Energy efficiency: Using less energy for the same result
Siemer Milling: Low operating costs – top flour quality
Handtmann: A giant in a compact form
Dear Readers

There are many reasons for saving energy. But often, costs trigger the search for possible ways to cut energy consumption. In addition, legislators influence the behavior of companies and consumers through new, more stringent regulations. But not least among the reasons is the responsible attitude of many businesses which want to use existing resources sparingly. We at Buhler have concerned ourselves for years with the question of how to cut energy consumption. We found that as a manufacturing company we could contribute to the global reduction of energy usage by taking appropriate measures. But we have also realized that we can conserve much more energy by continuously refining the processes, systems, and equipment that we produce so that they use less energy and are thus more energy efficient.

We invite you to read more about the subject of energy saving and energy efficiency in this issue of Diagram.

We wish you much pleasure!

Calvin Grieder, CEO
Saving energy by increasing energy efficiency: Although energy is not the most important production factor in the food industry, Bühler has concerned itself in depth with the question of how to further reduce the energy consumption of the plant and equipment it manufactures in the interest of its customers.

Of the total annual energy consumption on our planet, electric power currently accounts for 68 exajoules or 15%. Of these 68 exajoules, industry uses about half. In order to find a reasonable approach to using our finite energy resources, also industry is called upon to help conserve energy. In this sense, Bühler has assigned a project team to deal with the subject of “energy” and to show where and how Bühler can help reduce global energy consumption or at least slow down its increase.

Reasons for energy saving
The work group entrusted with this job gathered all the relevant facts and presented the results in a special exhibition in the new Customer Center on the occasion of Bühler’s 150-year anniversary. The team based their work on the reasons for using energy sparingly. Fritz Langenegger, head of the work group: “Despite wide fluctuations in energy prices – especially crude oil – the trend has been clearly pointing upward since the year 2000.” In other words, cost is the most important reason for industry to conserve energy.

The second most important reason is more stringent legislation. In order to protect the environment, governments in most countries are introducing increasingly rigorous regulations and thus putting more and more pressure on energy producers and consumers to cut their energy usage. Last, not least, businesses can expect to polish their image in today’s increasingly energy-sensitive society if they can present themselves as above-average energy savers.

Energy costs depend on the specific industry
The extent to which a lower energy consumption will enable costs to be reduced depends on a large number of factors. Therefore, the share of energy relative to the total production cost varies very widely from one industry to another. In metal production, for instance, energy consumption accounts for almost one third of total costs. Other industries that are almost as energy-intensive include the foundry business, bulk chemicals manufacture, and paper production. On the other hand, energy accounts for “only” 3.9% and 3.7% of total costs in the automotive and metalworking industries. In the “food and tobacco” category, to which most Bühler customers belong, 3.9% of total operating expenses are for energy. And in the field of mechanical engineering, which is Bühler’s domain, the statistics of the Global Institute of Economy in Hamburg (Hamburgisches

For more information on Energy Efficiency, please contact:
Fritz Langenegger
Energy Efficiency Project Manager
at Bühler in Uzwil
T +41 71 955 21 01
F +41 71 955 17 00
fritz.langenegger@buhlergroup.com

Example Nr. 1: Electric motors

Electric energy is a crucial factor in global industrial production. Every year, some 19,000 TWh of electric power are consumed around the globe, which equals about 15% of the total primary energy used annually by humankind. Of this, industry accounts for roughly 50%. And of these 9,500 TWh of electric power, some 65% or 6000 TWh are consumed by electric motors. This means that the electric motors applied in industry use about 4% of the total primary energy consumed by humans.

Electric motors are key elements in the plant and equipment that Bühler supplies. Year in, year out, Bühler installs several thousand electric motors of various sizes. This adds up to a total drive power of 220 to 250 MW that are installed in the workshops of Bühler, which together consume about 6,000 GWh energy. Considering that an electric motor running continuously at its rated load will after two months at the latest have consumed as much power as it cost to buy, it becomes clear where and how Bühler can offer its customers direct support in their energy saving efforts: By using cutting-edge motor technology of efficiency classes IE3 (Premium Efficiency) and IE2 (High Efficiency). This consideration becomes all the more important as soon as we look at the life cycle costs of an electric motor. The initial cost of a motor range from 2 to 20%, depending on its size. The share of the investment cost relative to the total lifetime cost decreases as the size of the motor increases. So: The extra money spent on motors of efficiency classes IE2 and IE3 will always pay off in the form of energy savings.

Measures for increasing the efficiency of electric motors.

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Weltwirtschaftsinstitut) say that energy accounts for a mere 1.6%.

**Energy as the third priority**

In assessing energy costs, we must also bear in mind that energy expenditures of most Buhler customers account for only about 3% of their total operating expenses. Fritz Langenegger: "In the field of grain processing, about 80% of all costs are accounted for by raw materials. Roughly 10% is spent on capital investments and financing, and the balance of 10% on direct operating costs. This includes human resources costs of 3%, energy costs of 3%, and sundry costs of 4%. This means that in the food industry energy expenses only rank third."

Nevertheless, these 3% must not be neglected, for raw materials prices are essentially impossible to influence and are therefore the same for all players competing in the marketplace. "On the other hand, energy costs can be directly influenced by taking appropriate measures and – if properly done – without affecting the quality of the end product," explains Fritz Langenegger.

**Thinking for customers**

Needless to say that the work group «energy efficiency» also concerned itself with the question as to where energy saving potential still exists inside the Buhler organization itself. The result is clear. "Because Buhler uses relatively little energy, the potential for conserving energy is small," says Fritz Langenegger. "According to our calculations, the energy consumed in the manufacture of our plant and equipment is 30 to 50 times lower than the energy used later on by the plant and equipment produced."

Buhler CEO Calvin Grieder therefore concludes: "If we want to help save energy on a global scale, we must not primarily focus on our own manufacturing activity, but build our plant and equipment so as to enable our customers to cut their energy consumption."

**Potential savings**

The work group headed by Fritz Langenegger has documented these considerations by figures. "We found that our customers could conserve about 6.5 GWh energy every year if we improved the energy efficiency of all the plant and equipment that we manufacture in one year by just one percentage point. That would cut their energy bills by almost one million Swiss francs annually."

And if the energy efficiency of all Buhler-supplied plant and equipment in service around the world were to also be improved by one percent, a total of 130 GWh per annum could be saved. That, after all, translates into potential savings of 13 million francs (maximum).

**Where and how?**

But the engineers and technicians in the work group energy efficiency did not content themselves with taking stock of the current situation. "We delved into the question as to where our customers have possibilities of cutting energy consumption along their production chains and how we might best tap this existing potential," says Langenegger, describing the team’s procedure. "We identified potential in connection with the energy supply, the individual components, entire machines, and finally also the production processes and maintenance."

In order to optimize the energy supply and if possible to avoid high-rate power peaks, the energy consumed must be recorded and visual-
Every year, humanity consumes about 450 exajoules of primary energy. 450 exajoules are 450,000,000,000,000,000,000,000 or 450 x 10^18 joules. But we humans can perceive “energy” only indirectly. It does not help us laypersons very much, then, to learn that one joule is equal to the energy contained in one drop of gasoline (0.03 ml). The energy that humankind consumes worldwide every year eludes the power of our imagination. And when we hear forecasts predicting that global energy usage will double by the year 2050, this simply means that this quantity becomes “twice as unimaginably great”. (bos)

**Energy-efficient components**

One of the main areas with a high savings potential that the project team identified are components. “The selection of the right components allows lots of energy to be conserved”, says Fritz Langenegger. “However, the aim is not to install the best parts everywhere, but to choose the component optimally suited to the fulfillment of the specific function.”

An important element in almost all Buhler machines are the electric motors. “A mere 2 to maximum 20% of the total life cycle cost of a motor is accounted for by the procurement cost and the balance is operating expenses in the form of power consumption. It is therefore worth the trouble to pay attention to quality in selecting a motor,” says Langenegger. Beside the selection of the optimal motor, the application of a frequency converter also strongly suggests itself. It ensures that the motor will not operate at a higher rpm than needed at any particular point of time. The result: Lower energy consumption.

Lastly, the goal is not only to use less energy, but also to recover excess energy, which is typically obtained in the form of heat. The component best suited to this end is the heat exchanger, which – when skillfully applied – will yield amazing results in terms of energy recovery.

**The art of the engineer**

However, the best components will be useless if wrongly applied. From his experience, Fritz Langenegger knows that the “art of the engineer” is the prerequisite for creating an optimal machine. “The interaction between the individual components must be right,” says Langenegger, explaining the basic precondition for producing high quality in an individual machine. “A machine will only work optimally and with high energy efficiency if all the components needed for the production process are linked up in the best possible quality and in the correct configuration.”

And what applies to the individual machine is ultimately all the more true for the entire plant. The art of the plant engineer is to wed the individual machines of optimal size so that they form a whole. Langenegger: “This, too, is an area where energy can still be conserved. For example, vertical conveying lines consume more energy in fulfilling their function than horizontal ones do.” The energy-conscious plant engineer will therefore in the customer’s interest also pay attention to such details. (bos)

**Example No. 2: Energy consulting**

The assignment that Duncan Lawson, Group Engineering Manager of the U.K. Allied Mills company, gave to the Customer Service organization of the BuHer Grain Processing division was clear: Increase the energy efficiency of the pneumatic suction conveying system in the flour mills of Allied Mills. In an initial step, two BuHer experts took the necessary measurements in two different grain milling facilities of Allied Mills in order to determine their current condition. A few weeks later, the Customer Service specialists’ proposals were available: They advised the customer to improve the routing of the conveying lines and to install frequency converters. Wherever possible, the line routing was to use straight and direct pipes with as few elbows as possible and utilize the force of gravity. Frequency converters were to be installed in order to supply power to the high-pressure fans as needed without changing the pressure in the lines. Allied Mills was convinced of the effectiveness of the suggestions put forward and in a first stage entrusted BuHer with revising the pneumatic suction conveying system of their flour mill in Tilbury, England. The rebuild progressed as scheduled, and it did not take long before the first results were available: A reduction of 12.7% of power consumed on the pneumatic fans and 1.4% reduction in total site power annually. This is equivalent to the power that 45 average households consume every year. Duncan Lawson is entirely satisfied with the outcome: “The individual consulting services and the extremely targeted implementation of the different energy saving measures in our plant in Tilbury have convinced us. Among other things, we are currently reviewing a similar project for our plant in Manchester, as we were highly satisfied with the consulting services supplied by BuHer there, too. Our goal beside cutting energy consumption is to maximise our plant’s performance in cooperation with BuHer.”

(bos)

For more information on Energy Consulting, please contact: Christian Hilber, Product Manager Division Grain Processing at BuHer in Uzwil, T +41 71 965 71 66, christian.hilber@buhlergroup.com

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**WinCoS Energy system**

Buhler has a software package which traces the energy usage of individual plant sections or processing lines and thus allows efficient energy management.

**Energy recovery**

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Low operating costs – top flour quality

Business at the Siemer Milling Company enjoys brisk growth. This means that Siemer has been able to continuously add to its milling capacities in the past. Buhler has accompanied the growth of Siemer for almost 50 years. The latest step in this development is a new flour mill built in Hopkinsville with a capacity of 250 metric tons per 24 hours.

The Siemer Milling Company is a mid-size flour milling company based in the United States of America. Set up by the Uptomor and Siemer families in Teutopolis, Illinois, in 1882 under the name “Hope Mills,” the company has been owned by the Siemer family since 1906 under the name of Siemer Milling Company. The employees of the Siemer Milling Company have held a substantial stake in the business since 2000.

Two large flour mills

After Siemer had been active in numerous agricultural fields in the first half of the 20th century, it started focusing on the flour milling business at the end of the fifties. Today, the Siemer Milling Company operates two large mills with a total of 135 employees and annual sales exceeding 100 million US dollars. The company operates two mills at two sites – one in Teutopolis, Illinois, where the company is headquartered, another in Hopkinsville in southern Kentucky. Together, they process some 300,000 metric tons of locally grown wheat a year into flour, bran, and wheat germ. One of the specialties of Siemer are heat-treated flours or flours used as binders in industrial production applications.

North America’s most advanced mill

The Siemer Milling Company has been a Buhler customer for almost 50 years now. When the new mill in Hopkinsville was being planned a little less than 20 years ago, Buhler was entrusted with designing and building the facility with a capacity of 350 metric tons per 24 hours (t/24 h). It was to be based on a state-of-the-art, space saving process flow chart and to be equipped with the latest Buhler machinery and system components. When it officially opened in 1995, the Siemer A Mill in Hopkinsville was acknowledged to be the most advanced flour mill in North America. As a result, the Siemer mill served as a welcome showcase installation for Buhler.

A short time later, in 1998, a B Mill was added to the facility in Hopkinsville, with a processing capacity of 120 t/24h. At the same time, the capacity of the A Mill was increased to 400 t/24 h.

Yet another 300 t/24 h

“Continuous growth prompted us to add another 300 metric tons a day to our milling capacities in Hopkinsville,” explains Vernon “Red” Tegeler, Vice President of the Siemer Milling Company. “As a result of our customers’ growth and the new customers we have won, we are continuing our growth and processing more wheat every year.” Beside adding to its capacities, Siemer is also pursuing some other goals with the new mill. “We wanted an essentially automated mill that would be easy to operate, energy-efficient, and capable of meeting the most rigorous standards in terms of food safety,” says Vernon “Red” Tegeler, summarizing the additional objectives. “And lastly, our intention was to apply the latest, yet tried and true process technology. In order to achieve these goals, we entrusted Buhler with supplying us with a new mill boasting the newest machines and systems.”

Richard Siemer, President of Siemer Milling, adds another goal: “In addition to all these commercial targets, we also wanted to create a showcase facility with our new mill. Anyone familiar with the grain milling business must be overwhelmed when they enter our new plant – by its technology as well as efficiency.”

Without interruption

The order for the new C Mill of the Siemer Milling Company in Hopkinsville finally comprised a modern and highly effective cleaning stage, the actual grinding system, the rebolting section, and the transfer of the finished products to the bulk storage or loadout bins plus the rail and road loadout systems. All the installations have been designed with top sanitation standards in mind. The complete new mill is controlled by the Buhler WinCoS.r2 process control system. This allows the new plant to be operated by the existing workforce. One important condition was that the A and B Mills were to continue operation without interruption during the installation phase.

To accommodate its new C Mill, Siemer entrusted a local company to build a new six-floor building with a footprint of 20 by 25 meters and a height of 30 meters. Construction work started in February 2009. By the autumn, Buhler had started installing the systems, and the new mill went into operation as early as March 2010. The facility was officially opened on June 17, 2010.

Modern cleaning system

The cleaning system of the new Siemer mill has been especially designed to satisfy the local conditions. In a first stage, the wheat is freed...
from the common impurities by means of traditional cleaning equipment. In a second stage, it passes through two optical sorters of Buhler SORTEX. In the two high-capacity sorters used, the wheat is checked for the presence of organic contamination. The main goal here is to remove wheat grains infested by fungi and thus to prevent toxic contamination of the finished products. "Before installing the optical sorters, we subjected them to exhaustive tests in our mill in Teutopolis," explains Vernon "Red" Tegeler. "The test results were very encouraging so that we agreed to install the machines in our new cleaning stage in order to improve its effectiveness." And, as Tegeler was satisfied to find after the first months of operation, "the two Sortex Z3 and Z1 sorters are doing an outstanding job."

**Thirteen Antares roller mills**

Once it has passed through the Sortex sorters, the wheat undergoes a moisture check and a dampening stage and is then transferred to three tempering bins, where the WinCoS.r2 process control system ensures an optimal retention time. Before the wheat finally reaches the roller mills, it once again passes through a magnetic separator, a scourer, and an aspirator.

The heart of the new C Mill of the Siemer Milling Company is the roller floor with a total of 13 newest-generation Antares roller mills. Of these, eleven are four-roller mills and two eight-roller mills. Also the Antares roller mills have more than fulfilled Siemer’s expectations. "The roller mills operate remarkably well," says Tegeler. "Unlike other roller mills, they run very quietly. What is more, their design ensures unrivalled food safety."

Upon completion of the grinding process, the flour are rebolted by two Sirius sifters equipped with NovaPur sieves. The finished flours are then transferred to the large bulk storage bins or the holding bins prior to loadout.

**Control and monitoring**

The new C Mill of the Siemer Milling Company is controlled by a Buhler WinCoS.r2 process control system. WinCoS.r2 is characterized by its high product safety and data security and is distinguished by its high operating convenience.

The automation solution selected for controlling the new Siemer flour mill has an online quality system whose integrated NIR DA technology monitors the predefined minerals content and if necessary corrects it fully automatically. This ensures that the flours produced will meet the quality requirements in the best possible way. For monitoring the energy costs of the new facility and for reducing the energy input, the power consumption of all the motors is logged as a graphic trend curve and saved so as to be available for retracing.

**Goals achieved**

"In building the new C Mill, we had two goals in mind," explains Vice President Tegeler. "On the one hand, we wanted to boost our daily processing capacity while minimizing the additional increase in energy consumption and our number of employees. At the same time, we wanted to strengthen our market position as a reliable supplier of high-quality flours. In order to achieve these targets, we relied on Buhler as an engineering partner. We have not been disappointed. Our new mill is running to our full satisfaction. We are achieving a higher capacity without having to employ additional people. We are producing our flours at an unparalleled sanitation level and supplying our customers with products of top quality. Together with Buhler, we have reached our ambitious goals."

Also Buhler achieved what it had set out to do: To satisfy the customer’s high expectations and – 15 years after building Siemer’s A Mill – to once again set up a welcome showcase installation for the North American market with the C Mill.

bos
A giant in a compact form

With its Carat 400 Compact, the German company Albert Handtmann Metallgusswerk GmbH & Co. KG is entering the market for large and complex die cast components. The new Carat has been producing parts since the spring of 2010 in the company’s factory in Biberach. The track record so far is excellent.

Albert Handtmann Metallgusswerk GmbH & Co. KG is one of Germany’s largest aluminum foundries. At its three production sites in Biberach and Annaberg-Buchholz in Germany and in Kosice in Slovakia, Handtmann generates annual sales revenue of 210 million euros with some 1250 employees. Every year, castings with a total weight of 30,000 metric tons are manufactured. The sole metals processed are the light aluminum and magnesium alloys.

Cutting-edge processes
Handtmann covers the entire range of modern light-alloy casting processes. This enables the most suitable production technology to be chosen for every specific application. With its process engineering innovations, Handtmann continuously sets new standards in the industry. High-tech volume casting using cutting-edge equipment and automated production processes in die casting, permanent mold (gravity die) casting, and the lost-foam process represent the state of the art.

In addition to casting, the company also offers machining for finishing the cast components as well as partial or complete assembly of systems and units. For this purpose, it uses 25 high-speed CNC installations, over 40 CNC machining centers, and various special-purpose machines.

New market
On its total of more than 60 cold-chamber die casting machines installed in its three factories in Biberach, Annaberg, and Kosice, large volumes of die cast components of aluminum and magnesium are manufactured. Until recently, the largest system had a locking force of 2,500 metric tons. Since this year, Handtmann has been operating a new cold-chamber die casting cell with a locking force of 4,000 metric tons – a Buhler Carat 400 Compact based on two-platen technology and using a real-time-controlled shot unit. This purchase is the company’s response to the trend of making larger cast parts that satisfy the most rigorous requirements. “We have thus closed a gap and have entered the market for large and complex components in a targeted manner,” explains Jürgen Licht, general manager of the Handtmann Light-alloy Casting unit. Handtmann has thus also made a step into a new dimension. But the manufacture of parts with shot weights up to 50 kilograms not merely requires larger machines, but also adjustments in various areas. “Technology, production, die-making, and die maintenance had to be adapted to the new conditions – a real challenge,” explains Jürgen Licht.

Total cost of ownership is what counts
Handtmann has been relying on Buhler solutions since the eighties. “Buhler has always been a good and reliable partner for us up to now,” is the opinion that you will hear at Handtmann. “But that was not the crucial point when we decided to buy the new system.” The decision was swayed in favor of Buhler, says Licht, when they considered the total cost of ownership. “Not only the purchase price counts, but also the uptime and productivity of the system and the quality of the components manufactured. Such an installation must run with top performance.”
reliability. The supplier must provide immediate support whenever required and be ready to assist us with services and spare parts. This supply reliability is very important to us, and we believe that Buhler can guarantee it as our partner,” says Jürgen Licht praisingly.

But for Handtmann, the “total cost of ownership” also includes the satisfaction of the employees who operate the system day in, day out. He says that casters all have their personal preferences and must be able to handle a production system. It is therefore important to Handtmann that they back the purchase decision. Another important factor was the reduced space requirement. This always comes in as an argument when a new system has to be fit into an existing infrastructure. The new Carat in the factory in Biberach is installed next to six systems of conventional design with locking forces ranging from 1,600 to 2,500 metric tons. Jürgen Licht: “And the Carat hardly occupies more space than the smaller casting cells, despite its complete range of peripherals such as ladling furnace, die spray robot, extraction robot, marking unit, cutting unit, component cooling system, trimming press, and machining station.”

Smooth project implementation
The new Carat die casting cell went into productive service in the spring of 2010. Close cooperation with the Handtmann technicians enabled smooth installation and start-up of the complex system. Jürgen Licht: “Buhler always did a fine job with all the systems supplied up to now. Things were exactly the same this time around. Installation and start-up took little time and were completed on schedule. The system worked properly right from the start.” And Max Beck, in his capacity as the Handtmann Die Casting Technology department manager who accompanied project implementation step by step, adds: “We are really proud of the job that we – Handtmann and Buhler – have accomplished.”

Extremely satisfied with performance
Since then, the new Carat has been fully integrated in production. The system is operated in three work shifts. The two-platen die closing system has proved to be very rugged, and the production process is extremely stable. Jürgen Licht: “The system is really impressive and is running to our full satisfaction.” Max Beck and Kay Peters, who as Die Casting department managers at Handtmann work closest with the new Carat, add laughingly: “The system is running so reliably that we can enjoy our weekends without a second thought.”

The Handtmann Group
Albert Handtmann Metallgußwerk GmbH & Co. KG is part of Albert Handtmann Holding GmbH & Co. KG. Today’s group is made up of six independent business units: Light-alloy Casting, Filling and Portioning Systems, System Engineering, Machining Centers, Plastics Technology, and Systems Technology. The group has some 2500 employees and generates annual sales of almost 500 million euros. Since it was set up in 1873 by Christoph Albert Handtmann, the company has been owned by the Biberach entrepreneur family Handtmann. As a third-generation member, Arthur Handtmann heads the group as chairman of the advisory council. Thomas Handtmann (fourth generation) has headed the group’s operating activities since 1998.

“Everything went just fine. It took the Carat a very short time to achieve full capacity!”

Jürgen Licht
General manager of the Light-alloy Casting unit
Albert Handtmann Metallgußwerk GmbH & Co. KG
Trias™ – next-generation three-roll technology

State-of-the-art three-roll technologies are promising approaches for solving a broad range of process engineering tasks. Originally developed for the efficient manufacture of printing inks, entirely new fields of application in the digital and solar industries as well as in the high-tech industry have gradually emerged over the years in collaboration with customers. The experiences gained have been incorporated in the development of a new generation of three-roll mills based on an innovative machine design. The outcome of these efforts is the Trias™ machine series.

Good technology can be further improved, a fact borne out by the new generation of three-roll mills that were launched in 2009 under the trade name Trias™. The Trias™ 300 series has been designed for processing batch sizes ranging from less than one liter up to 75 liters per hour. The machine series next in size is the Trias™ 600, which achieves hourly throughput rates between two and 150 liters. The Trias™ 800 rolled out at this year’s ChinaCoat 2010 trade show further increases the throughput capacities of the series: Now, throughput rates as high as 300 liters per hour are possible. For the first time, ceramic rolls and the camberless VIVA™ rolls are being offered for this machine size.

Fast roll changes

But not alone the higher throughput capacities are important. Especially the many improvements of important details make the Trias™ an attractive option for manufacturers of printing inks, electronic pastes, or – say – glass or metal pastes and cosmetics. For example, the developers created a new PLC control system which on the basis of a connected data capturing system guarantees the reproducibility of production processes and thus a consistent quality of the batches produced, regardless of the operating personnel. This enables Buhler customers to maintain their product qualities at a consistently high level. Or, if required, they can make faster batch changes because they can use existing product formulas and application parameters. Roll changes take little time: The entire roll pack can be completely lifted out of the machine after undoing just a few elements and be replaced by a new roll pack that has been placed ready. This reduces downtimes to the absolute minimum.

Improved cooling

In addition to the well-known reliability and ruggedness of the machines, the most outstanding benefits offered by the new Trias™ include its high raw material yield and gentle dispersion of temperature-sensitive materials. The proven cooling system has once again been further refined and improved. An enclosed cooling circuit equipped with an internal heat exchanger ensures optimal cooling even at high rpm. This allows the manufacture of temperature-sensitive products in large batches. The camberless VIVA™ roll technology provides a uniform product quality across the entire roll length, regardless of the roll pressure applied. This enables the full roll pressure range to be covered.

In the manufacture of printing inks, the product’s gloss is the crucial quality criterion in the marketplace. This is a field in which the Buhler three-roll technology is distinctly superior to other process technologies. The typical, very narrow particle size distribution and the high shear velocity inside the roll gap allow product characteristics to be achieved which are hard to...

Contamination-free production

Trias™ three-roll mills do not need any hydraulic elements. Instead, mechatronic elements are used for controlling the roll pressure, which do not require any oil. This is especially important in clean-room applications, since this design completely rules out any contamination by hydraulic fluid. Cleanroom requirements for the three-roll mills can be met on the basis of various options, for example special drives or encapsulation.

For more information on the Trias™ three-roll mill, please contact:
Cornel Mendler
Head of Product Management
Grinding and Dispersion Business Unit
at Buhler in Uzwil
T +41 71 955 13 43
F +41 71 955 31 49
cornel.mendler@buhlergroup.com

Trias™ – the new Buhler three-roll mill.
Higher productivity – higher occupational safety

Buhler regularly involves customers in its development efforts at an early stage. Thus, a Trias™ of the pre-production run was installed and tested in day-to-day productive operation at Marabu GmbH & Co. KG in Tamm, Germany.

Uwe Wiesebrock, production manager of Marabu GmbH & Co. KG, describes the experiences gained with the new Trias™: “Marabu uses this new three-roll mill to manufacture solvent-based and UV-drying screen and pad printing inks as well as digital printing inks. The great benefit of the new three-roll mill is its programmable logic control (PLC) system. It makes it very convenient and much easier and safer to operate the machine. Our expectations that the reproducibility of the results would increase in practice thanks to easy parameter input and elimination of manual selection of settings were essentially fulfilled. The control system has enhanced the machine’s operating reliability. Employees’ workload in monitoring the machine has been reduced. This markedly increases productivity. In our eyes, another advantage of this three-roll mill is its enclosed cooling and heating circuit and the continuous selection of the roll speed. This gives us more possibilities to find the optimal parameters for each product formulation and then to grind it with the highest efficiency possible. The continuous speed settings allow higher throughput rates to be achieved than with a machine of the same size with constant speeds. Thanks to its safety features, the Trias™ offers a higher level of occupational safety than that of older three-roll mills and operates with much less noise.”

New control system for higher flexibility

The new PREMIUM control system pack is equipped with a cutting-edge programmable logic control (PLC) system and a fully graphic-enabled touch-screen panel. The clear user interface allows process visualizations and direct entry of operating parameters such as roll temperature, roll gap, roll speed, and roll pressure. The optional product film thickness measurement system on the third roll enables complete control of the product quality. The roll gap and roll pressure are electronically regulated and allow accurate production control and thus reproducible processes.

The newly designed roll chamber of the Trias™ makes it easier to clean the machine and thus reduces downtimes. The L-shaped roll configuration speeds up cleaning because access to the surfaces to be cleaned is easy. Losses in the event of operating trouble or product changes are minimal. A special concept for feeding the material to the three-roll mill using a press-out device and pump increases operating safety and reliability. New protective screens and cages are particularly suited to manual material feed. All current personnel safety regulations are satisfied thanks to the various safety guards installed on the machine. At present, Trias™ three-roll mills are available for customer tests both in Uzwil and in Buhler’s test laboratory in Japan.

Technology and food safety experts of leading food companies in North America came together for the first time upon an initiative of Buhler to map food safety challenges and priorities, create commitment, and set up a roadmap on how to move forward.

Invited by Buhler, more than 30 managers from leading U.S. food companies traveled to Bloomington, Minnesota, to discuss food safety. “We sensed the need in the industry for such a platform for the exchange of knowledge and ideas on safe food engineering. But we were overwhelmed by our customers’ interest,” says René Steiner, President of Buhler North America, who launched the initiative. “Under the guidance of Professor Will Hueston, Executive Director GIF- SL, we exchanged know-how, raised commitment to intensify our collaboration, and established three roadmaps and teams behind them for implementation. We also did some extraordinary interdisciplinary networking between technology and microbiology people.” The second SFERT (Safe Food Engineering Round Table) event has already taken place – another sure sign of the commitment and sense of urgency triggered by the first event. The Food Safety Round Table is part of the Food Safety Initiative that Buhler launched in the summer of 2010. The intention behind the initiative is to better understand the challenges and requirements of food safety aspects in the markets. Buhler plans to spearhead the effort to deliver optimal solutions in order to support customers in meeting the challenges they face. “We need to act rapidly and in a solution-oriented way to these new trends. We plan to do this particularly in line with the Buhler strategy of innovatively expanding the service business,” explains Stefan Scheiber, Head of the Food Processing division. “Buhler has a long tradition of commitment to food safety. But the interest expressed by our customers encourages us to step up these efforts to serve our customers with innovations for better food safety. The pioneering role of our North American operations will serve as the cornerstone in our strategy development for the rest of the world.”

Sitting at the round table for the first time

Professor Will Hueston moderated the first Food Safety Round Table in Bloomington.
Suryo Pranoto trades in Indonesian green coffee. His customers around the globe attach great importance to top coffee quality. He entrusts the cleaning and sorting of the raw coffee to the cutting-edge processing systems of Buhler.

Suryo Pranoto, an Indonesian citizen, is a modest person. He does not make a fuss either of himself or of his business, although he is one of Indonesia’s major – or arguably even the largest – green coffee exporter. He also trades in spices and with his “Opal” operates his own coffee shop chain in Indonesia that is modeled after international coffee chains.

Suryo Pranoto shows extreme Asian reserve when it comes to disclosing his business figures. He keeps both the consolidated sales of his companies and the identity of his global clientele to himself. Asked about the number of people he employs, he modestly says “a few hundred”. But one hint of how his business is running is the name of his company: PT Sarimakmur Tunggalmandiri. Sarimakmur stands for “sustained prosperity” and Tunggalmandiri is the symbolic expression for “independent”.

Top-quality coffee
Suryo Pranoto purchases its green coffee from all parts of Indonesia. Before he supplies it to his customers, the raw coffee is cleaned and sorted in his factory in Surabaya, a city with a population of over two million in the eastern part of Indonesia’s main island. And because Pranoto believes that “top-quality coffee should only be cleaned and graded on top-quality equipment,” he ordered a complete cleaning and sorting installation for green coffee a year and a half ago from Buhler.

Generating added value with Buhler
This new processing installation in the factory PT Sarimakmur Tunggalmandiri is equipped with cutting-edge machinery. It consists of three parallel lines with a processing capacity of 2.5 metric tons per hour each. Following gentle yet thorough cleaning, the green coffee beans pass through an optical color sorter of type Sortex Z+ supplied by Buhler Sortex. This system removes the defective coffee beans along with impurities from the accept product with an accuracy exceeding 99.8 percent.

The new cleaning and sorting system operated by PT Sarimakmur Tunggalmandiri has been in continuous service for almost a year now. It is running to Suryo Pranoto’s full satisfaction: “The quality of our green coffee has been given a further boost by using the new cleaning and sorting stage of Buhler. This allows us to offer our customers our coffee at a higher quality level than ever before.”

For more information on the Sarimakmur project, please contact:
Hans-Ueli Landis
Area Sales Manager
Chocolate & Coffee Business Unit
at Buhler in Melbourne, Australia
T +61 3 9872 7904
M +61 4 0957 3958
hans-ueli.landis@buhlergroup.com

The entrance to the factory of PT Sarimakmur Tunggalmandiri in Surabaya, Indonesia.
Extrusion and pelleting

HQ Sustainable Maritime Industries Inc. (HQS) is one of the world’s leading companies in the field of integrated, natural fish breeding and the production of light and wholesome fish foods. HQS focuses on the tilapia, a high-protein, easy-to-breed fish from the family of the chichlids. The headquarters of this listed stock corporation is located in the United States. Most of its production facilities are based on Hainan, an island of the People’s Republic of China in the South Chinese Sea.

Sustainability

HQS has committed itself to the strict use of natural methods in order to offer its customers the purest products possible. The production facilities of HQS operate on the basis of HACCP and ISO standards and are certified accordingly by the U.S. Food and Drug Administration FDA and the European Union. This allows HQS to sell its products in the international markets. The high quality of the products that HQS makes is acknowledged worldwide. For example, the ACC (Aquaculture Certification Council) gave HQS top marks for the processing of tilapia. And the Chinese government awarded HQS the organic products label for the production of tilapia, its processing, labeling, and marketing as well as management.

Fish farming on Hainan

On Hainan, HQS operates a large fish farm near Wenchang. Here, ideal conditions exist for breeding tilapia. This chichlid species requires water temperatures of at least 18 to 20 degrees Celsius for its rapid and healthy growth. The tourism island of Hainan offers ideal conditions for breeding tilapia with its balanced climate. Because HQS also wished to create ideal conditions for feeding these fish, it entrusted Buhler with building its own feed manufacturing plant in Wenchang. During the official opening of the new fish feed factory in August 2009, HQS President and CEO Norbert Sporns said that “this start-up marks an important step toward improving the quality of our fish products”. The new feed production facility, continued Sporns, allows the production of fish feed without requiring the use of fish meal or fish oil, which allows contamination of the oceans to be further reduced. In addition, he says that the new plant allows algae meal to be added and thus the proportion of wholesome omega-3 fatty acids to be greatly increased in the table-grade fish.

Extruder and pellet mill

The new fish feed factory operated by HQS was designed and constructed in close cooperation between the two Buhler sites in Changzhou (China) and Uzwil (Switzerland). The distinctive feature of the new HQS fish feed facility is its dual-line design for producing pellets as well as extruded products. For making the extruded products, the revised single-screw extruder type AHSH is now being used for the first time ever. The application of an extruder (production capacity 3.5 metric tons per hour) allows the manufacture of floating products with a particle size ranging from two to five millimeters. These do not dissolve as quickly in water as products made on a pellet mill. The advantage of the floating fish feed is that breeders have tight control over the quantity of feed consumed by the fish. Beside the single-screw extruder, the new fish feed factory of HQS is also equipped with a pellet mill for producing fish feed pellets with a size of two to five millimeters and at a rate of 8 to 12 metric tons per hour.

The new fish feed production facility of HQS does not limit its production to covering its own needs. The pellets and extruded products are also supplied to other fish farms in Asia. And thanks to its dual-line strategy, HQS can now service both markets – that for traditional fish feed as well as that for floating products.

Two-stage grinding process

The pellet mill and the single-screw extruder constitute the heart of the new aqua feed factory of HQS. But before pellets and extruded products can be made, the raw materials (different extraction meals, rice bran, and other ingredients) have to be ground to a particular particle size. The grinding process consists of two stages. A hammer mill is used to make the first stage. The ground meal is then sieved to remove any oversize particles. The material passing through the sieve then goes to a second stage of grinding, in which a single-screw extruder is used.

For more information on the HQ Wenchang project, please contact:

Urs Wuest
Head of Engineering & Fulfillment
Feed & Biomass Business Unit
at Buhler in Uzwil
T +41 71 955 31 39
F +41 71 955 28 96
urs.wuest@buhlergroup.com

The single-screw extruder operated by HQS in Wenchang.

The new production facility of HQ Sustainable Maritime Industries in Wenchang on the Chinese island of Hainan.
wheat flour, wheat bran, soy oil must be received, precleaned, and ground. Grinding is accomplished in two stages. A conventional hammer mill first pre-reduces the raw materials. Fine grinding, which is very important in the production of optimal fish feed, is carried out in a specially designed pulverizer, which is built in the Buhler factory in Changzhou. Before the fine-ground ingredients are fed to the pellet mill or the extruder, the fish feed is accurately blended and mixed exactly according to the product formula. In this step, also vitamins and premixes are added.

The new feed manufacturing plant of HQS, which was completely designed and constructed by Buhler, also includes installations for finishing and packing the pellets and extruded products. The entire plant is fully automated and controlled from a centralized location using the Buhler WinCoS automation software.

Smooth operation
The new aqua feed factory operated by HQS Wenchang needs a machine which greatly adds to the operation of optimal fish feed, is carried out in a specially designed pulverizer, which is built in the Buhler factory in Changzhou. Before the fine-ground ingredients are fed to the pellet mill or the extruder, the fish feed is accurately blended and mixed exactly according to the product formula. In this step, also vitamins and premixes are added.

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Change in the Buhler board of directors
A change has taken place in the board of directors of Buhler. Dr. Hans-Ulrich Doerig will leave the board because he has reached the age limit. Dr. Hans-Ulrich Doerig has been a member of the board since 2004. He will be succeeded by Dr. Konrad Hummler, managing partner of the private bank Wegelin & Co. Privatebankers. Dr. Konrad Hummler studied law at the University of Zurich and business administration at the U.S. University of Rochester. In 1989, Dr. Hummler joined Wegelin & Co. Privatebankers in St. Gallen, where he has been a partner with unlimited liability since 1991. In addition to his banking activities, Dr. Hummler is also a member of the board of various other companies, including the Swiss daily Neue Zürcher Zeitung (NZZ) and the German Stock Exchange (Deutsche Börse).

Buhler distinguished by Japanese magazine
In mid-September, the Buhler Technology Group was distinguished by the Japanese food trade journal “Nihon Shokuryo Shinbun” with the “Excellent food machinery award” for its outstanding processes, plant, and equipment. The journal is the acknowledged organ of the Japanese food industry and is read by the management staff of this industry – covering businesses ranging from flour mills and bakeries to breweries and confectionary companies. The highly prestigious “Excellent food machinery award” has been presented for 13 years now. Max Klinger (left), head of Buhler Yoko-hama in Japan, accepted the award on behalf of Buhler. (vog)

Large-scale contract received from Saudi Arabia
Buhler has been awarded a large-scale contract from Saudi Arabia worth 110 million Swiss francs. The order is related to Saudi Arabia’s plans to privatize the grain milling industry, which up to now has been government-controlled. The operator of the plants, the governmental Grain Silo and Flour Organization (GSFMO), thereby intends to meet the rapidly increasing requirements of the grain flour market. The order comprises two sub-projects. In Mecca, Buhler has been entrusted with supplying a new plant worth 90 million francs with a processing capacity of 1200 metric tons a day. In the city of Jeddah, a plant will be updated for 20 million francs which is capable of processing 450 metric tons a day. (ca)

Innovation award for Buhler Barth and Log5
Buhler Barth and the U.S. Log5 Corporation have won the renowned IFT (Institute of Food Technologists) Food Expo Innovation Award 2010 for the pasteurizing and sterilizing process with controlled condensation (CCP). The CCP technology is entirely natural, does not use any chemicals, and is capable of pasteurizing all varieties of nuts and peanuts (also in their shells) while retaining their original taste, texture, and appearance. The IFT plans to advance food science and to ensure long-term safe and abundant food supplies for healthier people. At the IFT Food Expo, exceptional product, equipment, instrumentation, process technology, and service innovations are distinguished. (f)
AeroExpander™ for healthier snack foods

Buhler Aeroglide has developed a new oven for baking snack foods. Continuous hot-air expansion inside the AeroExpander™ produces wonderfully puffed and healthier snack foods.

The snack food industry is continuously rolling out new products. The trend is toward baked snack foods that are not deep-fried. In response to this increasing shift in the snack food industry toward healthier, baked products, Buhler Aeroglide has developed the AeroExpander™.

Consistent expansion

Designed for continuous hot-air expansion of snack pellets, the AeroExpander™ supplies a uniform hot-air stream that ensures efficient and consistent expansion. The proven, customized dual plenum technology of Aeroglide – paired with a special air supply system and a unique materials conveying device – allows hundred percent expansion of the pellets. The result: An outstanding product uniformity with highly accurate control over the degree of expansion, bulk density, color, and texture of the product.

The requirements of the snack foods industry

The AeroExpander™ has been purpose-designed for satisfying the stringent requirements of the snack foods industry:

- Uniform products with one hundred percent expansion
- Flawless uniformity of different pellets
- Possibility of accurate control over retention time, air temperature, air velocity, bulk density, color, and texture

- “First-in-first-out” product tracking
- Process flexibility for accurate retention time control – from seconds to several minutes

Different machine sizes

The AeroExpander™ comes in different sizes – with throughput capacities as high as 1,200 kg/h. By offering these different machine sizes, Buhler Aeroglide can satisfy the requirements of snack producers of any scale – from small businesses to multinational corporations. In addition to production machines, laboratory versions of the AeroExpander™ are also available for supporting research and development efforts aimed at producing new, promising, and healthier snack foods.

Excellent grades

With its focus on sanitation, food safety, and health, the AeroExpander™ is based on a food-compatible, highly rugged design offering great ease of access for cleaning. Recycling of the air enables healthy snack foods to be made while ensuring high energy efficiency. In recent tests, the head of the research and development department of a major international snack food producer awarded the AeroExpander™ “10 out of 10 points” for product quality and consistency.

For more information on the AeroExpander™, please contact:

Shelly Rider
Marketing Manager
Buhler Aeroglide Business Unit
at Buhler in Raleigh, U.S.A.
T: +1 919 278 2864
F: +1 919 851 6029
sryder@aeroglide.com

Snack foods before and after baking in the new AeroExpander™.
Generating added value through new solutions

Modern-day flour mills are increasingly faced with specific customer needs and wishes. This calls for an adjustment to the value chain. Buhler possesses the fundamental knowledge, the process know-how, and the plant and equipment to generate the required added value. When grain millers and Buhler combine their capabilities, every one stands to win.

Sustainable globalization does not stop when it comes to the grain milling industry. Changes in international regulations have eliminated centuries-old borders and unlocked new markets. Rapid technical progress is leading to a worldwide improvement of flour quality and is intensifying competition. The science of business administration mentions two possible ways to improve earnings in such a situation – an increase in the volumes sold or the search for niches.

Innovative flour millers

However, it is only possible to improve profitability on the basis of higher tonnages in growth markets. In saturated markets, differentiation by offering products with higher added value is much more promising. “Modern-day grain millers know their sales markets very well,” says Christopher Rubin, Head of Product Management and Marketing in the Pasta & Extruded Products business unit. “They are in permanent contact with their customers and are thoroughly familiar with their wishes and needs.”

Fundamental knowledge

Knowing the market requirements is one thing, satisfying them another. In the course of its 150-year company history, Buhler has acquired an enormous wealth of specific knowledge. “We have very accurate knowledge of grain’s properties,” explains Madlen Hasler, Technologist Value Adding Processes in the Grain Milling business unit. “And we have also conducted in-depth research in our laboratories into the characteristics of the products emerging from the grinding process such as flour, semolina, and bran. We therefore know how they will behave when they undergo mechanical or thermal treatment.”

Processes and production plants

However, Buhler does not only have the necessary basic knowledge, but also the process and equipment expertise to put this fundamental knowledge to practice. “We know how products behave, and we know how to achieve the desired results,” says Madlen Hasler. “We have the suitable process technologies and the production equipment and systems required to achieve the desired product properties. We continuously search for new processes and applications in our test facilities.”

But how can Buhler keep its promise to help grain millers achieve the added value that they are aiming at? Christopher Rubin: “We show millers how to impart new properties to the flours and byproducts they produce by applying suitable processes and production plants with new characteristics.” They modify the physical, chemical, or nutritional properties of the ground products, for example starch gelatinization of flour or stabilization of the bran. The use of such processes may reduce microbiological contamination; change the taste and color; modify the texture, density, and toughness; or improve the water absorption capacity of the products. Madlen Hasler: “For instance, we can increase the water absorption capacity of flour by adding gelatinized starch. This will increase the dough yield, and the loaf of bread will retain its freshness for a longer time.”

New approaches

The new approaches to generating product-specific added value which the specialists at Buhler can offer their customers lead to “new” milling end products suitable for making foods, animal feeds, and even nonfood products. Christopher Rubin: “When we explain our customers the wide range of possibilities that exist, their knowledge of their markets will enable them to find potential consumers. And when we then combine our product development capabilities with their market and milling savvy, this will give rise to ever-new applications and products.”

For more information on “Added Value”, please contact:

Christopher Rubin
Head of Product Management and Marketing Pasta and Extruded Business Unit
at Buhler in Uzwil
T +41 71 955 13 17
F +41 71 955 33 88
christopher.rubin@buhlergroup.com

Madlen Hasler
Technologist
Grain Milling Business Unit
at Buhler in Uzwil
T +41 71 955 26 48
F +41 71 955 38 60
madlen.hasler@buhlergroup.com

Untreated wheat flour (left) and wheat swelling flour (right) viewed under the scanning electron microscope. The arrows indicate starch granules that are untreated (left) and gelatinized (right).
A partnership that has lasted over 30 years unites the Spanish flour market leader Harinera Vilafranquina S.A. and the international Buhler Technology Group. The latest example of this close cooperation is the new flour mill (750 t / 24 h) that Buhler built for Vilafranquina in Santa Margarida i Els Monjos near Barcelona.

Today, Harinera Vilafranquina S.A. is Spain’s largest flour producer and one of Europe’s major grain milling groups. The Vilafranquina Group specializes in the production of a wide range of flours and semolinas as well as the wheat feed. In addition the group processes the semolina produced in its own mills into top-quality pasta.

Fast growth
Harinera Vilafranquina S.A. was founded in 1969. Beside its rapid organic growth over the past 20 years, the Vilafranquina Group also owes its current significance to the acquisition of various companies: Pastas Gloria (today Oromas S.A.), Harinera del Pisuerga S.A. and Guría S.A. The headquarters of the group are in Vilafranca del Penedes near Barcelona. In its pasta factory Oromas in Zaragoza and its four mills in Santa Margarida i Els Monjos (Barcelona), Arévalo (Ávila) and Càdiz and also in Bellpuig (Lérida), Biurrun-Campanas (Navarra) and Nogales de Pisuerga (Palencia) the group employs a total of more than 450 persons. The group’s total annual sales amount to over 400 million euros.

1 million tons of end products every year
Of the total of six grain mills of the Vilafranquina Group, the facilities in Càdiz with a capacity of 2,200 t / 24 h, Arévalo with 1,830 t / 24 h, and Santa Margarida i Els Monjos with 1,000 t / 24 h are the largest. In all, the Vilafranquina Group’s six mills achieve a total daily processing capacity of 6,000 metric tons. Vilafranquina’s output thus amounts to about 1.5 million metric tons of flour, semolina, and other end products every year. The group holds a share of about 30 percent of the Spanish flour market. But Vilafranquina does not only produce goods for the domestic market alone. Some 200,000 metric tons of wheat and 120,000 tons of end products are exported every year to the European neighboring countries, Africa and the Middle East. In its pasta factory in Zaragoza, the Vilafranquina affiliate Oromas S.A. produces a total of more than 10,000 metric tons of pasta on one short-goods and two long-goods lines supplied by Buhler.

High storage and handling capacities
Fully in line with its high production capacities, Vilafranquina also operates extensive storage facilities for grain and end products as well as a sophisticated logistics organization. Alone for storing the raw materials, the production sites are equipped with bulk storage installations capable of holding a total of 200,000 metric tons of material. Their division into a large number of smaller storage bins allows a large number of different wheat varieties to be stored. And in the finished product warehouses, 45,000 tons of end product await shipping to customers. The products are distributed by a large fleet of the company’s own trucks, which can transport them in bulk and in bags. In addition, special installations are available for loading rail vehicles. In all, the Vilafranquina logistics organization distributes 4,500 tons of products every day to customers throughout Spain.

Partners of more than 30 years
The success story based on the above-average growth of Harinera Vilafranquina S.A. is at the same time Buhler’s own success story. For over 30 years, the Group Vilafranquina and Buhler have been collaborating closely. In their joint striving for quality and customer service, numerous new projects and rebuilds have been implemented during this period. José María Sola Vall, President of the Vilafranquina Group: “Over the past 30 years, a partnership of very high intensity has evolved between Buhler and us, with almost daily contacts. We have executed numerous ambitious projects together. Such close cooperation is only possible with a partner such as Buhler. Beside the quality of their...
plant and equipment and their proven technological expertise, also their local presence is very important.”

New plant in Santa Margarida i Els Monjos
Over the past five years alone, Buhler has designed and constructed four new grain milling facilities for Harinera Vilafranquina S.A., one with a capacity of 420 t/24h (Cádiz), two with capacities of 500 t/24h each (Árvalo und Cádiz), and one with a daily capacity of 750 metric tons (Santa Margarida i Els Monjos). The state-of-the-art mill of Santa Margarida i Els Monjos that went into production this year is the latest example of the fruitful partnership that exists between Buhler and Vilafranquina.

The Santa Margarida i Els Monjos project comprises a state-of-the-art flour mill with a capacity of 750 t/24h. A new building was erected for housing the new mill, with the local conditions allowing only a limited building volume. A customer-specific and space-saving design was therefore all the more important.

Newest plant and equipment
The Vilafranquina Group’s latest flour mill, which went into operation in the spring of 2010, is distinguished by its cutting-edge plant and equipment that was supplied by Buhler. The precleaning section has two lines, one with a capacity of 200 t/24h for soft wheat and one with a capacity of 100 t/24h for durum. The durum precleaning system supplies the semolina mill (210 t/24h) built by Buhler in 1997 with raw material.

The second cleaning stage for soft wheat has a capacity of 48 t/h. Here the latest optical sorters of type Sortex Z+4 supplied by Buhler are used. The heart of Vilafranquina’s new soft wheat mill is the roller floor. It is equipped with a total of eleven eight-roller mills and 13 four-roller mills, neatly arranged in rows.

At the end of the grinding process, the flours are resifted in Sirius plansifters equipped with Nova sieves. The finished flours are then transferred to the large storage bins or the holding bins ahead of the loadout section.

High yield
The new mill of the Vilafranquina Group also includes a special flour blending and mixing section with a capacity of 40 t/h. In addition, a system was installed for the byproducts which allows the production of 14 tons of bran pellets an hour.

The new flour mill located in Santa Margarida i Els Monjos is distinguished by its high yield. Moreover, the utmost attention was paid to operating reliability. The utilization of corrosion-resistant materials, the latest Buhler equipment, and the advanced WinCoS.r2 control system ensures that all the high sanitation and food safety requirements of Vilafranquina’s millers and engineers are fulfilled. Lastly, the application of a special soundproofing system allowed the noise emissions to be greatly reduced for the benefit of the plant employees.

“Buhler is our ideal partner”
The new flour mill operated by the Vilafranquina Group in Santa Margarida i Els Monjos has achieved an outstanding track record since its was commissioned. It is running smoothly and supplies premium-quality flours at the required extraction rate. As during the previous 30 years, the partnership between Vilafranquina and Buhler has once again proven its worth. President José María Solà Vall: “Also the new mill project in Els Monjos showed that Buhler is our ideal partner. Buhler has been instrumental in the growth we have achieved over the past years, with their process technology, the quality of the plant and equipment supplied, their closeness to us as their customers, and the flexibility that they have shown day in, day out.”

José María Solà Vall
President
Harinera Vilafranquina S.A.
Environmentally friendly plastic

The Buhler Thermal Processes business unit has further developed its proven solid-state polymerization technology into a solid-state heat treatment process for the production of high-quality polylactic acid. Polylactic acid is a bio-plastic which can be used as a substitute for plastics based on crude oil.

Polylactic acid (PLA) is an environmentally friendly plastic that is produced from lactic acid based on biomass. The demand for this renewable material has exploded over the past years. This is due to its excellent mechanical properties and durability while still being bio-degradable under industrial composting conditions. Other reasons include a reduced CO₂ footprint, the independence of gradually depleting crude oil resources, and the continuous rise in crude oil prices.

Worldwide, demand for PLA is increasing at an annual rate of over 30%. By the year 2020, demand is expected to exceed one million metric tons annually. Technically, PLA is capable of replacing 6% of conventional plastics from crude oil and 8% of synthetic fibers. On the basis of global consumption in 2007, this translates into a market of 1.6 million metric tons per year.

High-purity PLA
The result of the conversion of biomass into PLA is a granular plastic that can be used for making biologically degradable packaging products, single-use tableware, and synthetic fibers as well as durable goods such as pens, mobile phone casings, or even automobile interior parts. In a manufacturing process recently developed by a well-known Japanese plant supplier, an intermediate product of PLA is transformed by a series of carefully designed process steps into a virtually colorless granular material with excellent structural uniformity.

As a final step of the PLA process, the intermediate product is freed from remaining polymerization residues and transformed into high-purity PLA pellets by the Buhler solid-state heat treatment process. The Buhler process is gentle enough to retain the outstanding properties of the intermediate product (colorless, biologically degradable, high polymer structure uniformity) which distinguish the product manufactured by the new Japanese process. The result of the two process stages is PLA of unrivaled quality on an international scale.

Cooperation agreement
The Buhler Thermal Processes business unit has for years been supplying solid-state polymerization systems for making bottle-grade PET. In this area, it holds a market share of almost 70% of total global PET production. It also supplies recycling systems for recovering PET resin for making food containers from post-consumer PET bottles.

The Buhler specialists have now further developed their proven solid-state polymerization system for the new application of solid-state heat treatment of PLA pellets. This new system forms the basis for the cooperation agreement recently signed with the Japanese plant supplier mentioned above.

Additional improvements are possible
Despite the many benefits of polylactic acid and the attention that PLA is already enjoying today, a number of challenges remain to be mastered in order to further fine-tune the process. For one thing, lactic acid has up to now been produced from food-grade resources such as starch. Now intense research efforts are being made to manufacture lactic acid from non-food resources such as cellulose in order to avoid competing with food resources. On the other hand, PLA is still twice as expensive as plastics based on crude oil. But the price of PLA will drop to an acceptable level as the scale of production increases.

As a final point, fears are that some mechanical and thermal properties of PLA may turn out to be inadequate for certain applications. But techniques have already been developed to improve such inadequate characteristics, for example by compounding, which is also done with other types of plastics. Thus, through the formation of stereo-complex PLA, the heat resistance of the material improves to a melting point around 230°C.

Though PLA has a much reduced CO₂ footprint, not the entire quantity of PLA products is suitable for composting or incineration. A certain amount should be mechanically recycled in the similar way as PET bottles are being recycled today.

For more information on this subject, please contact:
Hideki Hara
Area Sales Manager
Thermal Processes Business Unit
at Buhler in Yokohama, Japan
T +81 45 477 3048
F +81 45 477 3030
M +81 80 1012 4628
hideki.hara@buhlergroup.com

Transparent PLA film is excellently suited for food packaging.
The new malthouse of Bairds Malt Ltd. in the Scottish town of Arbroath is an epitome of close collaboration between the customer and their contracting partners. The result is a malting facility based on a cutting-edge design and equipped with state-of-the-art plant components.

Epitome of partnership-based collaboration

Just like the production of beer, whisky production requires germinated barley – or malt – as a raw material. All the barley which is used for making malt for Scottish whisky is home-grown and also locally malted.

Beer and whisky

Bairds Malt Ltd. came into being in 1999 as a result of the merger of two successful malting companies: Hugh Baird & Sons Ltd. and Moray Firth Maltings plc, both of which supplied malt for both brewing and distilling use. The current headquarters of Bairds Malt Ltd. are located in Witham in Essex, England.

Today, Bairds Malt Ltd. operates five malting companies throughout the United Kingdom – the northernmost in the Scottish Highlands, the southernmost in Witham, Essex in southeastern England. The five malt-houses together produce 250,000 metric tons of malt annually, which is primarily supplied to breweries and distilleries throughout the UK. A small percentage of the total annual output is exported to countries which attach great importance to using British malt, in particular Japan and the U.S.

Capacity increase

Three of the five malting operations of Bairds Malt Ltd. are located in Scotland. Together, they boast a capacity of 175,000 metric tons of malt per year, making Bairds Malt Scotland’s leading malt producer. The strategic location of these three plants allows Bairds Malt direct access to locally grown barley from all of Scotland’s primary growing regions.

One of these three malting facilities is located in Arbroath, 15 miles north of the Scottish city of Dundee in the County of Angus and on the shores of the North Sea. Built in 1970, the malting operation of Arbroath was expanded for the first time in the 1980’s. When it became necessary to again adjust capacity to the rise in market demand, Bairds Malt entrusted Buhler at the end of 2007 with designing and constructing a complete new malting plant. This plant was officially opened on April 7, 2010 by Ruth Melville, local Provost for the Scottish Angus region. This marked the successful completion of a fascinating malting project, which had started with contract signing in December 2007. The new malthouse of Bairds Malt Ltd. is the first major investment made in Scotland’s malting industry in 25 years.

For more information on the Bairds Malt project, please contact:
Norbert Heide
Head of Engineering Business unit Malting Business Unit at Buhler in Braunschweig
T +49 531 594 2055
F +49 531 594 2006
norbert.heide@buhlergroup.com

The flat-bottom steep tank ECO Steep of Bairds Malt.
In each phase of the project, the customer attached the utmost importance to the plant design, execution details, sanitation, and proven performance in selecting their partners. Buhler was in a position to offer them high-quality, tried and trusted, fine-tuned process technology as well as innovative solutions – such as the ECO Steep steeping system and the washing screw. Stainless steel is the preferred construction material – the processing equipment, building lining, steeping tank and all plant components in contact with the product have been systematically made of this material.

Overall concept

The new malthouse of Bairds Malt is capable of producing 57,000 metric tons of malt each year. The size of an individual batch is 380 tons. In addition to the core process equipment, Buhler’s scope of supply also included the entire malt process building of steel. An overall concept was developed for the process building in cooperation with a partner company – KTG from Roth, Germany – in order to smoothly blend the machinery and plant components of the malting system with the steel building. To achieve this, the greatly restricted local space conditions also had to be taken into account.

New washing screw

The existing bulk storage installation and the old malting system were integrated in the new concept. The new equipment includes a flat-bottom steep tank ECO Steep BMWD steeping tank with a diameter of 21 meters; two BMKC germination boxes with a diameter of 26 meters inside a circular 35 meter tall tower; and a separate kiln of type BMDC with a diameter of 33 meters. For the first time ever, two newly developed washing screws of type BMRA were applied, each with a throughput capacity of 100 metric tons per hour. These screws separate the floating barley as well as cleaning and pre-moistening the barley itself.

Open atmosphere

This project was especially characterized by the open atmosphere that existed between all the partners involved as well as by their extreme solution orientation. Everyone shared one goal in designing and constructing this new malthouse – to create a special showcase facility for the customer Bairds Malt Ltd., for Buhler, as well as for the region and the entire malt market. Thus, numerous technical and technological details were swiftly solved in an uncomplicated and purposeful way. The result is impressive. All the targets in terms of schedule, quality, and costs were reached, despite the vagaries of the Scottish weather, which upset many a plan and required the utmost flexibility of everyone involved.

The construction of the plant and the result fully reflect the spirit of this project. Steve Haydon, CEO of Bairds Malt Ltd., put it succinctly during his address at the official opening dinner: “The determination of all the contracting partners to work together closely and in a cooperative manner across all stages of the project have enabled Bairds Malt to complete the new malting plant both on budget and on schedule.” (NH)
Change at Buhler South America

Effective June 1, 2011 Edi Boller will succeed Andreas Flückiger as head of Buhler South America. Andreas Flückiger will return to Uzwil and take up a new challenge. Edi Boller joined Buhler in 1990 as a sales engineer in the Thermal Processes business unit. In 1992, he was appointed head of this unit, which he successfully developed during his six years of activity in this function. Edi Boller then moved to the Chocolate, Cocoa, and Coffee business unit as head of technology, taking charge of the unit three years later. Under his direction, the Chocolate, Cocoa, and Coffee business evolved continuously, achieving an enormous rise in sales revenue and earnings. (ca)

ChinaCoat 2010 in Guangzhou

At the end of September, all the important players along the value chain of the printing inks and coating industry gathered at the ChinaCoat 2010 in Guangzhou, China. The exhibition team (photograph) of the Buhler Grinding & Dispersion business unit presented Buhler’s comprehensive competencies in the field of wet grinding and dispersion technology. Especially intended for the Chinese market, an embedded recirculation system including SuperFlow™ technology was displayed for manufacturing packaging printing inks. In addition, the new Trias™ three-roller mill was shown for the first time in Asia. The event attracted visitors from all over the world, but especially China, South-east Asia, Japan, Korea, India, and the Middle East. Compared to the trade fair held in 2009, a recovery of the industry could be clearly felt. (lm)

Distinguished guest

In early October, President of the Swiss Federal Council Doris Leuthard visited Jordan. During her two-day visit, she toured two companies in Jordan. During her two-day visit, she toured two companies in Jordan. One of them is South Amman Mill. This large-scale flour milling plant supplier in the field of grain management. The company possesses proven know-how in the drying, storage, and handling of grain as well as in the malting industry. In addition to a detailed description of the history, development, and current situation of the animal feed markets of Italy, the report also includes an evaluation of the grain processing business unit and the push global growth in this area. Buhler and Schmidt-Seeger together can offer customers new possibilities in the integration of the entire value chain and thus contribute significantly to assuring the quality and retraceability of foods.

Buhler acquires Schmidt-Seeger

Buhler has acquired the German company Schmidt-Seeger. This strategic acquisition will supplement Buhler’s portfolio in the field of grain processing. The acquisition of Schmidt-Seeger allows Buhler to further strengthen its Grain Processing business unit and to push global growth in this area. Buhler and Schmidt-Seeger together can offer customers new possibilities in the integration of the entire value chain and thus contribute significantly to assuring the quality and retraceability of foods.

Schmidt-Seeger is headquartered in Beilngries north of Munich (Germany) and operates additional production facilities in Döbeln near Dresden (Saxony, Germany) and in Delhi (India). Schmidt-Seeger is a global plant supplier in the field of grain management. The company possesses proven know-how in the drying, storage, and handling of grain as well as in the malting industry. Schmidt-Seeger will be integrated as an affiliated company in the Grain Processing division of Buhler. Its site in Beilngries will be developed into a Buhler grain management center of competence. The German Federal Cartel Office has already approved the acquisition.

Imprint

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T +41 71 955 24 29
F +41 71 955 38 01

Publisher:  Corina Atzli (ca)
Editor in chief:  Head Corporate Communications
Authors:  Jürgen Fischer (jf), Wolfgang Gruber (wg), Jens Ostergaard (jo), Shelly Rider (sri)

Coordination:  Marc Ammann, per4m & partner AG
Design / DTP:  Isabelle Hauser, per4m & partner AG
Image & Design:  Handtmann
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Imprint No. 21

The 21st issue of Diagram published in September 1958 held a surprising innovation in store for its readers. For the first time, “Buhler Brothers” addressed the magazine’s readership through an editorial. In it, they draw their readers’ attention to the almost century-old history of modern roll milling technology. “Our company has been involved in this entire development and has always greatly contributed to it,” say the undersigned Buhler Brothers. And directly addressing their “valued customers,” they continue: “By acquiring a Buhler roller mill, you so to speak also become the owners of century-old experience in grinding process technology.”

The seven pages that follow are excellent examples of marketing language, with praises of the advantages offered by the Buhler MDDC roller mill with its reduced roll length, the operating principle of the new PLANO-STAR plansifter, and the qualities of the MQRC purifier with its three screen decks. After the presentation of these three core system components of flour mills, the Diagram issue No. 21 presents a rather “exotic” piece of equipment in a detailed description of a mobile roll grinding unit. The unit, which is transported in a noble wooden box, is installed in roller mills, where it grinds dressers, cameras with the rolls without requiring their removal.

Finally, the Diagram No. 21 concerns itself with the Italian feed manufacturing industry. In addition to a detailed description of the history, development, and current situation of the animal feed markets of Italy, the recently installed batch system of Consorzio Agrario Provinciale in Piacenza is presented down to the last details.

Diagram No. 21

The mobile roll grinding unit of Buhler.

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Cover of Diagram No. 21

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