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Dear Readers

Bühler is widely known for its capabilities in the development and manufacture of processes and production plants for the food industry. But Bühler also possesses expert knowledge when it comes to processing and transforming aluminum, pigments, or PET pellets into higher-grade products. Our nonfood activities are grouped in the Advanced Materials division. “Advanced” refers to the goals of the three business units Die Casting, Grinding & Dispersion/Nanotechnology, and Thermal Processes to offer their customers production systems and processes supporting them in their efforts to generate added value and gain a competitive edge. Even if the Advanced Materials division’s sales are somewhat lower than the revenue generated by the two food divisions, it time and again attracts the specialist community’s attention with new developments of processes and production plants. In this issue of Diagram, you will find a portrait of the Advanced Materials division as well as a number of examples of its successes.

We wish you much pleasure reading it!

Calvin Grieder, CEO
The nonfood activities of Bühler Group are merged in the Advanced Materials division. They offer solutions and systems for transforming different engineering materials into high-grade intermediates. The division is headed by Achim Klotz.

Bühler stands not only for processes, production plants and equipment for processing basic foods. Since its founding 151 years ago, Bühler has also been synonymous with numerous solutions and systems for processing and upgrading advanced nonfood materials – ranging from aluminum and pigments to PET and nanoparticles.

New division
The business units dealing with nonfood materials used to be autonomous entities. When Bühler Group was reorganized in 2009, they were merged in the Advanced Materials division. Achim Klotz was entrusted with establishing and heading the division. Up to then, he had headed the Die Casting business unit and as a member of Group Management was the ideal person for assuming this task. “For me, this was at once a great challenge and a sensational opportunity to enter new demanding markets,” says Klotz in retrospect.

“We transform and upgrade”

Achim Klotz (second from right) with his business unit managers Bernhard Fritsche (second from left, Die Casting), Samuel Schär (right, Grinding & Dispersing/Nanotechnology), and Martin Müller (left, Thermal Processes).
Many common characteristics
Together with the heads of the nonfood business units, Klotz took stock of the existing activities and markets. “It was not long before we saw that the business units have many common characteristics,” says Klotz, summarizing the outcome of this brainstorming.
– They are all involved in the transformation of nonfood materials.
– They all have a strong market position.
– They all upgrade the original materials that they process to a higher quality level, which means that we are upgraders that generate added value!

We transform the original materials, additionally giving them new functions and new qualities. We transform
– aluminum into structural car components,
– pigments into value-adding materials for use in LCD display screens,
– contaminated post-consumer PET pellets into the raw material used for making new PET bottles,
– raw material into nanoparticles with numerous amazing properties by grinding and chemical reaction.”

Common characteristics were also found to exist in the units’ markets and customers. Achim Klotz: “The customers of our four business units are almost all international corporations that operate in the Automotive, Chemical Engineering & Plastics, and Electronics markets. They all have a similar business understanding. And they all move in dynamic and volatile markets.”

Energy and personal mobility
The management team headed by Achim Klotz boiled down the results of this stock-taking to two core insights that would benefit customers: “Energy efficiency and personal mobility. We therefore defined Energy and Mobility as the common drivers of our activities.”

Die Casting: The fast lane to higher efficiency
Environmentally friendly cars are the future: Fuel prices and consumers who are sensitized to the need for environmental protection are powering demand, and legislators are continuously defining more stringent regulations. A lower car weight allows both fuel consumption and carbon emissions to be reduced. Carmakers are therefore using aluminum, since structural automotive components made from this metal – for example gearboxes, engine blocks, suspension strut supports, and structural body elements – allow the weight of cars to be slashed.

Aluminum processing is a core competence of the Die Casting business unit. Another specialty is magnesium – which is again one third lighter than aluminum.

Bühler Die Casting masters all the aspects of aluminum processing – from preparation to processing. The large carmakers trust its capabilities. With a market share of about 30%, Bühler is the world’s market leader in the fields of cold-chamber aluminum and magnesium die casting systems. Bühler supports its customers in further refining their processes in order to reduce weight. Aluminum and magnesium are important elements in this effort. But this does not prevent the development engineers at Bühler from testing alternative materials for their suitability... (bos)
Achim Klotz
A steep career from die-maker to head of the Bühler Advanced Materials division: A German citizen born in Heidelberg in 1960, Achim Klotz learned the vocation of die-maker. He then graduated in mechanical engineering from the Technical University of Darmstadt. In order to enhance his business administration knowledge, he additionally obtained a degree in marketing and business administration from the European Business School in Wiesbaden. Then he joined Carl Schenk AG in Darmstadt, switching in 1989 to Balzers AG, where he was first in charge of sales and later on became member of corporate management. Achim Klotz joined the Bühler Technology Group in 1998 as head of Die Casting. As the most senior member of Group Management, he took charge of the newly formed Advanced Materials division in March 2009. (bos)

On this basis, Klotz established the structures of the young Bühler Advanced Materials division with its four business units: Die Casting, Grinding & Dispersion, Nanotechnology, and Thermal Processes. Achim Klotz: “The units operate independently. What they do together is to work on future solutions in the core areas.” The sales organization of the four business units is based on the Bühler platform that is in place around the world.

Energy efficiency
The “Energy” issue forms a powerful bond between the four business units. “This involves a two-pronged approach,” explains Klotz. “By improving the energy efficiency of the production plants and processes we supply, we enable our customers to optimize their energy costs. And we seek applications for our production systems and processes that will improve the energy balance of our customers’ end products. By reducing the weight of a standard-size car by 100 kilograms, we can cut carbon emis-

Energy savings achieved by recycling (in kWh/kg)

PET 0.4 2 1
Glass Aluminum Paper

PET recycling in Europe (in 1000 metric tons)

Grinding & Dispersion / Nanotechnology: Small and smaller

More than 50% of all electronic devices incorporate Bühler Grinding & Dispersion technology. In the color filters of LCD flat-panel displays, they ensure high brilliance and crisp contrast. Or capacitors on printed circuit boards store energy and smoothen the voltage. Cell (mobile) phones or computers contain an average of 200 to 1000 such components.

Over 50% of all silicon solar cells have metal contacts – manufactured on the basis of Bühler technology. The performance of the next-generation lithium-ion batteries will be yet further enhanced by Grinding & Dispersion technologies. Bühler has succeeded in building a second business pillar in the high-tech segment in addition to the powerful traditional field of printing inks.

In the production of these materials, the base material and the raw materials must be very finely ground and at the same time be dispersed. This is essential for making them suitable for use in high-quality end products. This is a technology that Grinding & Dispersion masters especially well also when high-viscosity materials are involved. With a market share of 25%, Bühler is the global leader in these technologies, with market share even exceeding 50% for the applications mentioned.

Nanoparticles are the basis on which the business unit manufactures additives with its special process and chemical engineering expertise. These additives can be thought of as being “spices” that are added to a product in small quantities in order to improve its properties. Thus, for instance, the additive Oxylink™ enables solvent-containing paints to be replaced by water-based products – a positive contribution to reducing climate warming. With sales of a little over one million Swiss francs, the Nanotechnology business unit is still a small start-up, but one with a great future. (bos)
Focus on Asia

The market focus of the four business units is on Asia. “Many of our international customers are based in Asia,” says Klotz. “For example, Grinding & Dispersion generates about 60% of its total sales in Asia, and so does Thermal Processes. In addition, the automobile market is experiencing rapid growth in China. This is generating very brisk demand for our aluminum die casting systems.” It does not come as a surprise that Advanced Materials currently has the highest order intake in Asia of all the Bühler divisions.”

Bühler has already responded to this development in Asia. Achim Klotz: “At the headquarters of Bühler China in Wuxi, we are building a new factory for manufacturing die casting systems of type Ecoline™. In 2013, 200 systems are to be produced for the Asian market.” Grinding & Dispersion also has news for the Asian marketplace. Klotz: “We have developed the Trinomic™ and Cenomic™ product lines for the up-and-coming markets in China, Southeast Asia, and India. We will start with a three-roll mill and a bead mill tailored to the needs of emerging markets. But that is only the beginning! We have also improved our range of services: a more powerful sales organization, a special-purpose laboratory for applications in China, a training center in India,...”

More than 50% of all silicon solar cells are provided with metal contacts – made on the basis of Bühler technology.
Heading for the future

The four business units of the Bühler Advanced Materials division are global leaders in their respective markets. But Achim Klotz does not intend to rest on these laurels: “Standing still means going backwards. We are forging ahead with developing new processes and systems in all the units. In Automotive, the aluminum age has started. We are seeking ways and means to make structural components lighter than ever before. A continuous stream of new legislation regulating fuel consumption and carbon emissions is showing us the direction.”

Achim Klotz also identifies bright opportunities in the Grinding & Dispersion business unit. “We can only achieve marginal further improvements as far as fineness and dispersion degrees are concerned. On the other hand, we can enter new markets such as lithium-ion battery technology or photovoltaics. More than 50% of all visible solar cells are provided with printed front-end contacts using metal pastes that are made on Bühler roller mills. Moreover, we are developing new processes for producing functional layers which unlock new possibilities for the producers of electronic devices – the market stands to experience some thrilling moments!”

Thermal Processes: Upgrading PET

There is hardly a more energy-efficient way of transporting beverages than in bottles made of polycondensate polymers (PET). According to a U.S. study, the energy balance of PET bottles is one third better than that of bottles made of glass. Thermal Processes upgrades polymers – as a virgin material or as recycled post-consumer PET. It offers processes and production plants allowing PET to be heated, cooled, crystallized, and dried. This gives it the right structure to be fit for making new PET bottles or for manufacturing high-performance fibers. These systems are also applied for producing specialty polymers such as PA, PC, POM, SAP, and biopolymers. Bühler also supplies plants for recycling post-consumer PET into materials for direct contact with foods. All of these systems are capable of processing flakes or pellets of different sizes.

The success of this business unit in the PET market confirms its competencies. More than two thirds of all PET producers partner with Bühler when it comes to choosing their thermal treatment systems. And Bühler is now transferring its PET know-how to another, ecologically promising polycondensate. Polylactic acid (PLA) is a biodegradable polyester made of fermented raw material.
A family-owned business invests in the future

Since being set up, Vitaflora Flour Mill has relied on Bühler as its technology partner. With the start-up of its new 240 t/24 h flour mill, Vitaflora now boasts another modern and efficient grain milling facility.

“My wish is that the Vitaflora Flour Mill will still be successfully operating in the marketplace as an independent family-owned business in the year 2050,” says Tibor Varga, replying to the question as to what medium-term goals he has set for his company. “After the war, all family-run business disappeared in Slovakia. It was not easy to establish one after the fall of the Iron Curtain. But when I look at the European flour milling industry today, what strikes me is the large number of successful family-owned companies with a long tradition. My efforts are aimed at ensuring that Vitaflora will remain an independent family business.”

State-of-the-art process technology

As a former vegetable wholesaler who entered the flour milling business as a newcomer, Tibor Varga has not only studied the history of the European grain milling business, but also its formula for success. “Only those mills have successfully held their own in the marketplace that continu-

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“Our partnership with Bühler proved its worth also in the construction of our fourth mill.”

Levente Varga (right), commercial director, and head mill
Zsolt Varga.
ously invested in the latest process technology available,” concludes Tibor Varga from his observations. He himself has stuck to this formula since constructing his first flour mill in 1994. In 2003, he built a second flour mill (180 t / 24 h) and in 2007 a third (240 t / 24 h). In 2010, he had a fourth such facility built to increase production capacities (240 t / 24 h). Concurrently with its construction, the A mill was converted into a rye mill and completely updated. Today, the Vitaflora Flour Mill boasts a total capacity of 730 t / 24 h on its premises in Kolarovo in the southwestern part of Slovakia and is thus the national market leader. All four mills are controlled and monitored from a centralized location.

High demands
For building the new mill, Tibor Varga relied on Bühler. “Bühler is the sole supplier that can reliably satisfy our high demands. In addition to the undisputed quality of its plant and equipment, its continuous innovative developments, and its dependability, our main reason for choosing Bühler as a technology partner was also because we are sure that Bühler will be around also in 50 years’ time. In planning, we take a long-term view, and we therefore also expect to rely on our partners far into the future. When you take a long-term view, price will not be your top criterion when making capital investments. We will continue to rely on the technological leadership of Bühler.”
Tibor Varga underscores the correctness of his decision to opt for Bühler by telling a short story: “When we built our first mill 17 years ago, two companies were neck to neck for a long time. Their plants were of comparable quality. At that time, we finally chose Bühler. And this decision turned out to be the right one, for Bühler has made huge technological strides since then.”

State-of-the-art mill
The latest of Vitaflora Flour Mill’s total of four facilities went into service in the course of 2010. By building the new flour mill, Vitaflora’s aim was to adjust its capacities to meet the rise in demand and customers’ needs for “tailor-made” specialty flour blends. The new mill was designed and constructed according to the standards of Bühler’s “New Art of Milling” concept.
Vitaflora Flour Mill

Tibor Varga became an independent businessman as a vegetable wholesaler a short time after the fall of the Iron Curtain. In 1990 he set up the family-run Vitaflora company in Kolarovo, where the borders of Slovakia, Austria, and Hungary meet, which focused on the fruit and vegetable trade. In 1994, Tibor Varga built his first flour mill. Over the years, three others were added. Today, Vitaflora has a total milling capacity of 730 t/24 h. The company’s raw material bins can hold 115,000 metric tons of grain. Vitaflora employs about 70 people in its large-scale mill in Kolarovo. Every year, it processes 170,000 tons of soft wheat and rye into a wide variety of flours, flour blends, and milling byproducts. Its customers are retailers, bakers, and bread factories. Since Slovakia joined the EU, Vitaflora has boosted its share of exports. Today, some 45% of all the flours it produces are exported to its neighboring countries the Czech Republic, Austria, and Poland, as well as Italy and Germany. Vitaflora is ISO-certified (9001:2008 and 22000:2005) and operates on the basis of international standards (International Food Standard IFS, Tesco Food Manufacturing Standard TFMS). Day-to-day business is in the hands of the second generation. Levente Varga is the son of the company founder and commercial director. Zsolt Varga is Levente’s cousin and in his capacity as head miller in charge of production. Both are graduates of the Swiss Milling School in St. Gallen.

With 14 Antares four-roller mills, two Sirius sifters, five Polaris purifiers, and an optical sorter of type Sortex Z+, the most advanced Bühler equipment is in service in the plant. In addition, the new state-of-the-art facility operated by Vitaflora is equipped with two blending and mixing lines – one continuous, the other based on batch operation. In order to also satisfy the most stringent sanitations standards, all the pneumatic conveying lines and chain conveyors are made of stainless steel.

For meeting special customer requirements, the new Vitaflora mill is provided with a line which uses the Bühler-developed attrition grinding process in a globally unique way. It allows the production of specialty flours that enable bakers to further enhance the quality of the loaves they make.

Controlled and monitored by WinCos

As part of the new construction of the fourth Vitaflora mill, the entire milling complex was integrated in a single network and automated. Thus, today all four mills are controlled and monitored from a centralized location using the WinCos automation system – from grain reception and storage to cleaning, grinding, customized blending, and loadout. Beside the com-
plete retraceability of all the production processes, Vitaflora's WinCos control system also has other noteworthy features. For example, the "Intelligent Route Navigation" function supports users in selecting the right wheat storage bin on the basis of quality parameters such as the protein and moisture content of the grain.

Ultimately, also Vitaflora’s customers benefit directly from WinCos. They can load their tankers with flour from the finished-product bins even outside regular office hours, without compromising data security and product safety. The truck driver simply enters his registration license on the terminal and can then automatically retrieve the preordered, specified flour delivery in the required quantity.

**Bakers' reactions**

Tibor Varga is highly satisfied with “his” new flour mill. “Following start-up and fine-tuning of the processes, we are now producing top-quality flour. What could be more gratifying for a flour miller than to see satisfied bakers enter his office with fresh loaves to proudly show what delicious bread they can make using the new flours.”

Levente Varga describes his personal satisfaction in somewhat more matter-of-fact words than his father does: “The new mill has enabled us to boost our sales by about 70% with the same number of employees. We can now offer our customers an even higher flour quality than before in terms of homogeneity and hygiene, as well as more accurate flour blends.” Levente Varga’s satisfaction applies to the entire mill. “With our various integrally controlled and monitored production lines, we are extremely flexible in our production processes. Moreover, we can make many different products of consistently high quality at high capacities.”
Bühler is a leading manufacturer of innovative solutions in the field of dispersion and wet grinding technology. One of the reasons for this position beside its engineering capabilities is also the range of services that customers around the world can benefit from. In the Centers of Competence (CoC) and the Regional Application, Development and Education Centers (RADEC), Bühler offers extensive services designed to enhance the quality and efficiency of production processes and thus to increase the competitiveness of customers.

Interview with Norbert Kern, Head of Process Engineering at Bühler AG, on the significance of the in-house Test Center for the Grinding & Dispersion business unit.

Norbert Kern, where are the Centers of Competence (CoC) and the Regional Application, Development and Education Centers (RADEC) located?

At our headquarters in Uzwil, we have the CoC HV (high viscosity materials) and the complete mixing and predispersion portfolio. At our German site in Viernheim, we have the CoC LV (low viscosity materials). RADECs are located in Mawah, USA; in Wuxi, China; and in Yokohama, Japan. In Japan, Europe, and the United States, many new products are developed – and these sites are therefore equipped with the required installations. The RADEC in China is additionally provided with a Cenomic™ 3 production bead mill. This machine is predominantly used for running commercial-scale tests.

Do any differences exist in this respect between Europe, the United States, and Asia?

At present, some regional differences still exist as far as customer requirements are concerned. But they are decreasing due to globalization. Especially China, Southeast Asia, and India are very important production sites. As a logical consequence, these regions focus on conducting commercial-scale tests. In the United States and in Europe, some of the tests are performed for developing new applications, and others for increasing existing production capacities. On the other hand, the focus in Japan is on process developments for making new materials and creating new applications. Thanks to our locally available competencies, we are close to customers and can respond quickly to their needs. Moreover, we understand our local partners’ requirements. Another important point is understanding regional mentalities. Customers always have a Bühler employee from the specific region as a contact.

Can you illustrate the benefits of Service Centers that are close to customers by giving us a concrete example?

Various display technologies use conductor pastes which have relatively low sintering temperatures. These pastes place high demands on the raw materials and their processing. Because of their scarcity and cost, only
very small quantities can be used for testing. At the same time, volatile solvents are frequently used which make shipping by air difficult. The possibility of conducting tests in the vicinity helps customers in a number of ways. They have permanent control over the product, and they can take part in the tests on site.

**What areas is research currently focusing on?**
The CoC HV is developing new processes for making metal pastes. Especially in the field of photovoltaics, an increasing need exists for maximum reproducibility as well as for data logging in order to ensure retraceability and to allow automation. And the electronics industry is increasingly requiring more gentle processes for dispersing the particles in a liquid phase. The crucial point here is to ensure that the primary particles are not overtaxed. In response to this need, the RADEC in Japan and the CoC in Viernheim are testing new geometries for achieving pure dispersion.

**What are the emerging market trends?**
At the moment, a lot is going on in the energy sector. For example, new applications are being developed for transforming and storing energy. Therefore, very demanding intermediate products are being used. They must often be dispersed in a liquid phase to allow them to be applied to different substrates. Bühler can cater to this need by offering outstanding equipment solutions and will meet the requirements by operating its own test sites provided with the appropriate capabilities.

Interview: Silvia Wipfl
Jardin Co. Ltd. is a leading coffee manufacturer in South Korea. As an innovative company, Jardin is receptive to the most advanced technological innovations. Its new, complete coffee processing line supplied by Bühler has a capacity of 800 kg/h and, among other equipments, comprises a TMR-125 roaster equipped with a cutting-edge profile roasting control system.

Jardin Co. Ltd. has been leaving its imprint on the highly developed and rapidly changing coffee market of South Korea since its foundation in 1984. The company operates factories in Seoul and Chungnam and produces all types of innovative coffee products – from roast and ground coffee to instant coffee, coffee mixes, ready-to-drink coffee and one-portion coffee. In Korea, Jardin supplies its products to large retailers such as E-mart as well as to airlines and dairy companies. Jardin made quite a splash in 1988 when it opened the country’s first speciality coffee store. Ever since, Jardin has been at the forefront of the development of a new Korean coffee culture, pursuing a rapid expansion course with double-digit growth rates. The key to this success is the company’s consumer-centric and sales-channel-focused product development strategy.

Opting in favor of Bühler

Jardin Co. Ltd. decided not only to buy a complete coffee processing line from Bühler, but also to equip its new plant with a TMR-125 roaster. The roaster is the heart of the plant and crucial for ensuring the high quality of the end product. During evaluation, roasting trials were conducted in our Customer Center in Sant’Agostino, Italy. Young-No Yoon, Chairman of Jardin Co. Ltd., explains: “Our exceptional growth rates during the past five years required us to expand our production plant. Since 2008, we have thoroughly evaluated the products of all major providers of coffee processing equipment. In the course of our analyses, we also evaluated the machines of Bühler and tested them in operation. What made us opt for a Bühler installation was our forecast that the Korean coffee culture would develop in the direction of an espresso culture. Today, we can see a shift in consumers’ preferences from coffee mixes and instant coffee to freshly brewed coffee. As a consequence, espresso coffee types are becoming increasingly popular. We are therefore focusing our research efforts on process solutions which give consideration to these market trends. We finally concluded that Bühler – also due to its partnership with Petroncini – would be the best option in order to offer our customers the original espresso taste.”

Espresso conquers Korea

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The TMR-125 roaster constitutes the heart of the new coffee processing system of Jardin Co. Ltd.
Flexible process and best bean quality
The taste quality and the physical properties of the roasted beans depend on the roasting profile. The roasting degree, roasting time, and the product temperature curve are the critical process parameters. The new IRC process control system of the TMR-125 roaster controls the product temperature with maximum accuracy throughout the roasting process. It modulates the heat input into the roasting chamber and ensures maximum reproducibility of the desired profile, batch by batch. This ensures a very high consistency of the bean quality, regardless of external conditions that might affect the process such as moisture variations in the raw coffee beans. Moreover, this profile control system enables Jardin to develop proprietary roasting curves in order to achieve distinct flavour profiles and physical bean properties. Thus, Jardin not only produces top-quality coffee, but also does this with maximum efficiency and sustainability. The TMR-125 achieves maximum thermal process efficiency.

Production starts on schedule
The time frame for realizing the green-field project of Jardin – less than ten months – was extremely tight. But the close collaboration between Bühler and Jardin allowed the building construction and machine installation work to be handled concurrently, despite record-low temperatures. The ambitious goal was therefore achieved on schedule: Following start-up with in-depth operator training, the system was commissioned in early May 2011. Sang-Yong Yoon, Director of Jardin Co. Ltd.: “Production started after a period of thorough testing and start-up. As we were facing a doubling of sales volume at that time, assurance of an adequate production capacity was crucial. Without the new plant, we would have been unable to cover the market needs.”

The TMR-125 roaster is equipped with a cutting-edge process control system and an advanced safety system.
Some technical modifications and a change in process parameters enabled the capacity of the production plant of Decas Cranberry Products Inc. to be markedly increased.

The target was clearly defined. “We must increase our production capacities,” explained Scott Petrinec, Plant Manager of Decas Cranberry Products Inc. in Carver, Massachusetts, to Bühler Aeroglide’s dryer specialists. But Scott Petrinec was not primarily thinking of increasing the size of the plant. What he had in mind was to boost the facility’s efficiency by making mechanical improvements and changing the process parameters.

Decas specializes in the growing, processing, and selling of various cranberry products. Set up in 1934 by Greek immigrants Nicholas, Charles, and William Decas, Decas Cranberry Products today processes 60 million pounds of cranberries a year. This makes it the world’s second-largest producer of dehydrated cranberries in addition to cranberry pastes, oils, powders, and concentrates. Decas supplies its products to retailers and the food industry in over 25 countries.

The task was no easy one, for the process applied by Decas is not typical of the industry. The specialists at Bühler Aeroglide therefore tackled the job “without blinders.” It did not take them long before they found a feasible approach. By making some technical modifications they created the conditions for fine-tuning the production process in terms of temperature and humidity. An initial test based on the new process parameters yielded positive results. Ever since, the plant has been operating with a 15% percent higher output. Scott Petrinec is happy: “Since the people of Bühler Aeroglide came to see us, we have been achieving incredible output. We are really glad to have turned to Bühler Aeroglide for assistance.”

(bos)
For years, GF Automotive AG has used Bühler two-platen die casting technology for manufacturing car components of aluminum and magnesium. The latest example is a complete Carat 200 Compact die casting cell for the Georg Fischer factory in Altenmarkt.

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Georg Fischer Automotive AG (GF Automotive) is an autonomous corporate entity within the international Georg Fischer Group. It focuses on the development and production of high-strength cast components for the automotive industry and its vendors. GF Automotive operates 12 production sites in Germany, Austria, and China with about 5500 employees. In 2010, the Automotive sector of Georg Fischer generated sales revenues of 1.55 billion Swiss francs.

**Proven capabilities**
GF Automotive possesses proven capabilities which have been internationally distinguished several times in the sand casting, gravity casting, and die casting processes for quantity production, as well as the processing of iron, aluminum, and magnesium as engineering materials. Its twelve factories manufacture about 500,000 metric tons of cast products a year. In Europe, GF Automotive is the acknowledged technology and market leader in numerous fields. Its principal markets are Europe and China. In addition, supplies also go to Japan and America. GF Automotive develops and manufactures products for almost all reputed carmakers and a number

“A dependable partner”
of well-known commercial vehicle producers. 80% of its output consists of
die cast products of aluminium and magnesium. Engine blocks, gearboxes
and clutch housings, oil sumps, steering columns, consoles, and struc-
tural body elements are just a few examples of products that are made of
aluminum and magnesium. In Europe, GF Automotive is one of the five
largest vendors of die cast parts to the automotive industry.

Research and development
The success of Georg Fischer as a specialist in the various casting
processes resides in its great research and development efforts. The
R&D competencies of GF Automotive are concentrated in Schaffhausen,
Switzerland and Suzhou, China. Some 70 specialists are employed in the
centralized research and development function. GF Automotive spends
about three percent of its total sales a year on research and development.
Significant development activities include component design, computer-
aided calculations, analyses, and simulations in addition to efficiency of
manufacturing processes. Other areas include materials and process
development plus materials and component testing.

Bühler as a technology partner
In the international automotive engineering industry, a strong trend exists to
use structural components for car bodies. Carmakers are also increasingly
using such components in the manufacture of volume models, cars made
in large production lots. Die casting offers clear advantages over other pro-
cesses. To take advantage of the die casting process, GF Automotive has
for years partnered with Bühler. “Bühler is doubtlessly a trend-setter in the
field of die casting and is at the forefront of this technology with its carefully
thought-out systems and processes,” explains Ueli Forrer, Head of Die &
Gravity Casting at Georg Fischer Automotive AG. “With Bühler, it is possible
to exchange views on a wide diversity of issues and projects also at the
R&D level. We greatly appreciate that.” GF Automotive and Bühler are
currently aligning their standards and defining joint standards. Ueli Forrer:
“It would be nice to standardize production to the point that we could
relocate it as required to any of our different factories.”

Thrilled by two-platen technology
What inspires Ueli Forrer most is the two-platen technology developed by
Bühler. “I do not doubt for a moment that two-platen technology faces a
very bright future. Fewer components on the die
closing unit lead to fewer failures, which has a
positive impact on uptime.” It is therefore not
surprising that various Bühler Carat two-platen
die casting machines are already in service in
different plants of GF Automotive. Thus, in the
years 2009 and 2010, two Carat 280 Compact
die casting cells went on stream in the factory
in Werdohl, Germany, and another two in the
foundry in Suzhou, China, in 2010. In Septem-

Georg Fischer
Georg Fischer is an international indus-
trial leader that specializes in three core
business fields: GF Piping Systems,
GF Automotive, and GF AgieCharmilles.
Governed by its philosophy “Adding
Quality to People’s Lives,” the company
with its products aims at helping enhance
the quality of life and satisfying the need
for mobility, comfort, and precision.
Founded in 1802, the company is head-
quartered in Schaffhausen in Switzerland
and operates over 130 affiliates around the
world. Of these, 50 are production sites.
The company’s roughly 13,000 employees
generate annual sales of about 3.5 billion
Swiss francs. (bos)
Bühler supplied a Carat 220 Compact die casting cell to GF Automotive’s factory in Altenmarkt in Austria. And today, two additional Carat installations are being built in Suzhou. In addition to high operating reliability, the low space requirement of the Carat is also an advantage. This is a decisive criterion in existing foundries in Europe, for instead of a 1300-ton machine, it may be possible to install a 2800-ton system. This boosts output per surface unit and meets the requirement for producing larger cast components.

Personal contact

But GF Automotive relies on Bühler for more than just its engineering qualities. “For such a business relationship, other factors are also important to us. They include an extensive range of products and services, consistent performance in the long run, support throughout the life cycle of a system, high dependability, and a high service level including spare parts supplies. Another important point is the global set-up of Bühler. Also personal contacts and short communication paths are essential.”

New Carat 200 Compact in Altenmarkt

The latest project handled by Bühler for GF Automotive is a new Carat 200 Compact for the Georg Fischer factory in Altenmarkt in Austria. Altenmarkt is located northwest of Graz, Europe’s Cultural Capital in 2003. The manufacturing facility in Altenmarkt is one of a total of five Georg Fischer plants in Austria. It is part of the Light Alloy Die Casting Unit and employs some 500 people who work in multiple shifts. Here, cast aluminum and magnesium compo-

“I am certain that we have a partner in Bühler that is a trendsetter in our industry and that I can fully rely on whatever and wherever it may happen in the world.”

Ueli Forrer
Head of Die & Gravity Casting, Georg Fischer Automotive AG.
nents are manufactured for the automotive industry. Dashboard supports, inner door components, consoles, paneling parts, hood compartment lids, and steering column sections made of magnesium. The project comprises a complete Carat 220 Compact die casting system. It has been designed for the production of suspension strut supports and simple structural components. Operation of the peripherals is integrated in the centralized control system. In addition, the control system saves all the casting parameters and all the quality data of each component. This ensures the retraceability of parts production. The new die casting system of GF Automotive was started up in record time, not least thanks to the reliable preparatory jobs done by the Georg Fischer employees. Supplied in August 2011, intensive training of all the operators and final start-up were completed as of the end of September 2011. Ueli Forrer: “This is further proof of the outstanding service that we receive from Bühler as our partner.” (bos)
In January 2010, a devastating earthquake destroyed the infrastructure of Haiti’s only flour mill. 22 months later, Les Moulins d’Haïti started up two new flour mills and one corn mill. Bühler designed and installed them in record time.

The abbreviation “LMH” stands for “Les Moulins d’Haïti.” LMH is the sole flour milling company in Haiti and of crucial significance for supplying the Caribbean country with flour for making bread, one of their staple foods. In 2009, LMH employed over 200 people, generating sales revenue of 100 million U.S. dollars. The earthquake that struck the country on January 12, 2010 destroyed the entire milling facility, which was located directly adjacent to the sea.

The earthquake which threw Haiti’s development back decades triggered a worldwide wave of support and solidarity. After the immediate actions of taking care of survivors and clearing of the main debris, the reconstruction of Haiti could start. While basic supplies to the country were ensured by the activities of numerous humanitarian organizations, the reconstruction of the milling facility was given top priority, because Les Moulins d’Haïti had been the country’s only flour mill. “After the terrible earthquake, we knew two things,” explains Christian Fucina, General Manager of LMH. “We had to rebuild the mill as quickly as possible in order to restore the self-sufficiency of Haiti, and we had to construct the new mill so that it would be capable of withstanding earthquakes.”

**International consortium**

In 1997, after the political situation had been stabilized in Haiti, Les Moulins d’Haïti was the first company to be privatized. At that time, an international consortium including Continental Grain Co., Seaboard Corporation, and Unibank acquired 70% of the LMH stock. The balance of 30% was retained by the government of Haiti. Unibank is Haiti’s largest bank. Continental Grain, with roots in Europe, is one of the world’s most important agri-business companies. In Latin America, Continental Grain focuses on basic agricultural businesses such as poultry production and processing, flour and feed milling, oilseed crushing and grain imports. It collaborates closely with the Seaboard Corporation in Ecuador and Peru. Seaboard, with origins in Kansas in the U.S., is an international group which, among other industries, operates a wide variety of food production facilities in North and South America, the Caribbean, and Africa.

For decades, Bühler has been a technology partner of both Continental Grain and Seaboard and is one of their preferred equipment suppliers. Christian Fucina: “We faced numerous challenges and had set ourselves ambitious targets. It was therefore clear to us right from the start that this major undertaking could only be handled by Bühler and the U.S. construc-
tion company TE Ibberson as partner for building a new mill in record time that was capable of withstanding earthquakes.”

**Low profile building – three mills**
The consortium of owners not only wished to replace the destroyed mill, but also wanted to incorporate the latest technology available. Due to advances in mill design, Bühler was able to increase the processing capacities of the original mills as well as add a corn mill within the same building footprint and utilizing less floors. This added capacity was a distinct benefit to the owners in view of the recent integration of Haiti in Caricom, the Caribbean free trade zone. It would give them the opportunity to export to other countries as well as allow them to substantially increase their animal feed production by using the additional bran output.

The goal was to replace the old mill, on its former site, with the largest and most advanced flour mill in the Caribbean, boasting an uncompromising level of sanitation based on international standards. Other targets that were specified by the client included top productivity, outstanding energy efficiency, and the highest possible product quality.

The project made provision for two flour mills with capacities of 600 t/24 h each, plus a corn (maize) mill with a capacity of 120 t/24 h. All processes in the facility were to be automatically controlled and monitored. Moreover, the number of floors needed to be kept to a minimum, and the structure had to meet Seismic Zone 4 building regulations. TE Ibberson was responsible for the design and construction of the buildings while Bühler was placed in charge of design, engineering, manufacturing, project management and installation of the processing systems including the electrical equipment.

**In record time**
A few days after the earthquake, Jim Gutsch, Senior VP of Engineering for Seaboard Corporation, met for discussions with the Bühler team. Work was immediately started on the layout and design of the new facility and with the assistance of Daniel Scheltus, Technical Director of Milling at Seaboard, a mere five months after the disastrous earthquake, the contracts were signed and the fabrication and rebuilding work could start. Christian Fucina: “We first had to remove the destroyed mill and grade the con-
The earthquake
On Tuesday, January 12, 2010, at 16:53 hours local time, one of the severest earthquakes in the history of North and South America struck the western part of the Caribbean island of Hispaniola. The earthquake, which within a matter of seconds put an end to the hopes of up-and-coming Haiti, had an intensity of 7.0 on the open Richter scale of the United States Geological Survey (USGS). The epicenter was located some 25 kilometers southwest of Port-au-Prince, the capital of Haiti. The devastating earthquake lasted for one minute and claimed 316,000 deaths according to the Haitian government. It destroyed the entire infrastructure in a large radius around the epicenter and leveled about 250,000 accommodations and 30,000 businesses. (bos)

Construction site. Then the subsoil was tested. Finally, a temporary man-camp was erected on site for the work crews. Then construction on the new building structures began.” At the same time, repairs were started on the damaged pier, the wheat intake section and the bulk storage installations. By July 2011 the construction work had advanced sufficiently to the point where Bühler could start with the installation of the equipment. Installation was completed within record time so that the new LMH mill is scheduled to go on stream when this issue of Diagram appears respectively in the subsequent weeks.

Positive responses
The two new flour mills of Les Moulins d’Haïti have been designed specifically to produce bread flour. The corn mill will produce different types of corn grits and cornmeal. In addition, the plant has a number of notable features. For example, all the processes in the entire facility are controlled and monitored by the Bühler WinCos automation system. The design and diameters of the raw wheat bins, the tempering bins and the flour bins were selected so that they could be shipped by ocean-going vessels. At the end of the process, the flours and semolinas are bagged on large bagging carousels. The products are distributed to customers on land way by trucks.

The initial responses to the new mill are positive throughout. Christian Fucina: “On the one hand, we are very satisfied with the pace at which installation and start-up took place. Putting such a plant into operation within such a short time under the conditions prevailing in Haiti is a formidable accomplishment. On the other hand, we have found in short time that we have been operating the mills that our quality and sanitation requirements have been entirely fulfilled.” (bos)
Taking nut sorting to new peaks

Maximum safety and high efficiency in the removal of defective nuts, Hygienic design, dust management system and state-of-the-art climate control – some of the new features of the purpose-designed SORTEX E1C nut sorter.

“In developing our latest SORTEX E1C optical color sorter, we had nut processors firmly in mind. The machine offers them the strict quality control and food safety hygiene they need,” explains Bühler Sortex product manager Faisal Baig. “What makes our new sorter so special is its combination of different technologies, which opens up unrivaled sorting capabilities.” The new Sortex E1C brings together broad-spectrum lighting, bichromatic cameras, a further enhanced InGaAs system plus the PROfile shape detection technology. The combination of these features allows accurate detection of subtle defects and of hard-to-differentiate foreign material. The unit opens up entirely new perspectives also for peanut processors: In conjunction with filters, the broad-spectrum lighting system is capable of detecting subtle yellows and insect spot damaged nuts with astonishing accuracy. The new sorter’s performance is second to none when it comes to dusty products or products with loose skins. Falsey rejected product is minimized. The new sorter has an open design, which makes it easy to clean. All the parts that come into contact with food can be washed down. “Other sorters cannot match the SORTEX E1C when it comes to processing fragile products either and that means minimal breakages, which helps processors to maximize their efficiency and profits. This fabulous processing solution will usher in a new era for high-speed dry food optical sorters. The SORTEX E1C really is in a class of its own,” Baig concludes.

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Understand – advise – implement: SOLIX is the integral approach to optimizing existing flour mills, both in terms of business result and technology. Higher profits are guaranteed.

“Solution X” or in short “SOLIX” is the name of the Bühler consulting service offered to future-oriented grain mill operators. “With SOLIX, we are offering mill owners a service that will help them find the best possible solution for optimizing the costs of their plants,” explains Walter Eugster, Head Process Technology in the Bühler Grain Milling business unit. “SOLIX is a structured package approach developed by our Grain Processing Customer Service department. It comprises the customized analysis of an existing mill and as the consulting result a package of measures designed to fine-tune its production processes. The Bühler SOLIX service is aimed at existing plants. Added customer value is generated on the basis of plant performance and yield, uptime and operating cost optimization, plus energy savings and financing advantages. SOLIX offers customers profit options in conjunction with minimum plant downtimes, integrated service solutions for maximizing plant availability, and – if required – investment-friendly financing models. New insights such as trends and technological developments are immediately incorporated in the consulting approaches. This enables Bühler to satisfy tomorrow’s customer needs even today.”

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“We have been able to improve our profits on a sustainable basis through a higher yield and energy savings.”

Gu Xing (third from the right), owner of the Xing Yuan Flour Mill in Dongtai, China.
Expert team
The basis for the success of this Bühler service is provided by the visit of an expert team to the customer’s site. Walter Eugster: “First we perform a one- to three-day assessment at the customer’s site. It is attended by experts from the various specialist functions beside the local customer supporter – a head miller, a technologist, and if necessary an automation specialist and a service engineer.” This team checks the condition of the mill and together with the customer establishes a concept for fine-tuning its performance by adjusting the range of equipment installed and the processes. A special information technology tool enables the expected savings to be shown at the customer’s local site. In addition, the experts determine the required capital investments and the return on investment (ROI), which is of interest to the customer.

Satisfied customers
Customers are thus offered everything within a very short time that they need for making their decisions. Walter Eugster as an expert has already carried out over 20 such SOLIX assessments in Europe, China, and North and South America and then implemented the results in line with the individual customer needs. Customers’ responses are positive throughout. For example, Gu Xing, owner of the Xing Yuan Flour Mill in Dongtai in China, who says: “We are extremely satisfied with the results of the sound consulting services and the subsequent upgrading. The increased yield and the energy savings achieved have enabled us to improve our profit on a sustainable basis and thus enhance our competitiveness.”

(bos)
Bühler recently dedicated a new test laboratory in Wuxi, China that is equipped with a pilot extrusion system. This installation is used in collaboration with customers to develop new foods for the local market. In addition, the facility serves as a training and seminar center.

Other cultures – other eating habits. In order to better take account of the local and regional eating habits and satisfy the related requirements, the Bühler Pasta & Extruded Products business unit is planning to set up regional extrusion laboratories that are provided with state-of-the-art equipment.

The first one was opened in Wuxi in China in August 2011. It is provided with cutting-edge equipment. Christopher Rubin, Head of Product Management, explains that the main purpose of this “laboratory for Chinese culinary culture” is to engage in research and to develop new extruded foods for the Asian markets. In the new facility, Bühler customers from the food industry also learn about the additional possibilities that a modern extrusion line offers.

100 to 800 kilograms per hour

The new lab, which is headed by food technologist Allen Li, allows Bühler to support its customers in developing new products. Christopher Rubin: “The laboratory is equipped with a complete twin-screw extrusion line with a capacity of 100 up to 800 kilograms per hour. It is an ideal test facility for our customers where they can test new formulas and products under real-life conditions.” As examples of new products, Rubin mentions textur-
ized soy products serving as meat substitutes or reconstituted rice grains that can be fortified with various additives.

**First seminar**
The new extrusion laboratory in Wuxi is also used for holding courses and seminars. In a first two-day seminar that was recently organized, 40 managers and technicians from 16 large and mid-size Chinese food producers were initiated into the secrets and the wide variety of possible applications of the extrusion process. They eagerly followed the descriptions given by the Bühler experts of the possibilities offered by extrusion in making a broad range of products. The attendees of the seminar were amazed to learn about the wide spectrum of wholesome foods that can be produced at low cost from different raw materials on a single system.

**Production systems meeting local needs**
Concurrently with the expansion of the services offered in the Asian region, Bühler has also developed a new extrusion system matched to the local requirements. Christopher Rubin: “We have learned from our flagship, the PolyTwin twin-screw extruder, and developed a new extruder especially designed to satisfy the needs of our Asian customers. This machine, called the CompacTwin, is available in two sizes: 250 to 800 kg/h and 500 to 1500 kg/h; it has a simple control system and is very handy. It is the ideal alternative to the all-rounder PolyTwin for customers with a limited product range. Though it offers fewer degrees of freedom, it meets highly stringent quality and throughput requirements.” As an ideal supplement to the CompacTwin, Bühler offers both a suitable dryer and raw material and finished-product handling systems. The CompacTwin, the dryer, and the handling system components are manufactured as a complete system in China especially for the Asian markets. (bos)
Sayga Flour Mills has been a Bühler customer since it was founded in 1996. The rapid development of this leading North Sudanese milling company is closely related to Bühler. This started as a partner in the field of flour milling, then during the construction of a port terminal in Port Sudan, and finally the establishment of the company’s own pasta factory. And now, Bühler is again partnering with Sayga as this company enters the field of animal feed production.

**Production center near Khartoum**

Sayga operates its own port installation in Port Sudan on the Red Sea. Three ship unloaders supplied by Bühler, with a handling capacity of two million tons per year, ensure efficient discharge of ships. For intermediate storage, a bulk grain storage installation with a holding capacity of 150,000 tons is available. From the rail terminal the grain is moved directly from the Sayga port to the Sayga production center north of Khartoum. Some 150 company-owned hopper cars and six locomotives plus a large fleet of trucks are available for transporting it.

On the company premises near Khartoum, the capital of North Sudan, Sayga operates five modern, fully automated Bühler grain mills with a total processing capacity of 2350 t/24 h. These installations produce flour, semolina, and bran catering to the different needs of retailers, industrial users, and food processors. Part of the semolina is processed in the pasta factory, which is also located in the Sayga premises. On its three Bühler-supplied short-goods lines, Sayga produces 10,000 kilograms of pasta an hour for the national market.

**Entering the animal feed market**

In Sudan, Sayga operates a number of large farms. They grow different grain varieties, clover, and soybeans and breed poultry and cattle. Up to now, DAL purchased the animal feeds it needed in the national market. As part of its continuous diversification effort, the group management decided to start its own feed production activities. “The production of animal feeds is a demanding task,” explains Khalid Ismail Hamed Al-Rufai, Operations Manager of Sayga Flour Mills. “Our farms grow the necessary...
raw materials. And we are convinced that our years of experience will enable us to produce the top-quality feeds that we need for our own livestock breeding activities as well as for customers.” The establishment of its own feed production activities is “very important,” continues Khalid Ismail Hamed Al-Rufai. “For Sayga, the manufacture of formulated feeds will be one of the core growth areas over the next few years. Moreover, compound feed production excellently matches the strategic orientation of our group.”

**Three stages**
The large Sayga premises offer ample space for building the new feed production plant. Sayga plans to construct a total of three feed mills in three stages. A new building structure was erected for housing the first stage. At the same time, the foundations were laid for the second stage. The first stage, which was completed in the summer of 2011, comprises a 10t/h feed mill for making formulated poultry and cattle feeds. In a subsequent phase, production in the first plant will be limited to poultry feed. Plants two and three will then manufacture the cattle feed.

**DAL-Group**
The new feed mill is part of the Sudanese DAL Group. The DAL Group was set up in 1951 under the name Sayer & Colley. Under the direction of Daoud Abdel Latif, the Group experienced sharp and sustained growth. Since the decease of Daoud Abdel Latif, his initials have been featured in the name of the DAL Group. Today, the DAL Group is one of the largest and most diversified private corporations in Sudan. DAL is made up of a large number of companies operating in the consumer goods, industrial, and real estate markets.
When the first stage was constructed, the plant section for receiving the raw materials was sized in wise foresight with the final stage including the three mills in mind. In addition, the existing bran bagging line was also relocated from the flour mill to the new feed mill section in the first stage. To date, Sayga has sold the bran obtained in the flour milling process to outside companies. Now that it has its own feed production plants, most of the bran will be processed into animal feed. Only a small proportion will be bagged for sale. The final construction stage will also include a new complete feed laboratory.

**Swiss standard**

The new feed mills of Sayga will be based on Swiss standards. The raw materials will be received in bulk trucks and Big Bags. The ingredient bins are designed to hold grain, corn (maize), oilseed extraction meal, bran, minerals, and premixes. From the ingredient bins, the raw materials – controlled by the Bühler WinCos automation software – are automatically retrieved and weighed in accordance with the specific product formulation. Grinding is done on hammer mills of type Vertica. The ground raw materials are then transferred to a batch mixer, where the minor ingredients and liquids are added. Following thorough intermixing, the finished animal feed is dried and either placed in intermediate storage bins in the form of meals, or processed into pellets in a pellet mill. The production process ends with the bagging system. Here the meals or pellets are packed into 30-kilogram bags and are then moved to a high-bay warehouse or loaded directly by belt conveyors onto trucks.

The first stage of the new feed production installation is running to the full satisfaction of Sayga Flour Mills. Even during start-up of the first stage, Sayga triggered the construction of the second stage.

“**We have entertained a long and successful relationship with Bühler. And we will continue to build on this basis also in the future.**”

Khalid Ismail Hamed Al-Rufai,
Chief Operations Manager Sayga Flour Mills
Successful pasta seminar in Italy

From grain processing to pasta production: The Bühler pasta seminar held in Campobasso in Italy last October was attended by over 30 representatives from a wide variety of Italian pasta-makers from central and southern Italy. Tours of the plants of Pastificio La Molisana (photo), Molino Ferro, and Pastificio Rummo plus a meeting with representatives from the Faculty of Agricultural Sciences of the Università del Molise provided examples and the basis for discussing the latest trends in the field of pasta production. For the first time ever at a pasta seminar, grain processing issues were also treated. The focus here was on the effects of the grinding process on subsequent use of the semolina for pasta production. Other subjects of a more basic nature included the physico-chemical fundamentals of dough composition, drying and stabilization of pasta, and production of gluten-free pasta.

Large order from Wilmar

Bühler has been awarded a contract by Wilmar International for constructing three flour mills with a total capacity of 2500 t/24h. Two of these facilities with capacities of 1000 t/24h each will be built in Indonesia, a smaller one with 500 t/24h in Vietnam. The Wilmar Group is one of the largest oil, flour, and rice mill operators in Asia.

New office in Togo

In August, Bühler opened a new office in Lomé, the capital of Togo. Olivier Marion, who has been in charge as Area Sales Manager working out of the Bühler affiliate in Johannesburg for the regions in West and North Africa since 2001, will from now on support his market territory out of Togo. His focus will be on the activities of the Bühler Grain Processing and Food Processing divisions.

Bühler at the GIFA 2011

GIFA, the international trade show for foundry technology, cast products, and casting technology is held in Düsseldorf every four years. It is the world’s largest exhibition of its kind and sets the pace in the industry. At the GIFA 2011, the Bühler Die Casting business unit displayed a lean die casting cell of type Carat 130 in its 620 square-meter booth as an example of its new two-platen technology. It generated keen interest among the specialist public.

Change at Bühler in Paris

A change has taken place in the top management of the Bühler affiliate in Paris. On September 1, Christophe Stoos (photo) succeeded Jean-Michel Bernical, who has been placed in charge of the new Grain Logistics business unit. Christophe Stoos is an engineer who has been with Bühler since 2005.
World’s first “unmanned” feed mill

Since May 2011, the feed mill of UFA in Switzerland has been the world’s first facility of its kind to operate unmanned. From 9 p.m. through 5 a.m., the facility produces formulated feeds without the attendance of any operating personnel. During this period, it is fully automatically controlled and monitored by the new Bühler process control system. This cuts the manpower requirement as well as the operating costs.

UFA is a leading Swiss animal feed producer. At its site in Sursee, the company operates a feed mill that has been purpose-designed for making poultry feeds. Its eleven employees produce some 85,000 metric tons of poultry feed a year on one feed manufacturing line in three shifts on five days.

New control system and higher capacity

The UFA feed mill in Sursee was built in 1965 and equipped with a new control system in 1993. But this system had gradually become obsolete, and 100% service readiness was no longer ensured. Peter Hofer, member of the UFA corporate management and head of production, took this as an occasion to review all the mill’s operations. “Together with outside specialists, in-house experts, and the factory workforce who operate the production systems day in, day out, we reviewed the production processes and developed a three-part project. The individual parts were the following: fundamental updating of the control system; measures for fine-tuning the production capacity of the pellet mill; and retrofitting of the control system to allow unmanned night-time operation.” The company management earmarked two million Swiss francs for implementing this three-part upgrading pack. The payback on this capital investment, says Peter Hofer, “was as short as two years.”

UFA wants Bühler standards in all its factories

Following thorough investigations, the UFA top management decided at the end of 2008 to entrust Bühler with rebuilding the feed mill in Sursee. “Our decision in favor of Bühler was based on strategic considerations,” explains Peter Hofer. “The control systems of all our production plants were supplied by Bühler. They have proven their worth in day-to-day production. Support and maintenance are provided by a single supplier. And all our employees will now work with the identical user interface, which makes it easier to exchange personnel between the individual plants.”

The rebuilding work started on May 1, 2009. For this purpose, the feed mill was shut down for two weeks. “We prepared the shutdown with great care,” says Urs Steiner, production manager of the UFA plant in Sursee. “Before starting, we loaded our storage bins and those of our customers

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Urs Steiner, production manager of the UFA factories in Sursee, inside the control room of the feed mill.
to the top and temporarily relocated production activities to another UFA factory."
In the two weeks, the retrofit work on the control system and measures for increasing the capacity of the pellet mill were carried out. For fine-tuning the production process and in order to allow the change-over to multistage grinding, which slashes electric power consumption, a new crumbler was installed. The subsequent change to unattended night-time operation was made possible by thoroughly reconditioning all the existing sensors and incorporating numerous new control and monitoring devices. Thus, a new so-called “Camsizer” checks the quality of the grinding process and the finished products.

Fenaco and UFA
UFA is an important part of fenaco, the mutual-assistance cooperative of Swiss farmers. Fenaco, an agribusiness corporation, supplies farmers with production tools and buys, upgrades, and markets their produce. In addition, fenaco operates two retailing chains (Volg, LANDI) and its own chain of gas stations (AGROLA).
The abbreviation “UFA” stands for “Union des Fédérations Agricoles.” UFA was founded in 1958 and is Switzerland’s leading company in the field of animal nutrition, supporting livestock breeders with products and services. UFA has its headquarters in Herzogenbuchsee near Berne and operates eight production sites and service centers throughout Switzerland. In all, UFA has 340 employees.
But the crucial job was to retrofit the control system of the feed mill. “The old Siemens S5 control system was replaced by a new S7 unit,” explains Philipp Staerkle, PLC programming team manager at Bühler. “This control system switches the individual processes and pieces of equipment on and off. The control system receives the commands for doing this from the master PC-based process control system supplied by Bühler.”

Smart control system makes its own decisions
The new automation system is based on the Bühler standard control system. But one of the challenges that the team faced was to program the system to allow unmanned night-time operation. UFA specified that the mixing line as well as the pellet mill-expander line were to operate fully automatically during the night shift. This means that the control system would have to switch the plant to a secure mode in the event of operating trouble. All faults detected would have to be automatically acknowledged by the system and corrected. In addition, the automation system would have to ensure production reliability and personal safety at all times. Last, not least, the new control system would have to alert the stand-by staff by SMS, and remote maintenance had to be possible. “In unattended service, the control system must make the decisions which are otherwise taken by the experienced user,” says Philipp Staerkle, explaining the basic principle. “In order to enable the control system to do this, it must receive numerous data from the sensors and respond to these signals as specified.” For example, sensors monitor the temperatures and vibrations in the hammer mill, the mixer, and the expander as well as in the bearings of the machinery.

A great deal of attention was paid to safety and reliability in programming the “unmanned operating mode” function. Philipp Staerkle: “All building floors are monitored by motion detectors. The stand-by personnel summoned to the plant in the event of an alert is monitored inside the plant by a dead-man’s system. A special information system supplies the fire fighters, the first-aid doctor, and the operators with the necessary information in case of an emergency.”

Gradual phase-in
Following the two-week shutdown, UFA could restart production in its upgraded feed mill. However, unmanned night-time operation was postponed for some time. Urs Steiner: “We first wanted to familiarize ourselves with the new processes and procedures in regular service and fine-tune them. When we found that everything was running as planned, we got ready for gradually phasing in unmanned night-time service.” The reasons for this step-by-step procedure were twofold. On the one hand, the company wanted to be sure that the system would work smoothly. On the other hand, the plant operators had to get into shape for fulfilling their new functions and handling the new procedures. Urs Steiner: “Some of my people have regularly worked night shifts for decades. This produces a special pace of living that you cannot simply do away with from one day to the next.” After
the new control system had proven its dependability in daytime operation, the first step could be made. For three weeks, the control system was switched to the unmanned operating mode from 9 p.m. through 5 a.m. But during this period, the production manager and his deputy alternately remained in the plant throughout the night in order to monitor automatic operation. Fine adjustments were made to the automation system on the basis of their experiences. After this three-week test phase, the second step was initiated. During the six weeks that followed, the operating personnel monitored night-time production in turns as before. This allowed everyone in the eleven-member team to satisfy themselves of the operating reliability of the new system.

**Successful rollout**
The UFA feed mill in Sursee has been running in the unattended night-time mode since May 2011. Since then, the man in charge of the night shift has prepared night-time production from 1 p.m. through 9 p.m. He then leaves the plant, acting as a standby until the next shift starts in the morning at 5 a.m. In case of an emergency, he will be alerted by the Bühler control system via cell phone. The experiences gained with the new system are very encouraging. Urs Steiner: “Everything is running to our full satisfaction. On average, we receive a fault message every two weeks. These irregularities can typically be corrected by remote access from at home using a laptop.”

Production manager Urs Steiner is very happy about the completion of the entire renewal project for “his” feed mill. “As far as I know, we are the first feed mill worldwide that operates throughout the night without requiring any operator attention.” He continues by saying that the meticulous planning of the rollout during almost two years has paid off. “We learned a great deal during this period and in particular gained confidence in the plant and the new control system. Returning to the old shift operating mode is not an option.”

(bos)
Solar Energy Racers (SER) is the name of a team of Bühler employees who made a far-reaching decision more than a year and a half ago: “We will take part in the World Solar Challenge 2011 in Australia.” The race is acknowledged to be one of the most grueling events of its kind worldwide. It runs 3000 kilometers right across the country from Darwin to Adelaide.

For Bühler, sustainability and alternative energy production are high priorities. Everything started a year and a half ago in the Advanced Materials division. Mobility and energy are two key issues guiding the activities of the division. So, what could better embody its strategy than a high-tech solar-powered vehicle that would compete in a race with contestants from all corners of the world? It was not long before this idea of a few persons gave rise to a project team supported by the division management – the “Solar Energy Racers” were born.

The Solar Energy Racers project is an leisure-time undertaking. In the project phase, teams were formed which focused on the various issues involved: body, powertrain, cockpit, dynamics, electronics, racing strategy, marketing, and finance. The Marketing and Finance teams started looking for sponsors to fund the project and to calculate the costs. In regular meetings, the results were compiled, and “SER 1” – that is the name of the vehicle – gradually became a reality.

The result: SER 1 weighs a mere 150 kilograms and is powered by a brushless wheel hub motor with the power of a hair dryer. The body consists of carbon-fiber reinforced plastic whose shapes were designed and built by the team members themselves. The solar energy is produced in monocrystalline silicon solar cells measuring six square meters and stored in lithium-ion batteries. SER 1 reaches an average speed of 80 km/h.

It would have been impossible to realize the project without the support of some 30 volunteers. From apprentice to retiree – everyone helped to make sure that SER 1 would be able to start the race on October 16, 2011. It also costs a few sleepless nights. But all the efforts are now forgotten when the results are considered. In addition, the team could rely on financial support or services of customers and suppliers of Bühler – and of course of Bühler itself.

37 teams from 20 countries took part in the World Solar Challenge, most of them from universities. As the only Swiss team, the Solar Energy Racers as a "leisure-time group" are a double exception. But also because three ladies alternately sat behind the steering wheel …

“Best Newcomer Award”
The Solar Energy Team has mastered the race right across Australia with flying colors. Its members struggled with bush fires, a blowout, and extremely nasty weather. Due to days of cloudy weather, the battery was taxed to its limits. Despite all these adversities, SER 1 achieved a respectable ninth place in the provisional overall ranking. In the “Production Class” category, the team even ranks third. This category includes vehicles which are exclusively equipped with components readily available in the marketplace. For this, the organizers of the race presented the Solar Energy Racers the “Best Newcomer Award”.

The Bühler Solarmobil on a trial run on an airfield in the Swiss Alps.
Bühler acquires production capacities in the Czech Republic

Bühler has acquired two production sites from the Swiss textile equipment manufacturer Rieter in Žamberk and Ustí nad Orlicí in the Czech Republic. The two facilities together employ 315 persons. Up to now, they have operated for Rieter as manufacturers of assemblies, components, and sheet metal parts. In addition, they gradually built the third-party business with various industries over the past years. Rieter plans to continue to utilize the factories as suppliers for textile equipment construction. Bühler will retain all the Rieter employees and also intends to make additional investments in the Czech site. Bühler’s strengthening of its production capacities in Europe and especially in East Europe constitutes a systematic continuation of its strategy of manufacturing its products as closely as possible to the marketplace with high efficiency and at optimal cost. At the same time, the acquisition in the Czech Republic will enhance Bühler Group’s flexibility by enabling its envisioned growth to be generated with in-house resources. Moreover, it will also allow room to be created to further improve cycle times. Because the production sites were operated by Rieter up to now, Bühler will benefit from a high quality standard, know-how, and familiarity with Swiss corporate culture. (ca)

New head of the region Middle East/Africa

In August, Andreas Flückiger took charge of the Bühler sales region Middle East/Africa at the Bühler headquarters in Uzwil, Switzerland. Over the past eight years, Flückiger headed the Bühler region South America with great success. Andreas Flückiger is a Swiss citizen who grew up in the Democratic Republic of Congo. He has lived for 25 years in Africa, of which eight in Morocco. Beside German, French, and English, Flückiger also speaks Spanish and Arabic. (ez)

New head of the Chocolate, Cocoa & Coffee business unit

A change has taken place in the management of the Bühler Chocolate, Cocoa & Coffee business unit. Effective August 1, 2011, Serge Entleitner succeeded Edi Boller, who has taken charge of the Bühler region of South America. Serge Entleitner was born in Austria in 1964. He graduated in social and economical sciences from the University of Innsbruck and then continued his management education at the Universities of St.Gallen and Constance. Before switching to Bühler, Serge Entleitner was member of the group management of Conzzeta AG, for which he successfully built an international business field. Serge Entleitner lives in Koblach, Austria. He is married and has a daughter. (em)

New office in Bangladesh

Bühler has had its own office in Bangladesh since July 2011. The new Bühler agency in Dhaka is headed by Imran Uddin. A graduate engineer and industry manager, he is in charge of sales and service in Bangladesh. (dm)

Bühler at trade shows

The Bühler business units regularly attend trade fairs across the globe. You will find brief reviews of past exhibitions as well as notes on future appearances at trade shows at www.buhler-group.com/events. (bos)
Diagram No. 24

In the 24th issue, the editors of the Diagram for the first time treat a focal subject in the magazine. On seven pages, the Diagram issue No. 24 discusses the Italian grain milling industry. In the year 1959, Italy had 1983 milling companies with a total grinding capacity of 12.5 million metric tons of grain. Of these, 1493 were flour mills (total capacity 7 million tons), 220 durum mills (2.5 million tons), and 270 combination mills. This statistic does not cover small-scale mills. The unknown author of the article believes that with a total population of about 50 million, the country has quite some excess capacity and will inevitably face cut-throat competition. The article continues to say that a company can only survive in this situation by always maintaining its plant at a state-of-the-art level so as to be capable of making high-quality products at minimum cost. As a consequence, the author explains, the Italian milling industry is very receptive to innovations. In addition, he says that you can feel a natural enthusiasm for technical developments in Switzerland’s southern neighbor. After analyzing the Italian grain milling industry, the author looks at the development of the Bühler affiliate in Italy – in Milan since 1900 – and the progress made in milling technology by the close collaboration between Bühler and its Italian customers. In the second part of the article, a number of modern Italian milling projects are presented, including S.p.A. Fratelli Pardini in Lucca, Molino Pastificio Ponte san Giovanni in Perugia, and Grassi Silvio in Fraore near Parma. (bos)