liquidity (in million CHF) +1%

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>464</td>
<td>392</td>
<td>462</td>
<td>443</td>
<td>448</td>
</tr>
</tbody>
</table>

*excluding corporate bond of CHF 420m
million, and Haas contributed CHF 382 million. Turnover grew even more strongly: GF by 9.2% to CHF 2.2 billion, AM by 5.6% to CHF 705 million, and Haas added CHF 373 million. As a result of the combined organic and acquired growth, we were able to raise order intake on the Group level by 17% to CHF 3.3 billion compared to the previous year. Turnover increased by 22% to CHF 3.3 billion, which resulted in an order backlog of CHF 1.92 billion (+5.9%).

All regions contributed to this positive performance, whereby turnover growth in Europe (+28%) and Asia (+40%) stand out. Europe accounts for 31% of the global turnover and Asia for 30%. This is all the more encouraging as it demonstrates that Bühler has the ability to harness the potential of developing markets as well as those that are more saturated. Our geographic range is broad and well-balanced: Europe 31%, Asia 30%, North America 14%, Middle East & Africa 14%, South America 6%, and South Asia 5%.

Structurally, our portfolio mix also achieved further gains. Services (+19.5%) and the single machine business (+5.7%) together account for turnover of CHF 971 million. The e-commerce platform, myBühler, is developing into an important service business. At the end of 2018, 4,000 Bühler customers were connected. Turnover also increased by 25.2% in projects and plants.

**Strong financial position remains**

EBIT increased in absolute terms by 13% to CHF 231 million, which represents an EBIT margin of 7.1% (previous year: 7.6%). Profitability was impacted by necessary adjustments at our Changzhou, China, site. After years of over-proportional growth in China, this move ensures its alignment with Bühler’s global standards and systems and sets the foundation for further expansion. Without this one-time effect, the EBIT margin would have been 8%.

With a slightly improved tax rate of 20.1% (previous year: 20.2%) and a financial result of CHF 4.6 million (previous year: CHF 13 million), net profit grew by 9% and reached CHF 188 million (previous year CHF 173 million). Starting from a healthy level, Bühler’s financial situation remained strong. The expenses for research and development (R&D) were further increased to CHF 145 million (4.4% of Group turnover) in line with our strategy to be an innovation leader in our industries.

The investments into the asset base were also expanded to CHF 118 million (+18%). Operating cash flow increased by 28% to CHF 202 million. Net liquidity remained high at CHF 448 million (+1.1%, excluding the corporate bond). The equity ratio dropped slightly to 42.2% (previous year: 44.5%) mainly due to effects from the Haas acquisition.
STRONG OPERATING BUSINESS

All Bühler segments contributed to its strong growth – with Advanced Materials once again posting record results and Haas already having made a positive impact on the Group result in the first year of its acquisition.

Order intake
CHF 2.2 billion +3.2%

Turnover
CHF 2.2 billion +9.2%

Grains & Food

Grains & Food, which returned to growth in 2017, was able to sustain its upward trend in 2018 and increased order intake by 3.2% to CHF 2.2 billion. Turnover grew 9.2% to CHF 2.2 billion. The growth was fueled by the growing demand in the consumer foods market. Bühler’s Consumer Foods business area achieved a growth rate of more than 20% due to extraordinarily large orders from Japan, Germany, and the US. Milling experienced moderate growth as a result of Southeast Asia and China increasing investment in food security. We also progressed with our single machine business, namely, with our optical sorters. In the high-end optical sorting market we have gained market share, strongly driven by new applications for fruits and vegetables.

With Mill E3, Milling Solutions introduced a completely new concept that revolutionizes industrial milling. With the integrated grinding system Arrius, preassembled and tested modules, and a power-bus bar system, Mill E3 reduces energy consumption by 10%, enables 30% faster installation, and a 30% reduction of investment into construction. We are reducing the height of the building by half, to three floors.

Grain Quality & Supply continued to be the clear market leader for the brewery market, winning major orders for malting. In 2018, we also saw improvements in the grain storage market, where we strengthened our market position.

In Digital Technologies we established our position as a leader for digitalization. We introduced more than 20 digital innovations, achieved sizable first turnover, and we entered into a partnership with Microsoft. Within this business area, our sorting business did especially well with the growth in new market segments such as fruits and vegetables, creating technologies for the grading of products, and for separating contaminants.

Following the successful integration of Haas in 2018, Bühler decided to strengthen its leading position in the consumer foods market with the creation of a new business pillar beginning 2019. The new Consumer Foods business includes the Bakery, Wafer, Biscuit, Chocolate & Coffee, and Confectionery business units.

With the Networking Days in Changzhou, China, which focused on animal nutrition, Bühler positioned itself as a leading solution provider in the global feed market. The three-day event at this new manufacturing and R&D center for the feed industry attracted over 1,000 guests from over 30 countries.
Haas

Already in the first year of being part of Bühler, Haas contributed strongly to the Group’s performance. Under the leadership of CEO Germar Wacker, Haas achieved CHF 382 million in order intake and CHF 373 million in turnover. It was the best result in the history of Haas and mainly driven by the wafer and biscuit businesses.

In wafers, in which Haas already has a strong position with almost 50% global market share, Asia and Europe showed the strongest demand. In Indonesia, our largest customer decided to further increase capacity and expand into other Asian regions, especially China.

Together, Haas and Bühler offer comprehensive and integrated solutions. This is best illustrated with a customer project that began in 2018 to develop a new snack that includes wafers, cream, nuts, and chocolate, and also enrobing. This customer is now able to develop this complex product and the respective production line with one technology and solution partner.

Haas also showed strong turnover growth in biscuits, and took the opportunity to consolidate this business after years of expansion and more than doubling its size. The biscuits portfolio was streamlined and processes were aligned to meet the demands of a larger organization. With this, the Haas biscuit business is prepared for the next growth step in this important market within the new Consumer Foods business. Its aim is to gain additional market share.

In 2018, Haas also presented a series of innovations underscoring its leading technology position – such as the new Eco Oven demonstrated at the iba trade show in Munich. The oven reduces energy consumption by around 30% as confirmed by first customer trials. Another leading-edge application is its smart glasses. Based on an augmented reality solution and device, smart glasses make a completely new way of servicing machines and equipment possible.

Order intake

<table>
<thead>
<tr>
<th>CHF</th>
<th>+4.0%*</th>
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<tbody>
<tr>
<td>382 million</td>
<td></td>
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</table>

Turnover

<table>
<thead>
<tr>
<th>CHF</th>
<th>+17.1%*</th>
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<tbody>
<tr>
<td>373 million</td>
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</table>

*Compared to previous year where Haas had not been part of Bühler.
Advanced Materials

Advanced Materials saw outstanding performance for the fifth year in succession and had another record year in 2018. It continued riding its wave of growth from 2017 to develop the business further, increasing order intake by 7.3% to CHF 721 million and turnover by 5.6% to CHF 705 million. The first Networking Days run by Advanced Materials in Suzhou, China, in April 2018 on the future of mobility highlighted the positioning and relevance of the business as a solution provider for the automotive industry and beyond.

After the successful market launch of a new process for manufacturing battery slurry, Grinding & Dispersing succeeded in tripling the business with corresponding orders for additional production lines. This battery slurry process has increased the electrical properties of batteries and is also more profitable. Grinding & Dispersing also grew in other areas – such as digital printing for personalized applications – driven by innovative products such as MacroMedia and MicroMedia in combination with integrated and modularized plant construction designs. This new technology and plant generation reduces use of raw materials by up to 10%, energy by up to 30%, and costs by up to 20%. The expertise in ink production also highlights the strong position in security inks. The ink in the new 200 Swiss franc note, for example, is processed on three-roll mills.

Success is further accelerating in Die Casting. This business area is experiencing a substantial increase in incoming orders and turnover. Growth has been driven by the Carat and Ecoline machine series. Thus far, over 500 systems of both product families have been installed at customer locations. Alongside previous technical solutions, three factors have been decisive here: First, the global positioning of Die Casting – Bühler is the only solution provider with the ability to locally produce die-casting machines in all three major hubs of the automotive industry. Second, this business area has in-depth knowledge of applications for aluminum structural components. Third, Die Casting is profiting from the rapid development of e-mobility, as it is increasingly common for parts of these vehicles to be made of light alloys. In Brescia, Die Casting moved into a new home with its revision business. This is now geared to double in volume, underlining the commitment to customer service.

Leybold Optics saw a massive increase in business with precision optics coating systems, including its Helios technology. The business area has successfully launched the new ion-beam sputtering solutions for high-end applications with the most challenging requirements. Furthermore, Leybold Optics has improved its strategic market position with the acquisition of Sputtering Components Inc., Owatonna, US. With this move, Leybold Optics acquired crucial products and technologies for large-area vacuum coating systems. Sputtering Components Inc. will continue to serve the global producers of coated glass and displays, integrating Leybold Optics’ expertise in optical measuring technology and process control.

### Order intake
<table>
<thead>
<tr>
<th>CHF</th>
<th>721 million</th>
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<tbody>
<tr>
<td>+7.3%</td>
<td></td>
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### Turnover
<table>
<thead>
<tr>
<th>CHF</th>
<th>705 million</th>
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<tbody>
<tr>
<td>+5.6%</td>
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</table>
STRATEGIC INVESTMENTS

In 2018, Bühler invested CHF 118 million into its asset base – in line with its Strategy 2020. In addition to the acquisition of the Austrian Haas Group and US-based Sputtering Components Inc., the funds were used primarily for the development of new digital technologies and process solutions, the modernization of our production and service network, as well as for strengthening our innovative capabilities. We have proactively utilized our capital, without overstretches our room to maneuver.

The added value of the union of Haas and Bühler was clearly apparent in the first year following the acquisition – the closing took place in January 2018. Haas is a highly respected manufacturer of systems for producing wafers, cookies, and biscuits and is the clear market leader. The machines and solutions from Haas and Bühler ideally complement one another. This fruitful fusion has unlocked a multitude of opportunities for both companies to jointly take a leading position in the consumer foods market.

From the time of the announcement, the liaison between Bühler and Haas met with approval. Customer responses were positive: “Haas and Bühler are a perfect match. The amalgamation opens the way for innovations.” And: “The fact that Haas is coming together with Bühler is very positive for us. It is easier to do business with one company than with two.” Another example: “Haas and Bühler support us as confectionery producers, and we support both companies, for example, in the development of new machines and applications.”

The merger has already resulted in many joint projects, and has created a great deal of value for our customers. As a result of this positive momentum, we decided to accelerate the seamless integration of Haas. For this reason, the technically related Bühler business units for chocolate, baked goods, and coffee have moved from the Grains & Food segment and fused with Haas to make a new, third Bühler business pillar – Consumer Foods. The new organization is led by the previous Haas CEO, Germar Wacker, who was also made a member of the Executive Board. Both moves came into effect on January 1, 2019. Bühler continued to invest strongly in innovation with expenses for research and development (R&D) of CHF 145 million (previous year: CHF 119), representing a ratio to turnover of 4.4%. The transformation to digitalization, initiated in 2016, moved forward at an impressive pace in the 2018 reporting year. About 20% of our innovation spending went into developing digital solutions.

Dynamic digital transformation

The e-commerce solution myBühler, which enables existing customers to request services and replacement parts on the portal, significantly contributed to our digital offering. About 4,000 Bühler customers were connected at the end of 2018.

Bühler and Microsoft committed to an alliance in April 2018 that will enhance food safety and traceability with the rollout of cloud-based solutions. The Bühler Insights digital platform is another milestone launched in September. It is our secure, high-performance, and reliable cloud platform for digital services. It sets new standards in security, traceability, transparency, and data availability across production value chains. Bühler developed the new platform in close partnership with Microsoft. The result is a single solution to run all of Bühler’s digital services.

Today, more than 85% of our solutions can be connected to it. It offers numerous interfaces with standard industry automation and control systems, thus enabling the connection of a wide range of technologies.

At the Microsoft Ignite trade show held in September 2018 in Orlando, Florida, Bühler presented a selection of its digital services. This included MoisturePro, a cloud-based digital service that greatly reduces the energy costs of thermal processing for the food and feed industries. MoisturePro is just one of a range of services that are connected with Bühler Insights. Another is LumoVision, an optical sorting
solution that makes it possible to identify and sort corn contaminated with aflatoxin, a carcinogen produced by mold. LumoVision uses ultraviolet cameras and sensors to cut rates of contamination in corn by as much as 90% – as well as maximize productivity.

Two image-processing solutions are also connected to Bühler Insights: GrainiGo for corn and TotalSense for rice. These enable customers to analyze and document the quality of these raw materials using the portable units, their smartphones, an app, and sample trays where quality parameters have been set. A photo is made via smartphone and sent to the secure Bühler Insights platform for analysis. It produces a report that dates and locates the sample for quality traceability and as proof of quality compliance. A short time later, the reports are already available. Saving time is critical when adjusting machinery on a production line to maximize output and profitability.

PastaSense, also launched in 2018, uses sensor technology to allow producers to monitor their entire process from raw materials to the end product, completely eliminating the need for manual checks.

Other new digital solutions from Bühler include safefood.ai, which has the potential to revolutionize food safety management by scanning thousands of web pages, databases, news, and social media channels for relevant information. It identifies the products affected and provides customized early warnings to companies so that they can quickly respond. PreMa, meanwhile, facilitates safe grain storage by measuring and tracking the key functions of silo plant equipment, including cleaning machines, filters, elevators, chain conveyors, and silo bins.

Currently, customers can choose from a digital portfolio of over 30 digital services. A further 30 will be launched during 2019. This is just the beginning. Bühler, in partnership with Microsoft, is also actively exploring the potential of blockchain technology to achieve full traceability in the food chain and significantly increase safety and transparency. Blockchain will enable companies to trace the source of any contamination...
in no time, averting potential problems of illness, production losses, and reputational damage.

Global innovation and production network

For investments in Bühler’s global production network, three projects stand out: the opening of a new battery application lab in Wuxi, China, the move of Bühler’s Die Casting revision business to a new site in Brescia, Italy, and the modernization and expansion of the Uzwil, Switzerland site.

In view of the rising demand for lithium-ion battery production, Bühler opened a 400-square-meter application lab in Wuxi to support customers with concept trials, formulation, and process optimization. China is witnessing a high demand for electrode slurry plant projects, thanks to ambitious government plans to electrify the automotive sector. In China, 40% of all cars sold should be partially or fully electrified by 2030. Another field of application is the intermediate storage of solar or wind energy. As a consequence, substantial market growth rates are forecast for lithium-ion batteries. This new application center sets a new standard for innovation within the Bühler Group. In Brescia, Die Casting moved into a new home with its revision business, which is now geared to double in volume, underlining the commitment to customer service.

The work to modernize its Swiss location is running according to plan. The goal of the five-year project is to develop Uzwil into one of the world’s leading production sites using Industry 4.0 technologies. This should maintain the competitiveness of the Swiss location for the longterm. The first phase – to refurbish production and logistics for mass-produced parts – is completed. The construction and refurbishment of innovation labs and application centers is ongoing as part of the CUBIC innovation campus project.

The CUBIC is nearing completion. In early 2019, Bühler employees began moving in, and the official opening of the fully operational innovation campus is set for spring. The CUBIC connects to the application centers where customers can conduct tests with Bühler technologies and experts. The considerable investment of about CHF 50 million over a period of three years is a sign of the company’s dedication to innovation, technology, and Switzerland as a location. The campus will create new opportunities for cooperation both internally and with external partners. We want to sustainably increase the innovative strength and market leadership position of Bühler for the longterm, and work together with partners from industry, science, NGOs, and start-ups to develop innovations for a better world.

With positive energy into the future

We continue to view the future with optimism. We are aware of the accelerated changes of the digital age and are keeping an eye on the uncertainties in current world events, including geopolitics, currencies, interest rates, and opposing trends in free trade. Meanwhile, new business opportunities are emerging, such as in the developing countries of Africa or China’s new Silk Road initiative. We are convinced that the opportunities for Bühler are greater than the risks.

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We are well placed to achieve the leading position in the consumer foods market with our new business pillar, and we have fully embraced the new and exciting opportunities offered by digitalization. We are investing considerable resources in developing and harnessing these opportunities. And in the spirit of our partnership-based innovation philosophy, we will continue to work with our customers and to expand our innovation network to make our physical world better with digital means. We will host a broadly scoped Networking Days event in Uzwil in August 2019, which for the first time will cover all Bühler business units.

Under the Networking Days 2019 slogan “Creating Tomorrow Together,” we will continue to work together with our customers, partners from industry and science, as well as academia and start-ups to explore new, sustainable solutions for food production and mobility. We want to leave our children and following generations with a planet that, at the very least, offers them the same life and development opportunities it offers us. It is our responsibility today to ensure a sustainable tomorrow.

Bühler anticipates its growth course will continue with further improved profitability in the 2019 business year.
IN THE REGION, FOR THE REGION

Bühler is a global player with manufacturing sites, service stations, sales offices, R&D facilities, and application and training centers across 140 countries. It has further strengthened its regional presence for its customers with the acquisition of Haas.

**North America**

- Sales offices: 9
- Service stations: 7
- Manufacturing sites: 3
- Application centers: 6

**Highlights**

North America achieved fantastic growth in coffee and nuts and also in Die Casting. Bühler Raleigh began with the modernization of its facilities. The integration of Bühler’s Leybold Optics business was another substantial step taken in 2018. A new Food Application Center for specialty milling and novel food applications is under construction in Minneapolis. It will open in the first half of 2019.

**South America**

- Sales offices: 6
- Service stations: 13
- Manufacturing sites: 3
- Application centers: 2

**Highlights**

South America increased its orders within a difficult market environment and achieved a breakthrough in the feed market as well as substantial business growth in Chile and Peru. The strong local service setup was rewarded with record orders for Customer Service and single machines.

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= 2018 turnover share by region

= Total 13,165 employees (incl. Haas) in 2018 compared to 10,972 in 2017
Europe

- Sales offices: 26
- Service stations: 26
- Manufacturing sites: 17
- Application centers: 8

Highlights
Europe achieved a record year with orders of more than CHF 1 billion. This growth was primarily driven by the businesses of Consumer Foods and Die Casting. Our Customer Service solutions enjoyed a growing attractiveness and grew in double digits.

Asia

- Sales offices: 23
- Service stations: 25
- Manufacturing sites: 8
- Application centers: 7

Highlights
Asia celebrated the grand opening of a new manufacturing and R&D site in Changzhou in April. In the same month, the AM Networking Days 2018 held in China attracted 200 customers, experts, and influencers who discussed future trends in their industries. A new service station and application center was opened in Myanmar. Overall, Asia achieved a record year in turnover with growth of more than 40%.

Middle East & Africa

- Sales offices: 14
- Service stations: 15
- Manufacturing sites: 1
- Application centers: 1

Highlights
Middle East and Africa developed positively despite a very difficult market environment. Bühler strengthened its organizational setup in Nigeria and Ivory Coast, where training and service facilities were built.

South Asia

- Sales offices: 7
- Service stations: 14
- Manufacturing sites: 1
- Application centers: 1

Highlights
South Asia implemented a zone structure across the whole subcontinent to be much closer to customers. This structure supported our growth strategy, and India recorded a record year of new orders driven by Milling and Die Casting.
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.
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**GRAINS & FOOD**

**At a glance**

- 75% of global malt processing is covered by Bühler solutions.
- 65% of the world’s grain is processed on Bühler machinery.
- 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.
- 40% of industrially made pasta is produced using Bühler technology.

**How various raw materials become high-quality food products:**

Seven examples of Bühler Grains & Food process technologies

- **Pulses**
  - Pre-cleaning and storage
  - Cleaning
  - Drying
  - Hulling
  - Grading
  - Splitting
  - Optical sorting
  - Grinding
  - Sitting
  - Pulse flour

- **Grain**
  - Storage
  - Cleaning
  - Material handling
  - Weighing
  - Mixing
  - Extruision
  - Cooking
  - Shaping
  - Pre-drying
  - Flaking
  - Toasting
  - Cutting and forming
  - Frying or drying
  - Grinding
  - Dosing
  - Sheetng
  - Steaming
  - Dough preparation
  - Drying
  - Hygienizing
  - Mixing
  - Bagging and load out
  - Pulse flour

- **Paddy rice**
  - Intake, pre-cleaning, and storage
  - Cleaning
  - Rice cleaning
  - Storage and drying
  - Rice milling
  - Rice milling
  - Steeping
  - Rice milling
  - Hygienizing
  - Grading
  - Germination
  - Klinning
  - Bagging and load out
  - Supporting element
  - Degerming
  - Malt
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 chocolates, 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.

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.

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.

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.

Chocolate & Coffee provides complete solutions for processing cocoa beans to high-quality chocolate masses and develops coffee and nuts into tasty end products.

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.

70% of all chocolate is produced with Bühler solutions. Over 4.5 million tons of cocoa beans are harvested yearly.

7 out of Europe’s top 10 bakeries run on Bühler technology.
How various raw materials become high-quality food products:
Seven examples of Bühler Consumer Foods process technologies

- Grain
  - Intake
  - Cleaning
  - Extrusion
  - Flaking, toasting, coating
  - Drying
  - Mixing
  - Forming
  - Cooling
  - Cutting
  - Baking
  - Enrobing, decorating

- Nuts
  - Cleaning, sorting, grading
  - Blanching, peeling
  - Pasteurization
  - Roasting
  - Chopping
  - Blending
  - Dosing, mixing
  - Refining, conching
  - Tempering
  - Aerating
  - Enrobing, moulding
  - Cooling

- Coffee beans
  - Cleaning, sorting
  - Cleaning, debacterizing
  - Roasting
  - Storage, handling, conveying
  - Liquor grinding, fat melting
  - Dosing, mixing
  - Refining, conching
  - Tempering
  - Aerating
  - Enrobing, moulding
  - Cooling

- Cocoa beans
  - Cleaning, sorting
  - Cleaning, debacterizing
  - Roasting
  - Storage, handling, conveying
  - Liquor grinding, fat melting
  - Dosing, mixing
  - Refining, conching
  - Tempering
  - Aerating
  - Enrobing, moulding
  - Cooling
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 electromobility 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.

ADVANCED MATERIALS
At a glance

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.

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

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

50% of the world’s car taillights and headlamps are metallized on Bühler machines.

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.

30 gigafactories will be running worldwide by 2030. Bühler technology has gained market share in the battery segment beyond first-reference installations.

Nearly 1,000 die-casting foundries rely on Bühler day in, day out.

50% of new cars worldwide have die-cast components produced with Bühler technology.

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

A 50% cut in energy is achieved in buildings using architectural glass coated by Leybold Optics glass coaters.
At a glance:

- ADVANCED MATERIALS

Our customers produce coatings for displays, and typical e-mobility-applications in precision optics for eye-glasses and lenses for eyeglasses and cameras alike, solutions for displays, electric vehicles.

- Energy-efficient; and battery electrode slurries for electrode slurries for lithium-ion batteries.

Leybold Optics make buildings more energy-efficient; and battery electrode slurries for lithium-ion batteries.

Some facts and figures:

- 60% of the AM business stems from the automotive industry, with e-mobility becoming an ever more important growth driver. The business areas ranging from ultra-fine-grade pigments to conductive additives, binder, and solvent, as well as components for cosmetics and chemical packaging.

- Nearly 75% of all banknote printing is metallized of the silver paste used in solar panels is produced on Bühler equipment.

Aluminum to die-cast parts, pigments to cosmetics:

Six examples of Bühler Advanced Materials process technologies

- Pigments and chemical materials
- Resin
- Film
- Acrylic acid
- Active material, conductive additives, binder, and solvent
- Aluminum, magnesium

- Storage and conveying
- Weighing and dosing
- Mixing and pre-grinding
- Wet grinding
- Conditioning and let-down
- Potting, packaging

- Lens design
- Surfacing
- Polishing
- Cleaning
- Hard coating
- Antireflective coating
- Edging
- Framing

- Film manufacturing and primary slitting
- Film metaling
- Polishing
- Cleaning
- Top coating
- Antireflective coating
- Edging

- Purifying
- Polymerization
- Drying
- Binder dissolving
- Grinding
- Continuous mixing and dispersing

- Melting
- Dosing
- Casting
- Trimming
- Marking

- Film metallizing
- Film metaling
- Polishing
- Cleaning
- Top coating
- Antireflective coating
- Edging

- Liquid and powder dosing
- Binder dissolving
- Grinding
- Continuous mixing and dispersing

- Melting
- Dosing
- Casting
- Trimming
- Marking

- Aluminum to die-cast parts, pigments to cosmetics:
- Six examples of Bühler Advanced Materials process technologies
  = where Bühler technologies are involved