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A customer magazine
of the ABB Group

robotics



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Power and productivity
for a better world™





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Bengt Stom
Global business line manager,
Packaging ABB Robotics

Welcome to a special issue of ABB Robotics where we delve into the world of food and beverages. It's an exciting and dynamic industry, where consumer needs and wishes often steer the trends.

Our Content and Editorial Manager, Nick Chambers, forecasts some of the hottest trends and where they are headed (page 14). He reveals, among other things, that more and more people are choosing ready-made food, at the same time that an increasing number of consumers are interested in health and having fresher food products.

The demands are equally high within the beverage industry. Regardless of whether it's milk or beer, products need to reach the market fast. There are plenty of thirsty consumers out there who are only satisfied with their own favorite brand.

ABB's robots are flexible, fast and adaptable – even when it comes to strict hygienic demands – as this issue of ABB Robotics clearly highlights with stories from companies on different continents that have chosen ABB for robotic solutions.

In Brazil, Piracanjuba, one of the country's biggest dairy producers, applied a new palletizing solution that has not only increased efficiency, but has also reduced the company's costs. Discover how this was achieved on page 8.

Coppenrath & Wiese in Germany has invested in an advanced robotic solution (page 19) that picks the thousands of frozen desserts produced by this family company every day. Find out how pasta company Molino in Argentina (page 16) is working more efficiently or read about Australia's biggest palletizing system on page 21. These are just a few tasty samples in this issue.

Food and drink are always exciting and in combination with robotics, they are sure to become even more interesting. We hope that you will find this issue enjoyable and useful. If you have any questions or comments regarding the magazine, please don't hesitate to contact us.

**Best regards,
Bengt Stom**



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Events calendar 2014

Come and see ABB's newest solutions at the following events:

> June 22 - 25
FoodPro 2014,
Melbourne,
Australia

> September 8 - 13
IMTS 2014,
Chicago, USA

> October 7 - 10
Tokyo Pack 2014,
Tokyo, Japan

News

RacerPack provides gentle product handling with vacuum suction cup grippers designed to pick up almost any kind of product.



Ahead of the Pack

The RacerPack picking and placing application provides greater flexibility while accommodating a wide range of packaging designs.

RacerPack is an application for the ABB IRB 360 FlexPicker® robot, designed for high-capacity collating, picking and placing of products onto trays, cartons or feeding of other machinery.

Picking and packing can be done with high accuracy from indexed conveyors, even when the conveyor accelerates

or decelerates. RacerPack provides gentle product handling with vacuum suction cup grippers designed to pick up almost any kind of product.

For the past decade and a half, the IRB 360 FlexPicker has been the gold standard in precision picking and placing applications. RacerPack incorporates

the FlexPicker into a single stainless steel cabinet with panel-mounted controller, custom grippers and in-feed conveyors for large-scale collating, picking and placement applications.

Building on the FlexPicker's outstanding motion performance, short cycle times, high accuracy and capacity, the RacerPack can handle payloads of up to 300 grams at a rate of 450 items per minute. The system's customized collating grippers can pick up a wide variety of parts.

Its user-friendly human-machine interface is designed for quick product changeover and easy integration into new and existing product lines. A single operator can swap out product types in as little as 10 minutes.

> November 2 - 5
PackExpo,
Chicago, USA

> November 17 - 20
Emballage,
Paris, France

> November 19 - 20
PackEx,
Montreal, Canada



+ Key Features:

- Picking and packing with high accuracy from indexed conveyors, even when the conveyor belt is accelerated or decelerated
- Gentle product handling with vacuum suction cup gripper designed to pick up almost any kind of product
- User-friendly HMI with recipe handling for product change-over and production monitoring
- High availability and capacity up to 450 products/minute
- Scalable, hygienic, modular design
- Fast and easy integration into existing or new lines

Picking lines get a boost

The Picking PowerPac eases the complicated task of designing a picking system and optimizes performance.

The Picking PowerPac, drawing on ABB's more than 25 years of experience in robot programming innovation, is an easy-to-use add-on for RobotStudio® and PickMaster 3 software. It boosts the performance of picking lines with thorough optimization in the virtual world before the line gets built in the real world.

With the Picking PowerPac, risks in designing a picking line, such as the variations in the product inflow, can be tested and minimized, and the complicated task of designing a picking system becomes more accessible than ever. The software even allows for the improvement of existing lines that were configured using PickMaster 3 by recording current product flow with cameras and then feeding it into the Picking PowerPac to validate and optimize the system.

The Picking PowerPac allows both novice and experienced users to easily design picking installations and create simulations of the systems that will eventually run in the real world. Within the Picking PowerPac, robots and other system elements are "configured" rather than programmed, saving up to 80 percent in programming time when compared to traditional methods.

Using the Picking PowerPac during a picking system's design phase

enables you to easily resolve big-picture questions such as where to position the robots for maximum output. In the virtual world you simply move, add or remove robots and move conveyors around until all positions are reachable, optimized and verified within the picking cell. Programs can then be tuned for speed and process efficiency, and cycle times verified and optimized before system build-out or start of production.

With the Picking PowerPac, users do not have to write a single line of code. Instead they select product and container types and set simple parameters, such as product sizes, container sizes and patterns. The software then creates the program ready to simulate, test and fine-tune, saving valuable time and proving your solution before real-world mistakes are made.



With the Picking PowerPac users do not have to write a single line of code.



Versatile lupins on the rise

A high-speed, flexible robotic packing solution helps an Australian food manufacturer meet rising global demand.

Text & Photos: ABB

Around the world, lupins – part of the legume family that includes the likes of soybeans, peas and lentils – are experiencing incredible growth in consumer demand. They are a rich natural source of protein and fiber, are easily digestible, cholesterol-free and provide a convenient and healthy option for consumers who have celiac disease or simply want to follow a gluten-free diet.

In Australia, lupins play a vital role in the ecological balance of agriculture. West Australian manufacturer, Lupin Foods Australia, specializes in a range of foods based on Australian sweet lupin, which has been developed to meet the growing demand.

Lupin Foods Australia, a wholly-owned subsidiary of global farmer cooperative

CBH Group, now exports packaged lupin products to markets as wide-reaching as South East Asia, the Middle East, North Africa and Western Europe. The company has been carving out its niche in the health food market since 2006, with offerings including Lupin Tempe, Lupin Dahl, Lupin Falafel and Lupin Carrot Cake.

When Lupin Foods Australia required a robotic solution to streamline its packing processes, it called on local ABB Authorized value provider and robotic automation specialist Robotic Solutions WA to design a system that could simultaneously lower palletizing costs and keep up with rising output levels.

Lupin Foods Australia General Manager, David Fienberg says the company contacted Robotic Solutions WA due to their track record of innovation and their use of equipment combined with a solid reputation from ABB.

“We looked at many robots and control systems and found Robotic Solutions’ offering was the most capable of adapting to our environment and growing with our business. ABB has a very strong name in Western Australia and around the world – in a diverse range of industries – and we were therefore confident that the support we’d receive would be more than sufficient to meet our needs,” he explains.

Lupin Foods Australia also required a high-speed, efficient system with the capacity to adapt as the business grew.

“We developed a solution that allows us to produce 900 20-kilogram bags per hour, and stack them in such a way as to minimize our freight costs. The system has allowed us to remove wooden pallets from our process entirely, and therefore take advantage of the full capacity of our shipping containers. It also eliminates damage to our bags,” Fienberg says.

Lupin Foods Australia has enjoyed a number of operational improvements since employing the ABB robot, including increased packing speed and productivity, mitigation of health and safety risks and simplified worker training.

“The ABB robot is very quick, its maintenance is extremely low, and the addition of PLCs makes it really simple to use. The equipment is reliable, and we are able to adapt it to the business as we go,” says Fienberg.

“Accessing high-quality food manufacturing labor has traditionally been a real challenge for us in Western Australia. However, using the solution we’ve developed around the robot, training is now simple.



“We only use ABB robots. They’re very reliable, and there’s a huge range which makes selecting a robot for any application very easy.”

David Woodhouse, Robotic Systems WA Director

While it has given us the ability to reduce our labor requirements, we have also been able to mitigate health and safety risks associated with lifting 20 kilogram bags – because injuries to staff are the last thing we’d ever want,” he adds.

Robotic Solutions WA specializes in robot-based automation solutions for palletizing, materials handling, assembly, welding, painting and inspection in a variety of manufacturing sectors. The company offers in-house system design, engineering, manufacturing and testing facilities, and also provides all necessary training, technical support and aftersales service.

Robotic Solutions WA Director, David Woodhouse says the company has been an ABB Authorized value provider for eight years.

“We only use ABB robots. They’re very reliable, and there’s a huge range which makes selecting a robot for any application very easy.”

According to Woodhouse, Lupin Foods Australia specified a high-speed system that was reliable, user-friendly and locally supported. “We provided them with a turn-key system which included the system design, the robot, the gripper, the bag pick-up conveyor, everything inside the robot cell, all the safety fencing, and technical aftersales support and training,” he explains.

The resulting solution is based on an ABB IRB 460 high-speed robotic palletizer; the compact, 4-axis robot is designed specifically for end-of-line and bag palletizing, occupies 20 percent less floor space, and runs 15 percent faster than its near-

est rivals.

“The ABB IRB 460 robot is ideal for this application – it is a very fast, lightweight palletizing robot that can achieve very fast cycle times. We’re currently palletizing 15 bags per minute but there is scope there to go a lot faster if required,” Woodhouse says.

He points out that the Lupin Foods Australia application is unique due to its absence of wooden pallets.

“We don’t have a pallet as such. The robot picks and places a plastic slip-sheet onto the roller conveyor. The robot then picks, clamps and places the bags onto the slip-sheet unit the stack is complete. The stack is then conveyed out of the robot cell and placed into a shipping container. And since we were able to use a standard gripper design, Lupin Foods Australia now has the option to introduce traditional palletizing down the track, if the business requires it.”

Also unique is the speed at which the robot is working, and the flexibility of the robotic system. Lupin Foods Australia is able to select any of its different product types using the PLC, and the robot will alter the way it positions the bags to suit their size, including the number of bags it places per slip-sheet, and the number of layers per container, constantly working to maximize container space.

“We feel we have been able to provide a reliable and flexible system that not only allows the customer to keep their costs down, but truly offers the ability to be tailored to the client’s needs,” says Woodhouse.

Churning out milk products

With ABB robots doing the palletizing work, dairy producer Piracanjuba was able to stay competitive and use its staff more efficiently.

Text: Cari Simmons **Photos:** ABB

Butter, powder milk and UHT milk are some of the products made from the 2.3 million liters of milk that are processed daily at Piracanjuba's facility in the state of Goiás, Brazil. Piracanjuba, which is one of Brazil's main dairy producers, has three plants in the country with a total production capacity of more than 3 million liters of milk a day.

Forty percent of the milk at the Goiás facility, is processed on Tetra Pak Ultra High Temperature (UHT) production lines. The UHT treatment sterilizes the dairy products by removing any micro-

organisms, enabling customers to store milk for longer periods of time. The facility has 13 Tetra Pak lines working 24 hours a day, 7 days a week.

Normally, each of these lines can produce from 15 to 25 boxes per minute, requiring about three employees per shift. Since almost all of the milk producers in Brazil have three shifts per day, each line must have about nine employees dedicated to palletizing. This results in higher labor costs for companies with high production capacity.

In the past, all of Piracanjuba's products were palletized manually by about 75 employees in a repetitive and rather tiresome physical task. In order to stay ahead in Brazil's highly competitive and price sensitive market, Piracanjuba and ABB began discussing how a robotic solution could be adapted to suit the facility's layout and needs and help the company to reduce costs, gain productivity and use staff more efficiently.

In 2013, ABB's regional application center in Brazil began working with the



The Goiás facility has 13 Tetra Pak lines working 24 hours a day, 7 days a week.





Piracanjuba

Piracanjuba is one of the biggest dairy product producers in Brazil, with three plants in the country. The biggest facility is located in the state of Goiás, where 2.3 million liters of milk are processed daily into various products such as butter, powder milk and UHT milk products.
www.piracanjuba.com.br

company to automate its palletizing process with a robot that could pick the maximum amount of boxes per cycle without losing time. This resulted in the design of a new layout for high-speed box palletizing solutions along with a special gripper for the IRB 660 industrial robot that was able to pick different amounts and types of boxes without the need for a special setup. This project was such a success that it has become a standard solution for all of Piracanjuba's UHT products. Now the same solution will be applied with other customers in Brazil as well as shared with ABB units worldwide.

In addition to that, it was decided that all of the routines and communication between the robot solution and Piracanjuba's equipment would be done directly by the robot controller, eliminating the need for a PLC (Programmable Logic Controller).

"ABB was able to adapt its solutions to our facility's layout and needs," says Wagner Paschoalim, Production Manager, Piracanjuba. "We were impressed by

how a big project could be managed so easily without any major problems and our management team was pleased that ABB maintained the key responsible people in the project from the beginning until the end."

The dairy producer was able to achieve its goals regarding costs, quality and speed, he adds: "We were able to reduce our workforce in the palletizing area, and make better use of our employees in other functions or departments, where they could gain responsibility by doing more advanced activities. This allows Piracanjuba to keep growing in a fast and competitive way."

Today, the robots are working 24 hours a day and Piracanjuba is ready to begin the next project – installing five more ABB robots in its facility in Southern Brazil.

Scan the QR-code (right) to see the application: Palletizing cell for carton package products.



Roll out the barrels

World-famous German brewery Rothaus, maker of the famous Tannenzäpfle beer, just modernized its operations with the introduction of four ABB robots.

Text & Photo: ABB

High up in the Black Forest in southwestern Germany sits the 221-year-old Rothaus (Red House) brewery. The beer brewed here has achieved a cult status among German beer drinkers. Today the brewery is equipped with the latest in modern technology, including four ABB robots that handle the beer kegs and cases.

In the past the way Rothaus used the so-called keg system to handle its beer created a bottleneck. It managed only 120 barrels per hour and could also only process the German DIN-keg size. Other units, such as Euro-kegs, had to be palletized manually. Kegs are cylindrical reusable barrels, usually made of stainless



steel, with a capacity of 20 liters, 30 liters or 50 liters.

Rothaus wanted to increase the flexibility in the area of keg filling, without a costly change in the process because of the increasing number of different keg types. In addition, the brewery wanted to eliminate gaps in production and have the same detailed documentation as before. Together with ABB partner Albert Frey Dienstleistungs AG, a plant system producer for breweries and the beverage industry, Rothaus developed the new management concept.

Instead of the conventional palletizing facility, two ABB IRB 6640 robots now load and unload the kegs and handle the pallets. The robots can grasp all keg

types and sizes without changing the robot or its gripper. At the starting point of the system two or three stacked pallets, each loaded with six kegs, arrive on a conventional stacker. The pallets are isolated and returned to the unloading station. The robots then grasp each keg in succession, rotate it 180 degrees so the valve comes down to the bottom, and put it onto the conveyor belt.

“They couldn’t be more reliable and low-maintenance,” says Robert Jäger, the Rothaus employee in charge of the beer-filling operation, “and in comparison to the earlier gantry unit they take up a lot less room, too.”

Once the pallet is empty, it goes over to a test loading robot. At the end of the plant two other IRB 6640 robots take the packages, and put them on an empty pallet. When it is loaded, it goes automatically to the next one. The filled pallet is transported for shipment and the process begins again. If there are errors when cleaning or filling, or if the pallet is damaged, the robot sorts it out.

Only 10 percent of the Rothaus beer ends up in kegs; the rest goes into the attractive bottles so loved by beer drinkers in the country. Of the bottled beer, one in every eight is sold in a six-pack – and here again, an ABB robot has a hand in passing around the beer. Since 2005, an IRB 6640 robot has been assisting the automated packing machine in which a 24-bottle crate is repacked into four six-packs. The IRB 6640’s arm can effortlessly whisk its 142 kilogram load onto a conveyor belt.

The beer crates come tied together, for safety during transport, in a four crate wide, two crate deep configuration. Removing the safety band is the job

“RobotStudio is an unbeatable tool. We know no other product of this kind.”

Hans Wegele

of the fourth member of the ABB robot team: the small IRB 140. Project leader Ralf Krieger, is also pleased with the ABB products. “Like the two robots in the filling area, these two were also brought in to service really quickly,” he says.

All changes between keg types and sizes are handled by the software. With ABB’s RobotStudio software, users can perform every installation in the system via a computer. The system can also be used while the robot is working and allows for remote maintenance via the computer.

The software checks the residue in the keg, capacity and pressure conditions as well as correct temperature and cleaning and rinsing agents. The brewery staff has access to the RFID code of the transponder, which is associated with each keg. The life cycle of the kegs and the maintenance work is also recorded using RobotStudio.

“RobotStudio is an unbeatable tool,” says Hans Wegele. “We know no other product of this kind.”

These are words that the ABB team members like to hear – maybe they will celebrate them by clinking together some of those attractive foil-topped bottles.

Scan the QR-code (right) to see ABB robots handling beer kegs and bottles.



The beer crates come tied together, for safety during transport, in a four crate wide, two crate deep configuration. Removing the safety band is the job of the fourth member of the ABB robot team: the small IRB 140.

Monastic past

The state-owned Rothaus brewery is located in the hills of Germany’s Black Forest, at 1,000 meters above sea level. It was originally founded in 1791 by the nearby St. Blaisen monastery, but was transferred to the Grand Duchy of Baden in 1806. Sales of the brewery’s beer remain strong even today.



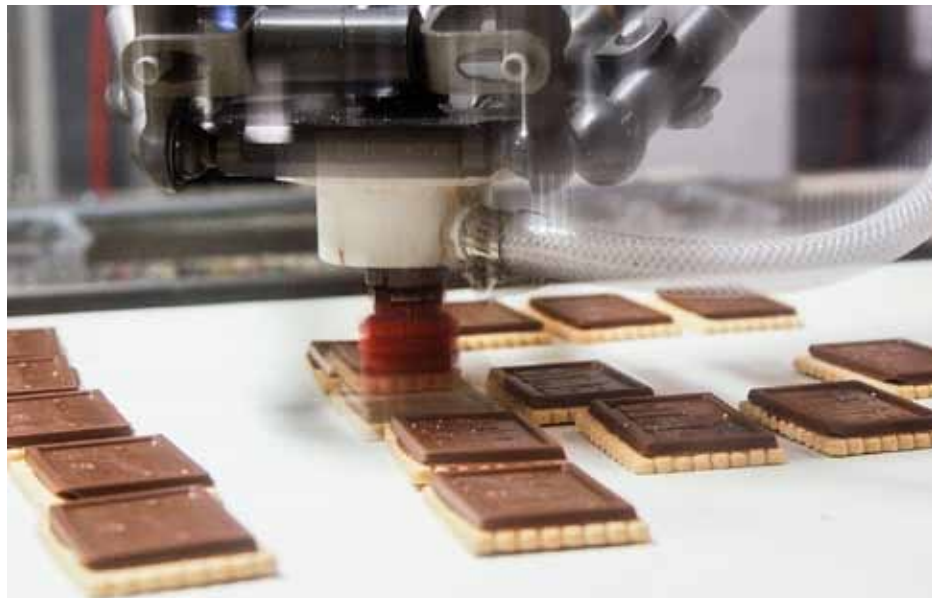
Feeding food packaging

With a combination of tenacious experience and engineering, JLS Automation is out to change the food packaging industry – one robot at a time.

Text & Photos: ABB

Over the last decade, JLS Automation, based in Pennsylvania, USA, has become one of the go-to companies for helping primary food packaging customers switch to robotic automation. Established in 1955, JLS was the brainchild of Joseph L. Souser, father of current President and CEO Craig Souser. Since then, the company has developed a dynamic background and gone through several changes. Ultimately, the company decided it needed to choose a market that showed solid growth potential.

“We’re very bullish on where the food industry is today and where it could go,”



Sanitation and the highest levels of cleanliness are vital in the food industry. JLS equipment coupled with ABB's FlexPicker robots easily meet the need for high standards.

JLS Automation

JLS Automation, based in Pennsylvania, USA, is focused on primary and secondary packaging systems. The company has transitioned from a sales channel for other motion control products to being a provider of solutions for selected markets.

says Craig Souser. "When we made the switch we felt the food industry was very stable, and that has proven to be true. Food, in general, has not had a significant amount of automation to this point but modern packaging equipment is so

fast that people can't keep up with it. Robots are able to allow the next level of technology to be implemented."

Starting about 15 years ago, JLS began building its own gantry robotic systems, but as prices for industrial robots were coming down and new technologies emerged on the market, JLS saw an opportunity they couldn't pass up: signing on to integrate ABB's FlexPicker "delta-style" high speed robotic pickers.

"Robotics didn't exist in 1955 when we started, but when the FlexPicker came along in the early 2000s we got on board very quickly—and we've been a FlexPicker house ever since," says Souser. "Originally we saw primary packaging as the only segment that the FlexPicker was going to work in. However, today we're doing a lot of work in the secondary packaging segment and have developed some solutions for that market. As technologies have changed and our experience has grown we've been able to use robots for applications that we never imagined early on."

Designing robotic automation solutions for the modern food packaging industry can be very tricky. Consumer demands are changing all the time, and packagers have to be able to modify their product strategies very quickly—sometimes on a minute-by-minute basis.

"Primary products are very challenging to work with," says Souser. "These types of products change state quickly, so it's important for us to understand the dynamics and listen to the customer.

We had to not only develop good tooling, which is fundamental, but also work on the flow of products. We often talk about FlexPickers being like airplanes: if they're not moving they're not creating any value, so we need to keep the robots productive and cycling at very high speeds."

Another major issue unique to the food industry is sanitation and ensuring the highest levels of cleanliness on the production and packaging lines. When JLS's equipment is coupled with ABB's FlexPicker robots, those exacting sanitation standards can be easily met.

"Over time we've had to become very skilled in high sanitary design," says Souser. "Virtually everything we do is stainless and almost everything we do is capable of being in a wash down environment. We have different levels of sanitary design, but they're all fundamentally meant to get wet, and usually do."

ABB was the first company to commercialize the delta-style high speed picking robot, and is still the dominant player in this regard. It is this long history and experience with the FlexPicker robots that JLS values.

"We're very proud of the relationship we have with ABB," says Souser. "What we've found is that despite the fact that they're a huge global company, they do listen to their customers."

Scan the QR-code (right) to see ABB's robots primary food packaging solutions.



Masters of flexibility

The Food and Beverage industry is changing rapidly. ABB and its partners are providing the expertise and robotic solutions to meet the flexibility required by these new demands.

Text: Nick Chambers Photos: ABB

If you're involved in the Food and Beverage industry you know quite well that it has undergone some dramatic changes in the recent past—and have likely experienced them firsthand. Whereas once it was commonplace to have long production runs and a relatively limited group of standard package sizes, end-users are now more interested in on-demand packaging, short production runs, mix-and-match variety packs and individualized packaging configurations.

In addition, the time between ordering a new production line and the start of production is shrinking while the containers are becoming more intricate and portions more uniform in order to be pleasing to consumers.

Around the world more and more people are eating packaged foods and buying consumer goods in association with an increased standard of living and population growth. Lifestyle changes associated with

this increase mean people are cooking less and depending more on processed or pre-made items. Consumers are also becoming more health conscious and demanding fresher products, which requires shorter delivery times.

At the same time competition between food and beverage brands, as well as distributors and retailers, is fierce, and packaging plays a greater role in this battle for consumer eyeballs and loyalty. Food safety is also an increasing concern, so much so that the desire for food and beverage products that have been untouched by human hands during their processing is rising.

When all of these factors are taken together, it's enough to make even the most hardened production supervisors lose sleep – or even hair.

Flexible robotics can help

Equipment manufacturers are realizing the truly profound impact they can have



on the profitability of a Food and Beverage operation by the way in which they design a solution – and the smart ones are responding by thinking outside of the conventional box.

By replacing conventional machines with industrial robots, the headaches associated with the demands of the modern Food and Beverage industry can be met head-on. Six-axis robots provide the flexibility needed for incredibly dynamic production environments, while sacrificing none of the speed or accuracy of conventional equipment.

With robotic automation it becomes an easy task to change package styles and configurations as the market demands, as well as change production lines quickly to remove unpopular products and introduce new ones. In fact, some processors these days may only have 20-40 minute runs or very short contracts to produce a particular item. A common misperception is that



Automated systems ensure better hygiene by keeping human hands off food products.

robots are only suitable for long runs of the same product when in reality a robot typically has the fastest changeover once programmed and can adapt quickly to changing production contracts. Robots can also drastically shorten the time between production and delivery to a retailer, thereby allowing for the sale of fresher products.

Food safety concerns regarding contamination and tracking products as they move through the system are also addressed by robotics due to the nature of automated systems and the lack of human hands touching the product.

Addressing challenges

To this point, the Food and Beverage industry has operated on a fairly low level of technology and the thought of employing robotics has remained a daunting task. To automate these kinds of operations it is a must to have tools that enable more integrators and end custom-

ers to incorporate and maintain robotic systems. Increasing ease of use and developing standardized function packages are therefore essential for the industry.

At ABB we have addressed these issues with many new products, including PC-based programming and simulation tools such as Pickmaster 3, our Picking PowerPac and our Palletizing PowerPac, as well as standardized solutions such as our Integrated Vision, RacerPack flow packaging solution, and other plug-and-play function packages. We have also increased the flexibility of our robots with an entire family of IRB 360 FlexPickers, a family of palletizing robots and 6-axis articulated robots to meet virtually any requirement.

ABB's aim is to decrease the perception that robots are a specialized piece of production equipment that requires too much training and effort to integrate. In reality, they are the masters of flexibility and should be seen as a standard item

for those operations that want to remain competitive.

Over time, robots have proven themselves critical to creating the flexible, agile and speedy solutions that today's Food and Beverage operations need to remain competitive. Modern robotic systems from ABB and its partners can deal with speeds and situations that humans simply can't, as well as handle things that were previously thought to be impossible to automate. They can fit into very small footprints and eliminate the conventional equipment that typically needs large, fixed spaces to work.

In short, industrial robots can now handle almost any task required by the Food and Beverage industry, but it takes a team of knowledgeable experts to help your operation make the leap. With ABB at your back, you know that expertise is available anytime and anywhere – for any type of project.

Pasta, present and future

The biggest branded food producer in Argentina stacks delicate bags of pasta faster and more efficiently with robotic automation.

Text: Charles Newbery **Photos:** Eduardo Gil

At Molinos' Rio de la Plata's dried pasta factory outside Buenos Aires, Argentina, the floor is almost spotless. An automated system moves a handful of the 240,000 bags of daily produced pasta swirls and cylinder-shaped mostacciolis from a mixing station to bagging and stacking on pallets without ever touching the ground.

Argentina's biggest dried pasta maker, with its fast-growing Lucchetti brand, is speeding up production processes and improving product quality with robotic automation. This is helping it keep up with demand and maintain a competitive edge in this pasta-loving country.

And talk about good timing: Molinos first turned to ABB robots in 2008, the same year that ABB Argentina began working with palletizing applications. The latest installation at the plant is an IRB 660 floor-mounted palletizing robot at the Lucchetti plant.

"We have been designing, manufacturing and commissioning cells with nearly 15 robots installed since then," says Ulises Strangis, ABB Robotics Project Manager. "During this time we have customized several kinds of mechanical and vacuum grippers."

With a reach of 3.15 meters and 180 kilograms of payload the robot turns, twists and lowers its large arm to scoop up bags of pasta and neatly stack them on pallets, alternating between two conveyor belts feeding it up to 240 bags a minute. The gripper lays a sheet of kraft paper between each stack. A forklift driver then moves the completed pallets to a machine that secures it with a plastic film before another forklift operator hauls them to an adjacent distribution center brimming with ready-to-ship pallets.

Molinos has installed six ABB robots at the Lucchetti plant, which has increased productivity by 10 percent, says



Robot benefits

- Increase in productivity: 10 percent
- Lower labor costs
- Easy to design automation process with RobotStudio Palletizing PowerPac simulation software
- Changes made without fiddling with hardware

The latest addition to the Molinos facility, an IRB 660, neatly stacks up to 240 bags of pasta a minute.



Production Manager Robert Hagen. “That’s a huge number for us,” he says.

Another upside is “an easier flowing process at the end of the line,” says Hagen.

Flow is vital for feeding the high demand for pasta in Argentina, the world’s ninth largest dried pasta market according to Euromonitor International.

In 2009, when Molinos came out with a catchy advertising campaign for Lucchetti, the company saw its share of the dried pasta market surge to 14.2 percent by 2011, up from 11.8 percent in 2008 ac-

ording to global marketing research firm ACNielsen.

To keep up, Molinos turned to ABB to help design an automated and continuous production line. “A manual solution was out of the question,” says Molinos Process Engineer Javier Holoveski. Loading each 7.5 to 10-kilogram set of pasta bags on the pallets is an expensive and strenuous job that had led to recurring injuries on older lines.

Increased automation also helps Molinos compete against smaller manufac-

turers that have lower cost structures, and to sustain profits even as 25 percent annual inflation pushes up fuel, ingredients, labor and packaging costs.

“We can compete if we are efficient in making a large production quantity,” Holoveski says.

All of these considerations went into the design of the new palletizing robot.

Molinos had previously installed five such robots, with two starting on the Lucchetti spaghetti line and another on



Further automation is planned for the Molinos facility which will speed up end-of-the-line processes even more.



the Lucchetti swirls and mostacciolis line in June 2009.

This time, however, the company wanted a system that could do even more. What clinched the deal was the RobotStudio Palletizing PowerPac simulation software, which Holoveski confides is as fun for an engineer as a video game. Molinos and another Argentine company were the world's first to use this powerful simulation software.

The factory managers played with the 3D program for three months, experimenting with different processes and bouncing ideas off each other and ABB's team. "Sometimes it can be hard to explain what's in your mind, but when you see an image you can explain it better, and this leads to more ideas," Holoveski says. "Each idea can fix a future problem and save time and money."

After exploring five designs, they settled on one with improvements such as programming the gripper's movements to avoid crushing the pasta when picking up the bags. The software was then downloaded to the robot in a few minutes and operations started, saving the company six to eight months in detecting, confirming and reengineering glitches of new machinery.

Molinos Rio de la Plata

Founded in 1902 by Ernesto Bunge and Jorge Born, Molinos Rio de la Plata has grown from a wheat miller to the biggest branded food products maker in Argentina. It operates 20 manufacturing plants and 10 distribution centers and employs 5,000 people. Initially specializing in wheat processing, Molinos has expanded into animal feed, pasta, rice, chicken nuggets, coffee, frozen hamburgers, margarine, sausages and vegetable oils. Today it meets 11 percent of food demand in Argentina and exports to more than 50 countries. Expansion picked up pace after Argentina's Perez Companc family bought control of the company in 1999. Under the family's control, Molinos has expanded into the commodities business, biodiesel and wine, helping to diversify revenue streams. The latest ventures include the purchase of a stake in an Italian gourmet food maker and the takeover of a Chilean food company.

The final design choice also allowed for other ABB products to be implemented.

"After selecting the design, we thought about including automation control systems, low voltage products and enclosures from the ABB group," says Ulises Strangis.

Further improvements can be made. Molinos is working with ABB on speeding up the end-of-line process so the pallets run automatically to the plastic wrapping machine, halving forklift duties to one operator. Another plan is to update the robot palletizing application to stack pallets

higher so trucks can be filled to the brim, making better use of transport capacity. Molinos also wants to add a sheet of paper under the first layer of bags to protect them from the rough wood of the pallet.

"The good thing is that we're never talking about hardware, only software," Holoveski says. "This makes it a lot easier to make changes."

Scan the QR code (right) to see how ABB robots stack delicate bags of pasta faster and more efficiently.



Innovative products from ABB

Integrated Vision

ABB Integrated Vision is a powerful smart camera system that makes vision-guided robotics applications faster and easier to deploy than ever before. Using 2D vision guidance, manufacturers have the ability to track products more accurately, improve supply chain management,

improve quality, troubleshoot challenging lines and processes and significantly expand their use of robotic automation. Vision-guided robotics can save time, money and resources, all of which significantly improve a company's bottom line.



Commissioning

ABB will introduce three new apps for robot commissioning to complement the pre-existing "Manage" app. The new apps include "Tune" for editing programs, "Adjust" for robot calibration and "Jog" for manual control of the robots. Altogether these four apps represent the future of robot commissioning on the shop floor and are designed to run on tablets using Windows 8.1. Each app will be

available in the Microsoft Windows store when RobotStudio 5.60 is launched.

ABB's simulation and offline programming software, RobotStudio, allows robot programming to be done on a PC in the office without interrupting or shutting down production.

A robot that is well commissioned will run better, be more reliable, use less energy and have a longer life.



PickMaster options

ABB's PickMaster is a sophisticated tool for guiding high-speed robots in the packaging process. The PC-based software product uses comprehensive graphical interfaces to configure powerful applications to control up to eight robots along conveyor belts.

A camera is calibrated using a special grid to indicate the size and location of the part on the conveyor. The 3D scanning locates each object precisely on an x-, y- and z-axis, allowing the robot to pick up and pack any type of small object, from delicate croissants coming straight from the oven to chocolate pra-

lines with round toppings.

There are two PickMaster products to choose from, PickMaster 3 for packaging objects on a conveyor and PickMaster 5 for palletizing applications. Both use the same graphical design concept and software structure so that users can easily understand both products.

PickMaster 3 uses a high-performance, robust vision system to pinpoint random objects. Powerful quality-inspection tools let you categorize your products and make sure the defective ones are sorted out.



FlexGripper Claw

ABB's FlexGripper Claw is an easy-to-install tool that can be combined with ABB's IRB 460 or IRB 660 palletizing robots for high-speed palletizing of bags. The FlexGripper Claw has been updated with a new pneumatic motion for lateral steering. Objects can now be placed with even better precision thanks to this lateral steering that holds goods in place when the claw opens. This lateral steering also

contributes to holding the goods in position while the robot is in motion. The FlexGripper Claw is easy to program with its standardized Graphical User Interface (GUI). A pick-and-place test can be done with a single click. The FlexGripper Claw can handle bags of up to 50 kilos containing a variety of contents. It contains stainless steel parts and is user friendly even in the toughest of environments.



A taste for productivity

Delicious, creamy and alluringly tender, Coppenrath & Wiese's baked goods get from the oven to your belly with the help of IRB 360 Flex Pickers and IRB 4600s.

Text & Photos: ABB



For cake lovers, Mettingen in North Rhine-Westphalia, Germany, is a mouthwatering paradise. It's home to family-owned frozen dessert maker Coppenrath & Wiese, whose ovens bake around 260,000 cream cakes and three million rolls every day. The company also makes strudels, biscuits and cream rolls on 25 highly flexible production lines at the facility.

In 2011 Coppenrath & Wiese introduced the dessert cup to help the company produce an assortment of sweet bakery products and bread rolls. The lids of transparent plastic cups for the desserts needed be placed automatically – a difficult task since the lid covers were not flat, but had an unusual curved shape. It's no coincidence that the first robot was commissioned at Coppenrath & Wiese that year.

ABB's Delta robot IRB 360 FlexPicker fit the company's plans perfectly.

"ABB has become our robot supplier for several reasons," says Dietmar Lehmkuhl, who, together with colleagues, manages the equipment at Coppenrath & Wiese. "The robot can be cleaned very easily; several other manufacturers could not meet this important criterion. The decision to go with ABB was also made because there is only need for one controller to manage the robots."

In 2012, the engineering department at Coppenrath & Wiese integrated fifteen more flex pickers onto several production lines. The technicians were provided with the necessary knowledge about robot technology and programming both



Robot benefits

- High speed flexibility
- High capacity – up to an 8 kilogram payload
- Hygienic design for wash-down applications
- Superior tracking performance
- Integrated vision software
- Integrated control of indexing belts



in training and by exchanges with ABB experts. Deeper questions were handled from both sides during coaching sessions.

On its most recent production line, which went into operation in mid-2013, the company chose four IRB 360 robots for packaging and two 6-axis IRB 4600s for conversion boxes. This line has two products, including the new pastry "Sweet Spell." Each package contains six small sweets with cream topping and fruity filling.

The individually quick frozen (IQF) products are transported into the packing facility and every tray with 24 sweets is collected. On a conveyor line, four successively arranged IRB 360s go over them with their multiple grippers, continuously moving six pastries at a time to their packaging.

The robots work with ABB's Pickmaster software for the simpler programming multi-robot applications. Another useful program that was used during implementation was RobotStudio, ABB's simulation program. ABB technicians were able to simulate, in advance, the ideal location and working height of the robot as well as the cycle times, and found that the IRB 4600 was a perfect fit for this task.

"I appreciate the highly motivated employees at ABB, and the short distances to their location," says Lehmkuhl. "For us it is always possible to drive to ABB Friedberg to look at and test the equipment onsite. With a foreign robot manufacturer that would have been difficult."

One of four ABB IRB 360 robots packaging frozen dessert products.

Coppenrath & Wiese

Cakes, tarts, creamy pastries and other sweet treats are Coppenrath & Wiese's specialty. Europe's largest producer of frozen desserts has been in business since the early 1970s when businessman Aloys Coppenrath and his cousin, confectioner Josef Wiese, joined forces on a revolutionary idea to freeze their products directly after baking them. This ensures that the baked goods remain fresh until they are ready to be eaten.

Based in Northern Germany, the company has since expanded with a number of branches and distribution centres throughout Europe and the United States.

Size matters

ABB robots are at the heart of Australia's largest food palletizing solution.

Text: Charles Newbery **Photos:** Eduardo Gil



George Weston Foods (GWF) is one of Australia and New Zealand's largest food manufacturers, employing around 8,000 people at nearly 60 sites. The new GWF production facility in Castlemaine, Victoria, is now home to Australia's largest robotic palletizing system, featuring 16 ABB palletizing robots.

The GWF Castlemaine operation produces a wide range of small goods which are supplied to consumers through the retail food service and small distributor networks. The factory is divided into four key plants: ham, bacon, salami and continental small goods. Each of these production areas is serviced by a shared palletizer and distribution service.

Sixteen ABB robots serve 32 packaging lines at GWF Castlemaine, making it the biggest robotic palletizing system in the country. The palletizing line collects over 450 different products at the rate of about 9,000 cartons per hour, coming from four different packing areas. Some 27 lines and more than a kilometer of conveyor bring products into the palletizing cell, which has 16 ABB robots serving 32 pallet stations, and another robot at the front of the station preparing the pallets. Finally, two rail systems with four shuttles deposit the finished pallets at two stretch wrapper stations, which wrap more than 100 loaded pallets an hour and feed them to the automated guided vehicles (AGVs).

"Before implementing the robots the problems we experienced were from manual handling, including occupational, health and safety (OHS) issues, downtime, not getting the products out fast enough, and labor costs," says GWF packaging team leader Troy Thomas. "I think the defining factor was knowing that we could eliminate a lot of manual handling and remove a fair bit of the labor costs associated with the manual handling."

Kim Martin, GWF's supply chain manager agrees: "We had challenges with retailers in terms of making sure the consistency and quality of the pallets were what they required for their automated



networks. And like everyone else, we also had increasing labor costs and concerns about our ability to reach the productivity targets we needed in order to remain competitive.”

The market trend is towards smaller, more shelf-ready pack sizes. “Obviously that increases the repetitiveness of the tasks the team here needed to do, therefore increasing our OHS risk as well, which is probably the main risk that we have on site,” says Martin.

He also reveals that the company upgraded its ability to manage production speed and volume at its central distribution space, and that the installation also brought improvements to worker safety.

“Other improvements include significantly reduced levels of pallet rejections from customers, and the ability to deal smoothly with the production volume now being processed out of this site as each of the facilities has come online,” says Martin. “We have also seen a huge improvement in OHS injuries associated with palletizing, because we have largely eliminated that task.”

Melbourne-based Andrew Donald Design Engineering (ADDE) designed and installed the system for GWF. Bar-

George Weston Foods’ palletizing line collects over 450 different products at the rate of about 9,000 cartons per hour.

ry Hendy, ADDE General Manager, knew that ABB robots were a perfect fit for the food producer: “We chose ABB’s IRB 4600 robot because the orientation and positioning of the cartons needed a sixth axis, so we needed the extra dexterity of a six-axis robot to ensure the stations would be able to handle all of the palletizing tasks coming in from the conveyors.”

Line configuration was chosen based on the speed of the individual lines. Each automated row is able to look after two lines and maintain the rates on those two lines, which dictates the line configuration of 16 robots, serving the 32 pallet stations.

Scan the QR-code (right) to see the solution: Palletizing Cartons.



George Weston Foods

George Weston Foods Limited (GWF) is one of Australia and New Zealand’s largest food manufacturers. The production facility in Castlemaine Victoria is home to Australia’s largest robotic palletizing system, featuring 16 palletizing robots.



Improving uptime without costing the earth.



ABB provides products, systems and services that increase industrial productivity and energy efficiency for a wide range of picking, packing or palletizing applications. Our robots, drives and servo motors provide a high level of hygienic, flexible and reliable automation in these labour-intensive application areas. ABB's automation can really be the key to improving uptime, product quality and workplace safety, whilst reducing energy consumption and waste.

For more information visit www.abb.com/robotics