# ROBOTICS

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> After a record year in 2005, robot installations for 2006 were slightly down, but the forecast for 2007 is a growth of 10 percent according to projections from the International Federation of Robotics (IFR). And for 2008 and 2009, the projections continue to show a steady upward climb of 4 percent. So the future is looking good for robotics.

Former IFR president Mike Wilson says in an interview on page 3 that what's driving growth depends on the region. In Europe, it's efficiency, health and safety and energy savings that are driving forces, whereas in the U.S. and Japan, productivity and cost are major factors. In countries with low labor costs - China and India, for example – quality drives the investment in robots, which can ensure a consistently high product and process quality. One thing is certain, in a global marketplace every manufacturer – whether in Japan, the U.S., India, China, or Vietnam – needs to produce products of a world-class quality in order to survive. Robots can help create that quality.

In a recent survey, the IFR identified 10 good reasons for investing in robots, and we have based this magazine around these reasons, with real-life case studies from companies and integrators who exemplify each one of the reasons. They range from reducing operating costs, improving product quality and consistency, as well as the quality of work for employees, to increasing production output rates, product manufacturing flexibility and reducing material waste and increasing yield.

I hope that no matter what industry you are working in, you will find ideas and a rationale for how robots can make a positive difference in both competitiveness and bottom line profitability for your company.

Happy reading!

**Anders Jonsson**
Head of Division - ABB Robotics
Member of the Group Executive Committee ABB Ltd

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# Future prognosis: Strong growth

Mike Wilson, President of the British Automation and Robotics Association, has been in the robot business for 25 years. He's seen it all when it comes to robots, working with companies such as ABB, Fanuc and Motoman. *Robotics* talks with Wilson on the future of robotics and the driving forces behind the industry.

Photos Jørn Tomter

**> How do you see growth in the robot business?**
The trends show continued strong growth. However, installations for 2006 were down from installations in 2005. Although we should keep in mind that 2005 was a record year, and that 2006 was actually the second highest on record. The estimated stock of robots in operation has actually exceeded 1 million for the first time.

**How do sales compare across the globe?**
Both in Asia and the Americas, the numbers have been down after a record year in 2005. The situation in Europe is reversed with a big increase following a small drop in 2005.

It is interesting to note that despite the numbers, significant growth is still demonstrated in China, South America and India. This is being driven by investments in automotive plants in these areas despite the overall drop in automotive robot installations worldwide.

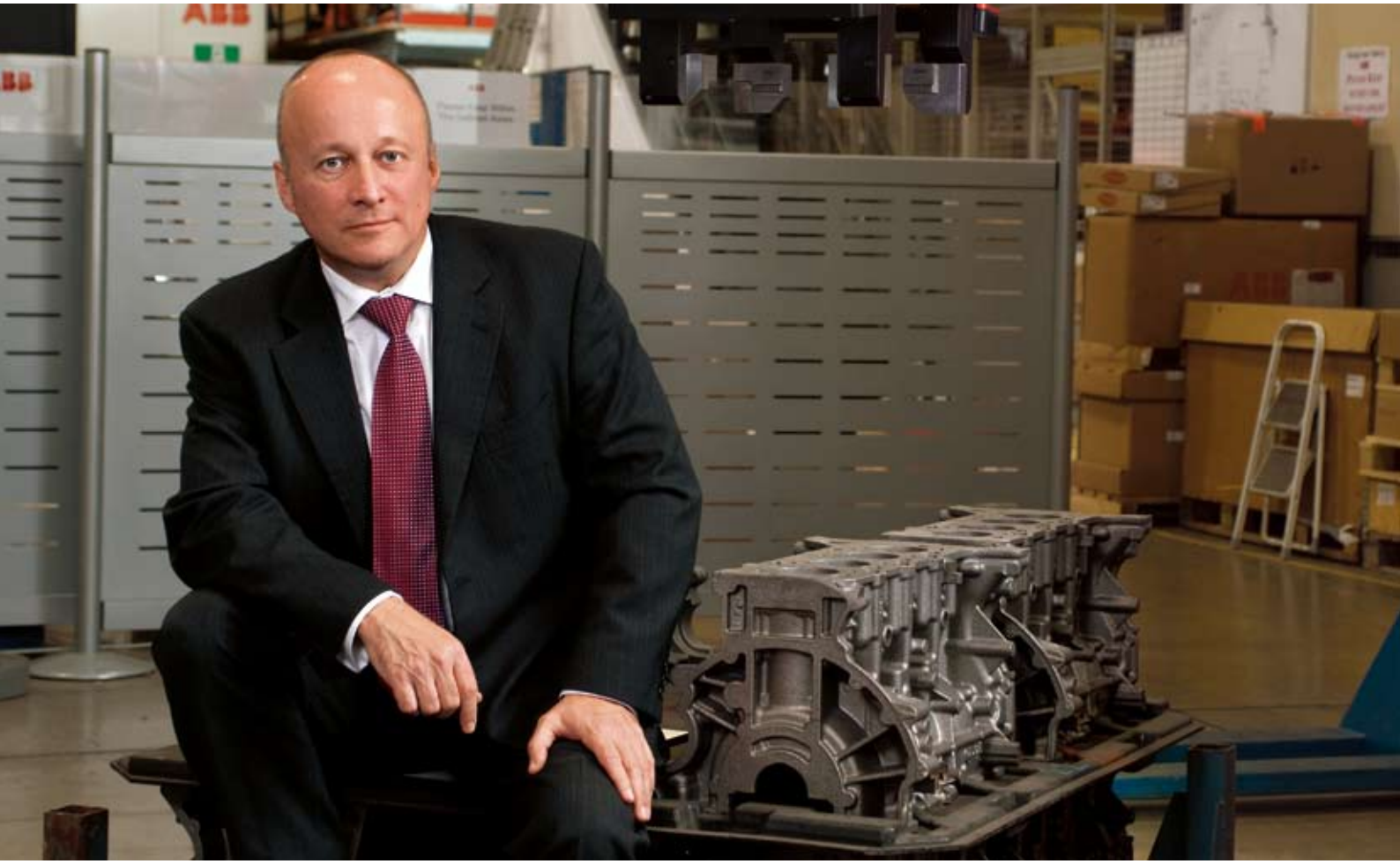
**Is the transfer of production from high-cost to low-cost economies having an impact on robot sales?**
Many companies are now finding that the longer supply line and difficulties in dealing so far from home make off-shore production less attractive. So they are looking at robotics to reduce the cost of manufacturing at home. This is particularly true in the United States. In Europe the situation is slightly different in that many companies have outsourced production to the lower-cost countries of Eastern Europe. However, in many cases they are looking to automate in these countries as well.

**There must be different rationales for investing in robotics in the different areas then?**
There are various potential justifications for the use of robots, and the significance of these will change under the different economic conditions found in each country.

In Europe the efficient use of resources, including energy, space and labor, together with ensuring the health and safety of the work force, are often the key parameters. Whereas in the United States, it is often cost and productivity that drives investment. In Japan, it is also productivity driving investment, but in countries with lower labor costs, such as China, it is very definitely quality that is the driver, where automation ensures consistency, reduces waste and improves process control.

Of course, the drivers are varied even within regions and countries, from industry to industry, and from company to company. (To get a more complete view, look at the story on page 5 "10 good reasons to invest in robots.")

**We know that the automotive industry has always been a major user, but are there major new sectors appearing?**
The automotive industry is still the biggest user of robots, although the electronics industry, particularly >



in Asia, has always been very important. In fact, both these sectors reduced robot sales significantly in 2006: 17 percent and 34 percent respectively, whereas the other sectors grew by 25 percent. In particular, robot sales to the metal products industries, chemical, food and plastics industries achieved significant growth.

**What are the challenges for robot companies in addressing these new markets?**

Food and aerospace are two sectors that have significant potential. However, the users have different requirements, cultures and languages in comparison to the automotive industry. The robotics industry has needed to learn to listen and understand the specific needs of these new customers rather than sell them existing solutions developed for the robotics industry's traditional customers. This process is underway and as a consequence, we should expect to see a significant growth in robot applications in these new sectors.

Additionally, there are small companies where there is only the opportunity for a few robot sales. Robot companies have often ignored these to focus on the larger numbers available from the automotive industry. However, the potential available for robot sales in the smaller companies overall is larger than that from the automotive industry. Robot companies will need to learn how to address the specific needs of these small companies, such as limited in-house expertise and tough financial constraints. But once they do address such needs, there is a large market available.

**There seems to be a growing second-hand market. Will this affect robot sales?**

Some robot suppliers are concerned that the growth of the second-hand market will be detrimental to robot sales. However, the availability of lower-cost machines opens up applications and installations at companies that otherwise would not have considered using robots. These companies will gain the benefits of robotic automation and will apply new machines in the future.

Additionally a buoyant second-hand market will ensure residual value for old units and therefore provide money for re-investment for those companies who wish to remain at the forefront of technology by buying new.

**What role do system integrators play?**

At the end of the day, a robot is only a tool. It is as good as the system which is built around it. System integrators are therefore very important to the growth of robot sales. To be successful and provide good systems, they need to understand the process and application, understand the customers' requirements and deliver solutions which meet those requirements using appropriate equipment. This is often not the lowest-cost solution and customers need to recognize that cheapest is often not the best. The user needs a system that produces what is required not just on the day it is bought but over the period of life of the system. The reliability of all the

>FACTS

### Mike Wilson at a glance

- President, British Automation and Robotics Association
- Chairman of the International Federation of Robots in 2000-2003
- Owner and Managing Director, Creative Automation Solutions Ltd
- Has served as Managing Director at HY Robotics, Meta Vision Systems, FANUC Robotics UK
- MSc in Industrial Robot Systems, Cranfield University; BSc in Engineering Science, University of Warwick
- Family includes partner, Elena, and two children from a previous marriage
- Currently reading *The End of Poverty* by Jeffrey Sacks
- Favorite quote: "All animals are equal, but some animals are more equal than others"
- Manchester United fan

equipment, not just the robot, is very important and the good system integrator delivers productive, reliable systems.

**What is the potential for the future?**

Don't expect an explosion in sales. There is still significant potential, particularly if the same usage as has been achieved in automotive can be achieved in other sectors. However, the constraint is the ability of robot suppliers and system integrators to deliver the solutions. Therefore the growth will be strong and steady. The industry is forecasting that the results for 2007 will be a growth of about 10 percent, and for the following years about 4 percent growth is expected each year.

The capability of robots will continue to be enhanced. The greater use of vision and force sensing will continue to open up new applications.

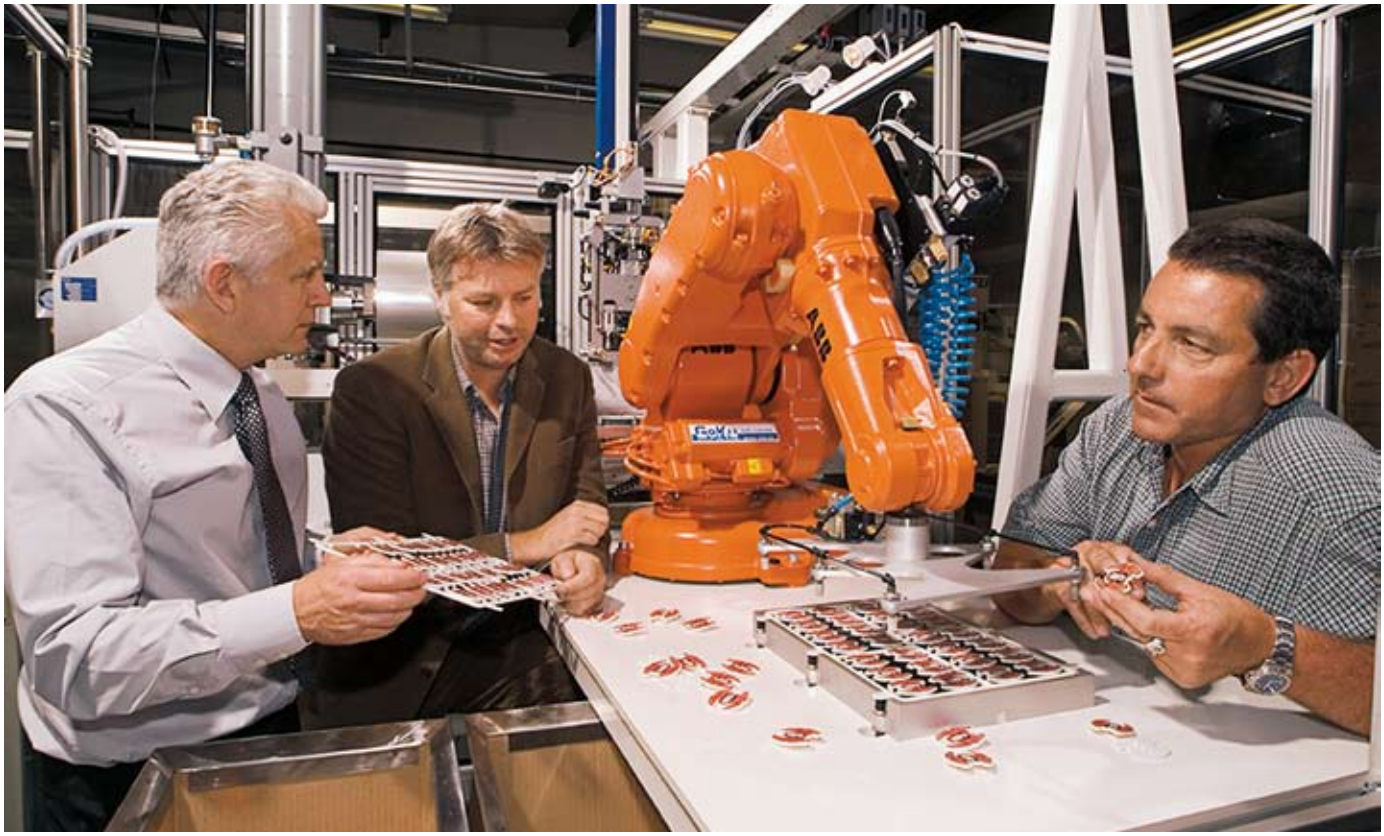
The development of the service robot market will greatly increase the production of robotic technologies. This will produce gradual changes in volume, which will provide some enabling technologies such as vision to the industrial market at prices where they become standard rather an expensive option.

The service robot sector will also develop technologies and capabilities to allow robots to safely interact with people. These same capabilities will be available in the industrial market, which will reduce the requirements and costs associated with safety, making robots a much easier and cheaper solution.

## 10 good reasons to invest in robots

The International Federation of Robots recently outlined a number of key reasons why it's worth investing in robotic automation. Mike Wilson has expanded on these points to show how robotics can benefit businesses. Here are 10 of the most common benefits for using robots in production:

1. **Reduce operating costs** – Robots can reduce both direct costs and overheads, making a dramatic difference to competitiveness.
2. **Improve product quality and consistency** – Robots produce a consistently high quality of finished materials, since there is no risk of tiredness, distraction or other effects from manually performing tedious and repetitive tasks.
3. **Improve quality of work for employees** – Employees no longer have to work in hot, dusty or hazardous environments, plus they can learn valuable programming skills and be freed up for other work.
4. **Increase production output rates** – Robots can be left running overnight and during weekends with little supervision, so output levels can increase and order deadlines be more easily met.
5. **Increase product manufacturing flexibility** – Robots can provide flexibility to a production line. Once processes are programmed into the robot controller, the robot can easily switch from process to process.
6. **Reduce material waste and increase yield** – Robots can achieve high-quality finishes from the start, and waste due to poor-quality or inconsistent finishing can be significantly reduced.
7. **Comply with safety rules and improve workplace health and safety** – Robots can take over unpleasant, arduous or health-threatening tasks, decreasing the likelihood of accidents caused by employee contact with potentially hazardous machines or processes.
8. **Reduce labor turnover and difficulty of recruiting workers** – With highly skilled manual workers becoming harder and more expensive to employ, robots can provide an ideal alternative.
9. **Reduce capital costs (inventory, work in progress)** – Robots can help reduce the cost of consumables used and reduce waste, plus with less manual labor, there will be fewer costs related to sickness, accidents and insurance.
10. **Save space in high-value manufacturing areas** – Robots can be placed on shelf systems, on walls or even on ceilings. They can also be programmed to work in confined spaces, saving valuable floor space.



Production is up 100 percent at Characteristix, thanks to automation.

# Big changes for small objects

**Robots turn around the production at plastic figure maker Characteristix, helping increase production by 100 percent and more than meeting a goal of reducing costs by 5 percent.**

By Chris Miles
Photos Characteristix

> If you live in the United Kingdom or Europe, chances are high that you own a product from Characteristix. The company, based in Cornwall, produces a wide range of plastic moulded objects, everything from birthday badges, stand-up figures, pendants, figurines, pencil toppers to fridge magnets and plastic paper clips, among other things, moulded in the unmistakable shapes
of famous cartoon characters such as Bob the Builder, Spiderman and Shrek 2, for example.

Characteristix, which has a prestigious list of license partners such as 20th Century Fox, BBC Worldwide, Disney, Universal Studios and Warner Bros., has exploited a niche in the market to supply quick turn-round, small-to-medium batch products to U.K.– and European-based customers – companies which would have previously sourced their requirements from Asia.

The emergence of Characteristix gives its customers considerable flexibility in that they don't have to hold costly stock and can order relatively small batches, which are subsequently manufactured and delivered on a "fast-track" basis. This compares favorably with supplies from China, for example, where customers are restricted to ordering extremely large batches, can expect three-month lead times, and need to closely examine quality and product suitability before proceeding. An additional advantage of using Characteristix is that the company can offer a total turnkey approach, which includes design and artwork.

Characteristix, part of Gemma International Group, was formed in 1997 with Andy Knight heading the company. Production was centered around two 70 metric-ton, 1980s-vintage Arberg plastic injection moulding machines. After being dogged by problems that couldn't be serviced, the machines were

>FACTS

**The GeKu manufacturing cell includes:**

- An ABB 6-axis IRB 140 robot
- Krauss Maffei injection moulding machine
- GeKu beam robot, conveyors, pneumatic printing press
- **Web site:** www.geku.co.uk


A 6-axis IRB 140 robot mans the injection moulding.

**Automation pluses**

**Benefits of the new automated cell:**

- Huge decrease in downtime
- Performance up more than 100 percent
- 33,000 pieces produced per day
- Employees newly motivated

finally replaced after a month in which there were 160 hours of downtime.

Knight's problems were not just through unserviceable problems however. Another headache was his customers' requirements for ongoing reductions in piece part prices – 5 percent per year.

Two Kraus Maffei machines were sourced and purchased as replacements in late 2002 and early 2003. These immediately brought about 30 percent savings on set-up and operating time, and have proved to be extremely clean and virtually fault-free in operation. Pay-back from this was used, in part, for capital repayments on the machines, with the rest being passed on to customers in the form of reduced prices.

The requirement to reduce costs by 5 percent a year was unremitting, however, and Knight had to go to the Manufacturing Advisory Service (MAS), part of the DTI, on how to further improve manufacturing efficiency and reduce costs.

Assessing the company's requirements, the MAS suggested that Characteristix automate at least part of its production, and this led to the company teaming up with ABB partner GeKu, after a product demonstration at the Interplas exhibition in 2002.

Says Andy Knight: "What was interesting about GeKu was its expertise in automated plastic injection moulding techniques and at the exhibition we saw them manufacture a key ring with a printed insert, a product we could readily identify with. Nigel Richardson, Joint Managing Director of GeKu, then arranged a visit to the ABB Customer Center at Milton Keynes for us to witness a demonstration of the IRB 140 robot. This was suitably impressive with its compactness, accuracy and efficency, for us then to go ahead with a project of our own."

The new cell, which was designed, installed and commissioned by GeKu, produces 33,000 pieces a day, including the birthday card badges, of which it provides 10 million pieces per year for parent company Gemma International alone. Manufacturing performance has improved by over 100 percent.

The cell operating cycle starts with the GeKu beam robot de-moulding the runner from the Kraus Maffei injection moulder and placing it in the print fixture. A picture transfer is placed on the print fixture, and the transfer image printed under a pneumatic press. The IRB 140 robot takes the moulding out of the print fixture and places it in a holding fixture. The robot's wrist then rotates to expose a cutting tool, which snips the pieces from the runner – removing 30 pieces in about 18–20 seconds.

Not only has the cell ramped up production for the Cornish badge maker, but it has brought interest and variety to many of the production work force. "Many of our staff who were previously employed on manual labor tasks have risen to the challenge of robot-based manufacturing, readily participating in robot programming and operator tuition to enhance their skills," says Knight.

"…the GeKu-designed cell and its ABB robot have helped us to be ultra-competitive."

**Andy Knight, Characteristix**

"An SME enterprise, based in rural Cornwall with 11 employees may not seem like the most likely of companies to install robots and take on the Far East at its own game," says Knight. "However, the GeKu-designed cell and its ABB robot have helped us to be ultra-competitive, while we have maintained and indeed expanded a client-base made-up of some of the most recognized names in the world. I am so impressed with the cell that we will install a second by the end of the year and full 'lights-out' operation will follow that."


# Flexible production to meet customer needs

**Keeping ahead of the global competition in the metalworking industry means improving the quality and consistency of products. ABB robot systems have helped Portuguese manufacturer Farame rise to both challenges.**

By Peter Wise
Photos Raquel Wise

> "The key competitive factor in our industry is product differentiation," says Pedro Sousa Pires, general manager of Farame, a Portuguese producer of steel carts and trolleys. "We need to be innovative in design and flexible in production."

Based near Lisbon, Farame has been in business since 1983. Its main products include handling and storage trolleys for letters and parcels in post office distribution centers and for components in automobile plants, as well as supermarket carts and related products.

The company, which was acquired in 2000 by Caddie of France, the world's second largest producer of supermarket carts, uses only ABB robots, positioners and welding cells in its production line, which involves cutting, bending and welding steel wire, rods and tubes into products that are then zinc-coated and painted.

Farame, which has annual sales of about 15 million euros (USD 19.2 million), began using ABB robot systems in 1992, when it purchased an IRB 6000 M92 model spot welding station with two operator areas and a resistance press for welding supermarket carts. It has since purchased eight additional ABB systems, including six IRB 1400 robots. In January 2006, it installed an IRB 1400 M2000 model with an IRBP250R positioner and an Arcitec arc welding machine. In November, the company received a FlexArc Cell, a new approach by ABB involving an IRB 1600 M2004 model with an IRBP250R positioner, a Fronius TPS4000 arc welding machine and a complete safety system, all situated in a compact, transportable monobloc welding cell. All components are pre-tested, and the cell is ready to start work on delivery day.

**Farame produces** between 300 and 400 different products each year and at any one time is simultaneously manufacturing between 20 and 30 separate products. Letter and parcel handling trolleys for La

"In a very short time, after a few small adjustments, we're ready to begin producing an entirely different item."

**Pedro Sousa Pires, Farame's general manager**

Poste, the French Post Office, are currently the company's leading product, and it has just won a contract for a similar product for the Swiss Post Office. This wide range of different products made in small series – a big series for Farame is never more than 1,000 units – requires flexible manufacturing processes and rapid adaptations in production lines.

"We can quickly call up the program for a different product and in a very short time, after a few small adjustments, we're ready to begin producing an entirely different item," says Sousa Pires. "This helps maximize our flexibility."

The adaptability of standard ABB robot systems is another import asset for Farame. "We install standard ABB systems because this gives us the advantage of common parts and common programs," says Sousa Pires. "It also means that all our programming and operating staff can use all our welding stations. At the same time, because standard ABB systems are so flexible, each robot can be quickly adapted to a new or different product."

ABB robots have also freed Farame from dependence on subcontractors and the vulnerability due to poor quality and late delivery times that that entailed. Products can now be relied on to be of a high quality, and just as important, a consistent high quality.

"The improved productivity and enhanced manufacturing we have achieved by installing robots means we no longer have to rely on subcontractors at periods of peak demand," says Sousa Pires.

**>FACTS**

### Benefits for Farame with automated welding

- Quality and consistency of product are ensured
- All programming and operating staff can use all the welding stations
- Each robot can be quickly adapted to a new or different product
- More available time and manpower for developing new products
- **Web site:** www.farame.pt

# More shells, better

**U.S.-based Franklin Bronze turned to automation to answer its needs for more capacity and volume from its investment casting. The results have been not just greater efficiency, but a safer and cleaner work environment for employees.**

By Niki Kapsambelis
Photos Gene Puskar

> Franklin Bronze and Alloy, Inc. is located in northwestern Pennsylvania in the United States. Founded in 1878, it is among the oldest continually operating facilities of its kind in Pennsylvania. But there is nothing old-fashioned about its state-of-the-art shelling system that was installed in 2005 by Shell-O-Matic Inc. of Montreal, Canada, a longtime partner that supplies the investment casting industry with both stand-alone equipment and totally integrated systems.

The centerpiece of the system is ABB's IRB 6600 robot, which has exponentially increased the foundry's capacity while simultaneously improving the uniformity of the shells it creates.

The investment casting facility produces ceramic shells to create parts for a multitude of industries ranging from automobiles to door hardware and industrial valves. Among its biggest product lines is a part that is used in conjunction with molds for creating glass bottles.

**Shells begin with** wax patterns, which are injected to a high tolerance, measured down to 1/500th of an inch. Up to seven coatings, including colloidal slurry and a thin layer of sand, are applied to the shells before they are hung on industrial-sized racks to dry for pre-specified amounts of time.

When done by hand, the dipping process can be both fatiguing and cumbersome. Six employees produce about 100 moulds each day, standing for long hours over a vat of slurry or sand, allowing the coatings to drip off before hanging them on a rack.

"To remain competitive in the industry, we needed more capacity, more volume," says Franklin Bronze President Robert Barber.

In July 2005, Shell-O-Matic, installed a complete shelling system, including the robot, slurry tanks,

>FACTS

**Benefits for Franklin Bronze of Shell-O-Matic's automated shelling system with IRB 6600 robot from ABB include:**

- Cleaner environment for workers, plus less physical stress
- Man hours reduced from 56 per day to 32 per day
- Increase in production of molds from 140 to 200 per day
- Improved quality of shells due to uniform dipping
- ROI of 2.5 years

**At a Glance: Shell-O-Matic Inc.**

- Founded: 1978
- Location: Montreal, Quebec
- Production details: Designs and manufactures specialized equipment for wax pattern and ceramic shell production in the investment casting industry
- Web site: www.shellomatic.com

**At a Glance: Franklin Bronze and Alloy Inc.**

- Founded: 1878
- Location: Franklin, Pennsylvania
- Number of employees: 100 total, 85 in the investment casting plant
- Production details: Manufactures precision castings in brass, bronze, aluminum, stainless steel and nickel-based
- Web site: www.franklinbronze.com

# workplace

fluidized beds, and a rainfall sander with automatic sand feeding. Four compact conveyors are used to dry the moulds from the first to last coats.

A supervisory computer with a barcode reader tracks parts as workers load them onto the conveyor. The computer determines which dipping program the robot will follow for a certain part. Once dipped, the mould is then routed through the drying process by the computer. The robot lifts the hanger to which the moulds are attached and steers it through the room's controlled climate according to the parts' drying schedule. As a finished mould exits the system, a report is automatically printed out with the manufacturing details for that shell. Workers manually unload the finished pieces from the conveyor.

Under the new system, three workers make approximately 200 moulds every day, compared to the six workers who produce half that amount in a section of the foundry that still dips by hand. Prior to the installation of the new robotic system, Franklin Bronze's maximum capacity was 140 moulds daily using nine workers. Today, their maximum capacity is up to 400 moulds per day with six people, though they have yet to reach that point. Man hours have been reduced from 56 hours a day to 32.

"We're increasing our moulds per day by 30 to 40 percent with the same amount of people, and there is still a lot of capacity left," says Barber.

In addition to the increased production, the quality of the shells is better, because the machine dips them the same way every time. The Shell-O-Matic system can also hang more shells up to dry – up to 250 pounds – a factor contributing to the increased capacity.

**Workers appreciate** the impact the shelling system has had on improving their quality of life in the workplace. Not only is the environment cleaner, but the job is also less physically fatiguing.

"It's much easier for the workers to use the robotic system," says Kevin Weaver, who manages the system for Franklin Bronze.

Today, employees have a less-hectic workday. The tasks are easier, and the job is generally less stressful.

An IRB 5400 robot spraypaints the backs of rear parcel shelf brake light housings at D&M.

# From humble start

**From its origins painting jet skis, D&M in Melbourne, Australia, has transformed itself into a cutting-edge industrial supplier to the automotivge industry and robots have helped increase production to achieve volumes expected by the big automakers.**

By Garry Fabian
Photos David Callow

> Australians Darren King and Michael Von Dort realized some eight years ago that the use of robots was the way ahead if they were to be successful in the very competitive and specialized field of industrial spray painting.

Van Dort, a panel beater, and King, a spray painter, worked alongside each other in a suburban Melbourne car repair shop some 20 years ago. That was when they decided to start their own business. D&M Auto Industrial Spray Painting Pty. Ltd. initially was a very modest operation, based in their garage, with very basic technology. Their first drying tunnel was a 200-liter drum and a domestic electric fan.

As their commitment to excellence and customer service pulled in more and more customers, the pair took their fledgling business to larger, better-equipped premises. To make best use of the new space, they decided to specialize in repairing and painting jet skis.

"The notion of robotic spray painting at that time was as fanciful as flying to the moon," King says.

With the growth of the business, their vision became focused on industrial spray painting, centering on production-line concepts. One of their first contracts was to paint ugly PVC pipes used in supermarkets to transport cash from the checkout to the

The brake light housings gleam after painting.


Michael Von Dort, co-founder of D&M.

# to high-tech result

office. While this may have been mundane, it firmly established their uncompromising emphasis on quality control, repeatability and value for money for the customer.

**Today the company** has 20 employees and five robots, with two additional robots due to arrive shortly. Some 90 percent of their work is for the automotive industry, specializing in painting small component parts. Their customer base includes most of the leading manufacturers, both local and international. Other work includes painting train doors and components for bio-medical equipment.

The first robotic line was installed in 1998, just 10 years after the pair opened their doors for business in the garage. There were some initial problems, but with persistence, the demonstrable benefits of using robots became evident.

The D&M robotic production line handles consecutive operations that progress through several >

>FACTS

**Why automate painting?**

The benefits for D&M in using robots for paint applications are many:

- Productivity and profitability boosted by 80 percent
- Consumption of paint reduced by 30 to 35 percent.
- Data collection and storage achieved via a production log on every item handled, allowing for the replication of processes even years after they were last used
- Flexibility increased, allowing for very low-volume runs and job changes every few minutes if necessary
- Number of accidents and work-related illnesses reduced
- **Web site:** www.dandmspraypainting.com.au

"The benefit of using robots is the ability to have low-volume runs, as well as to change jobs every few minutes to cater to any application and suit practically any size and shape."

Darren King, D&M

> stages, from cleaning, inspection and priming through four or five paint applications, seamlessly.

Currently there are three IRB 5400 spray paint robots in operation, equipped with spray paint guns, and within a few months, two new, enhanced IRB 5400 robots will be installed. One "slim arm" robot for ice application and one "process arm" (integrated pneumatic component onboard) robot to allow spray painting of two components. The IRB 5400 Process Arm robot incorporates the latest ABB Pattern Control Bell (Robobel 951) developed by ABB Japan, which reduces paint waste considerably. Olivier Coquerel, ABB robotics account manager in Australia, describes this package as the latest state-of-the art robot.

King explains that, for D&M, this new ABB technology bell could reduce the consumption of paint by 30 to 35 percent, compared with traditional spraying guns. "This reduces waste, giving us a competitive edge," he says. "The other benefit of using robots is the ability to have low-volume runs, as well as to change jobs every few minutes to cater to any application and to suit practically any size and shape. We are extremely flexible in the type of part we can handle. You could say that 'small is beautiful.'"

Why did D&M select ABB robots? Van Dort says that quality, flexibility, reliability and back-up service were major considerations. Day-to-day maintenance is carried out in-house by D&M staff. Another aspect of the robotic operation of the plant is the impact on the health and safety of employees, reducing accidents and work-related illness.

**The robotic lines** operate 12-hour shifts every day, King says, and have boosted productivity and profitability by 80 percent. He recalls one employee asking why the line didn't stop for lunch. The reply was: "Because the robots aren't hungry."

Linked to the production line at D&M are other innovative concepts, including a production log that records programs, cycle times, paint type and other relevant data of every item handled, giving a total history over a three-year period.

"Traceability is vital in being able to replicate repeat processes for any item on a recurring basis," King says. "Coupled with the ability of a robot to carry out repeatable operations consistently, we can rapidly program our production, cutting out the 'human error' factor. In fact, yesterday's spray painter has become today's operator; the robot carries out the actual painting process."

D&M's commitment to high quality was recently recognized, when the company won the Melbourne Business Award for Innovation and Excellence in March 2006. The award is valued throughout the industry. "We take ownership of the part we are processing, with quality and consistency in our process being the No. 1 factor," Van Dort says.

>FACTS

### The robots

At D&M, there are three ABB robots in operation, with two more on the way:

- Three IRB 5400 spray paint robots equipped with spray paint guns
- Coming soon: two new, enhanced IRB 5400 robots – one "slim arm" robot and one "process arm" (integrated pneumatic component onboard) robot with an ABB Pattern Control Bell (Robobel 951) developed by ABB Japan

By Holger Walch
Photos Trio Group

# Salami under control

**High-speed robots with specially developed grippers package irregularly shaped sausages in six varieties and multiple product packages with maximum flexibility and cost-savings at Schafft/Unilever's plant in Ansbach, Germany.**

> Since 1972, Bifi salami has been a mainstay in the German snack market. A product of Unilever, Bifi salamis had long been manufactured in the Bavarian town of Anspach, with certain aspects of the production done manually, such as insertion of the salamis in the rollstock machine manually. Then in 2006, the company made the switch to an automated solution with IRB 340 FlexPicker robots from ABB using gripper technology to take the six different sausage types from the conveyor belt and insert them in a rollstock machine.

Unilever commissioned robomotion GmbH from Stuttgart to plan and design the automation solution. The aim was to use a rollstock machine to its maximum capacity with the specified dimensions. The automation solution had to be ultra flexible so that six different products could be packed with one system and so it could be retrofitted for future products.

**Robomotion's task** was made more difficult because the customer placed stringent requirements on the precision and reliability of the insertion process – not to mention major deviations between the products. By planning and processing the project in partnership, it was possible to install and commission the entire system at Unilever within 10 days.

The mechanical gripping technology helped to increase the process reliability sharply, thus raising the production volume per robot. Increasing the speed of the handling process also increases the risk of product loss. This is where the positive fit principle of mechanical grippers comes into its own.

Not only can the physical loads lead to a high level of material loss, but also to a large number of empty lifts. Subsequent processes are also affected, for instance when packages are heat-sealed empty and have to be separated at the end of the process, or when packaging machines fail because the objects fall uncontrolled into the machine, causing disruptions and stoppages.

The mechanical grippers offer benefits over other technology because the positive-fit grip makes it almost impossible to drop the item, even at maximum accelerations and speeds. Picking and placing is carried out with great precision.

**Unilever wanted to increase** the packaging machine's production and therefore turned to robomotion in the summer of 2005. This specialist in high-speed handling for hygiene-critical areas determined which streamlining measures could be used and >


ABB
robo

Using IRB 340 FlexPickers with specially designed grippers From Schunk, Bifi salami is picked more efficiently and with less waste.

Unilever chief engineer Carim Gad, left, with the team from robomotion and ABB.

By running the packaging machine at full capacity, Unilever has been able to increase performance by up to 25 percent.

> how process reliability using mechanical grippers could be improved compared with previous technology.

Says Unilever project manager Torsten Rütze: "We were convinced by robomotion's technology. Thanks to the performance data produced there was no problem justifying the new investment. The tailored integration into our production environment saved us both time and money. The methodical approach and the safety procedures undertaken in each phase of the project reassured us that we had chosen the right supplier."

Working closely with Schunk, a firm specializing in gripper technology, the company first carried out a study and a pilot test in the laboratory. Robomotion demonstrated that the required cycle times could be achieved with a mechanical gripper solution while simultaneously increasing the process reliability. It was also possible to comply with the required food and hygiene regulations.

"As they were using tried and tested kinematics, the developers from robomotion and Schunk concentrated primarily on the process-oriented functional prototype, the drive and on optimizing the grippers," says Jörg Herrmann, who headed the project at Schunk on behalf of branch management. "Together we expanded on the original double gripper, adding a third gripper and a third lifting unit, and finally optimized the weight of the robot as a whole. This technology enabled us to come online in February 2006."

After working three shifts for six months, the principle developed had proven its capability. Thanks to the excellent planning, it was possible to cut back on one robot, thereby achieving an improved price/performance ratio for the system.

"With the new system, we're running the packaging machine at full capacity, giving us a performance increase of up to 25 percent compared with manual loading. The ability to cover peak loads is of particular interest. For example, in the run-up to the Football World Cup, special production shifts were operating at the weekend. This alone gave us a competitive edge, enabling us to deliver Bifis to our customers on schedule," says chief engineer Carim Gad.

**IRB 340 FlexPickers** operate at high speed on the Bifi packaging line. For the first time, the ABB production robots have been fitted with the triple gripper which is able to pick up three randomly positioned sausages one after the other from the conveyor belt in one process step, and place them individually in the rollstock machine. The positioning and location data required comes from an upstream image processing system which is in a position to capture the information relating to the individual sausages and pass it on to the master computer.

Jan Binder, technical director at robomotion, goes into detail about the further technical intricacies of the system. "The software we've developed enables an optimal supply of positioning data from the image processing to the robots, so the utilization ratio is planned optimally. Moreover, a system concept could be achieved which saves a lot of space and exhibits a high power density."

"This high-speed technology is not only of interest in the foodstuffs sector, as it can be used anywhere where small items have to be handled at high speeds, for example, in fast assembly and mounting processes," says Andreas Wolf, director of robomotion with responsibility for sales and preliminary development.

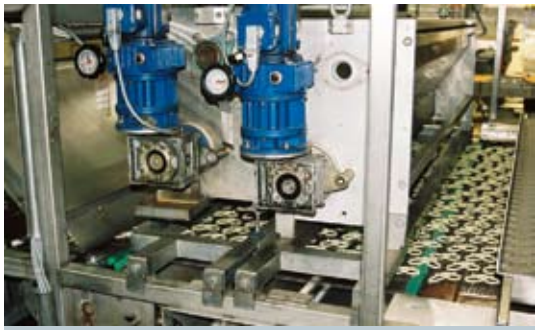
The high speeds open up new prospects for cost-effectiveness as the parts do not have to be prearranged or placed in magazine feeders, but can in effect be randomly placed on the conveyor belt, like bulk goods, and gripped there at high speed.

>FACTS

### Efficient and flexible system

The new picking system from robomotion uses IRB 340 FlexPickers with grippers developed by Schunk. The system used for picking and placing Uniliver Bifi salamis offers a range of benefits, including:

- Flexible system thanks to software, image processing, which allow for quick switching to picking parts with new dimensions
- Efficiency is so great, a robot was eliminated from the process
- No pre-arranging or pre-placing of the salamis prior to picking is necessary
- A 25 percent increase in production
- **Web sites:** www.schunk.de **and** www.robomotion.de



# Handled with care

**The latest innovation at Roland Murten AG is pretzels packed individually by robot. The number of broken items has been reduced from as much as 12 percent down to about 4 percent.**

>FACTS

**Roland Murten AG**
- Founded 1938
- Part of the Valora Group
- Some 140 employees
- The range of products includes items such as pretzels, bread sticks and Flûtes cookies
- Web site: www.roland.ch

**Advantages for automated pretzel packing include:**
- Breakage decreased from 10-12 percent down to 4 percent
- Better working environment for employees with much lower noise
- Total of 134 kg pretzels packed per hour

By Melanie Nyfeler
Photos Roland Murten

> What is small, brown, freckled like Pippi Longstocking, and very crispy? A Roland pretzel from Murten, of course. These days, Roland Pretzels are sold in Switzerland, Germany and elsewhere in specially moulded plastic containers that require careful packaging techniques.

Some six FlexPicker IRB 340 robots from ABB, thanks to specially developed mechanics, lift individual pretzels by their two loops and stack them in the container until it is full. All this takes place at high speed – 134 kilograms of pretzels have to be packed every hour, 24 hours a day.

Once the pretzels have been baked, the six ABB robots, set up diagonally opposite each other, go to work. Each has a camera focused on the conveyor belt, which transmits the coordinates of each individual pretzel to a computer. The computer programs the arm to lift each pretzel by its loops and lay it in a container. There are two challenges for this technology: first, the extraordinary precision of the picking, and, second, the calculation of the shortest distance.

The calculation is made by the PickMaster software program. The arm does not take the pretzels off the conveyor belt in the order in which they arrive, but instead, always takes the one nearest to it. It always needs to know how many pretzels have already been placed in each container. Once the container is full, it is tipped and wrapped in plastic foil.

One of the major advantages of the new FlexPicker IRB 340 is that many fewer pretzels are broken than previously, which is important for the productivity and profitability of the whole enterprise. Because there are fewer breakages, fewer people are needed to check the packaged pretzels and replace the broken ones by hand.

"Before we had to take two people off the other machines to do the quality control," says Fuchs. "Now everybody can carry on working at their normal station. We've been able to reduce the number of broken items from between 10 and 12 percent to about 4 percent. These robots can pick the pretzels up much more gently."

# Sitting safely

**With the help of robots used for packing, Swedish furniture manufacturer Svedplan has automated a once-hazardous operation, freeing up workers to do other less risky tasks.**

By Graeme Forster
Photo Pontus Johansson

> Swedish furniture manufacturer Svedplan has hit on a good way to stay ahead of the competition: a mix of strategic manufacturing and automated technology. The latest move is to introduce automated packaging, a development that will both smooth the production output and – important from a health and safety point of view – eliminate a tedious and potentially strenuous manual task from the production process.

The company manufactures some 50,000 flat-packed furniture units per week for one of the world's biggest furniture retailers. These are freighted directly from the factory to outlets and distribution centers around the world.

While simple robots had long been involved in loading and unloading production lines, together with automated processes for drilling holes, packaging the various components was still largely a slow, manual activity: Flat-packed beds and chests of drawers are heavy items and awkward to manhandle.

When Managing Director Preben Ritter took his post three years ago he had two main concerns: to improve processes as a way to maintain competitiveness with low-cost production sources and to reduce the risk to handlers in the packaging process. The solution was provided by Teamster AB, specialists in automated process technology.

**The Teamster** recommendation was to automate half of the manual packing line, creating three stations with a total of eight robots. Five IRB 4400 robots would be used to pack products into boxes. Three IRB 660 robots would feed the IRB 4400 robots parts directly from pallets.

Products are saved as recipes in the supervision system and therefore can be switched quickly and efficiently. New products can be introduced rapidly by entering pack size details into an Excel spread sheet along with details of the new packing position and station and then downloading this information to the central control system.

Ritter has noticed an improvement not just in the safer environment, but in the workers' attitudes toward automation in the workplace. "At first, people were extremely wary of this new technology," he explains. "Now they feel proud of it." Ritter assured the workers that, far from threatening their jobs, it was the only way of preserving employment in the face of global competition. There have been no job losses at the factory as a result.

Partly as a result of this new automation, throughput has increased by up to 45 percent per hour. The volume on the robot lines is 10 to 15 boxes per hour, compared with six to 10 boxes per hour on the remaining manual lines. At this rate, reckons Ritter, the company should realize return on investment in two to three years. And it will have the technology to survive in the highly competitive furniture industry.


>FACTS

### Robot pluses

- No more heavy lifting for employees
- Work conditions for employees have improved without loss of jobs
- Production increased by as much as 45 percent, with automated lines preparing 10 to 15 boxes per hour, compared with six to 10 boxes per hour on the manual lines
- Return on investment of two to three years

### Spotlight on: Teamster AB

- Specialists in industrial automation technology
- Based in Gothenburg, southern Sweden
- 40 employees
- Company partnered with ABB
- Web site: www.teamster.se

### Spotlight on: Svedplan AB

- Designers and manufacturers of large-volume, flat-packed furniture
- Based in Alingsås in southern Sweden
- 140 employees
- 2005 turnover SEK 300 million
- Part of the Licentia Group
- Web site: www.svedplan.com

# Let robots take the heat

**At MP Filtri in Italy, robots working in the foundry was just the beginning. Machine tooling is now automated, and the company has helped solve its recruitment problems.**

Robots lubricate filters at MP Filtri.

By Claudia Flisi
Photos Maurizio Camagna

> It's hard to find a factory employee willing to operate a hot press for any length of time. The heat, stress and noise of the job take their toll, giving rise to quality-control issues as well as danger to the worker himself. Robots are therefore an increasingly attractive alternative in foundries, especially when the volume of work is large.

MP Filtri of Pessano con Boragno (Milan), Italy, one of the world's top manufacturers of hydraulic oil filters, came to this conclusion in the 1990s. At the beginning of the decade the company decided to expand aggressively by seeking international business, and it soon found itself competing against giant corporations from the United States – its main competition – and Germany, among others.

Its in-house foundry was and remains an important element in MP Filtri's business strategy, says Giovanni Pasotto, managing director and son of Bruno Pasotto, MP Filtri's founder and still-active president.

Giovanni Pasotto explains that the company's competitive advantages are many. The company maintains a high quality of service, emphasizing attention to the customer and speed of delivery. It also focuses on specific market sectors so MP Filtri can cater to their needs. These sectors include moving vehicles such as cranes, excavators, tractors, earth movers (this is MP Filtri's largest market segment); industrial installations for steel and iron works; injection machines for plastics and aluminum; and a small but image-rich niche market in offshore platforms. "We compete extremely well in terms of range of product," Pasotto says.

One other important advantage is that the company has its own foundry for aluminum filters, which enables MP Filtri to control the entire production process. "We can move more quickly than our competitors, while [at the same time] ensuring high quality," says Pasotto.

**The strategy behind** these competitive advantages was working in the early 1990s and orders were coming in, but the company struggled to find qualified workers to handle the demands of the job. Foundry work requires highly motivated, skilled personnel and MP Filtri could not find enough of them. So the company decided to turn to robots. While just about all foundries have robots for injection machinery ("because you wouldn't invest in such equipment without them," explains Pasotto), the company wanted to be more forward-thinking in its production design.

In 1995 an ABB IRB 4400 robot, arrived at the foundry, followed by another IRB 4400 and an IRB 2400 a year later. The choice of ABB was based not on price but on its reputation for superior customer assistance, service and client satisfaction.

The foundry robots remove newly moulded filters from the hot presses, lubricate them and deposit them on slides where they can cool before collection for successive tooling. "Our workers were happy to see the robots arrive because now they are relieved of a hot, hard, noisy, repetitious task," says Massimo Frignati, the manager for the MP Filtri foundry. He points out that robots can produce 60 filters an hour, weighing from 50 grams to three kilograms, as opposed to manual production of six filters an hour.

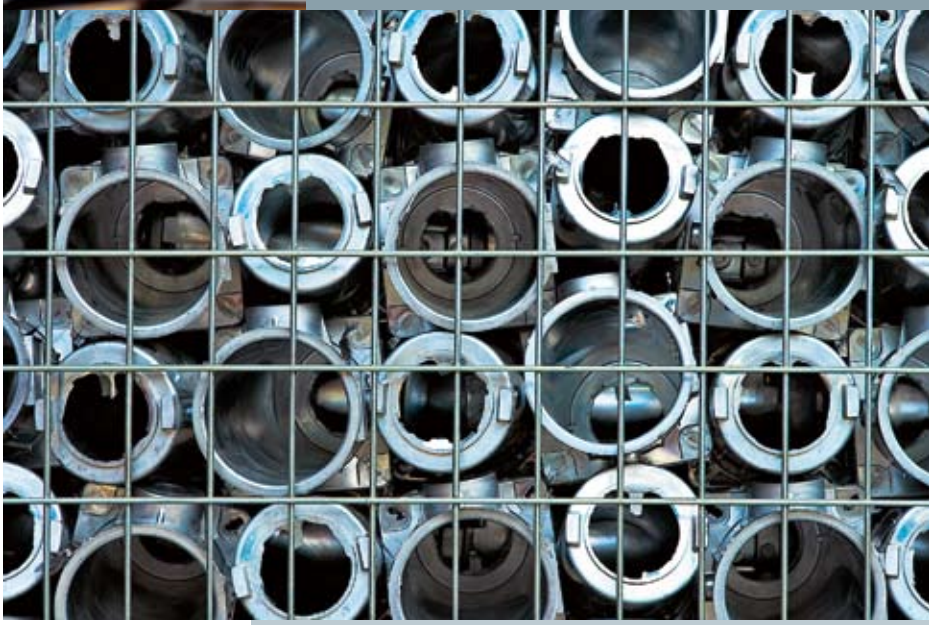
In addition to increased productivity, the three robots can be managed by one employee, whereas in the past each hot press required a dedicated worker. "We have less waste, more consistency, fewer errors, better quality control and more uniform production," says Frignati. For example, the percentage of rejects dropped from 10 percent to 2 percent. He adds that since their arrival, all three machines have been working without a problem.

Given the successful integration of robotics into MP Filtri's foundry, it is not surprising that robots would find their way into machine tooling as well.

Cesare Gatti, head of the machine tooling shop, explains, "We realized we needed to invest in robotics when we bought new machine tooling equipment >

"We compete extremely well in terms of range of product."

Giovanni Pasotto



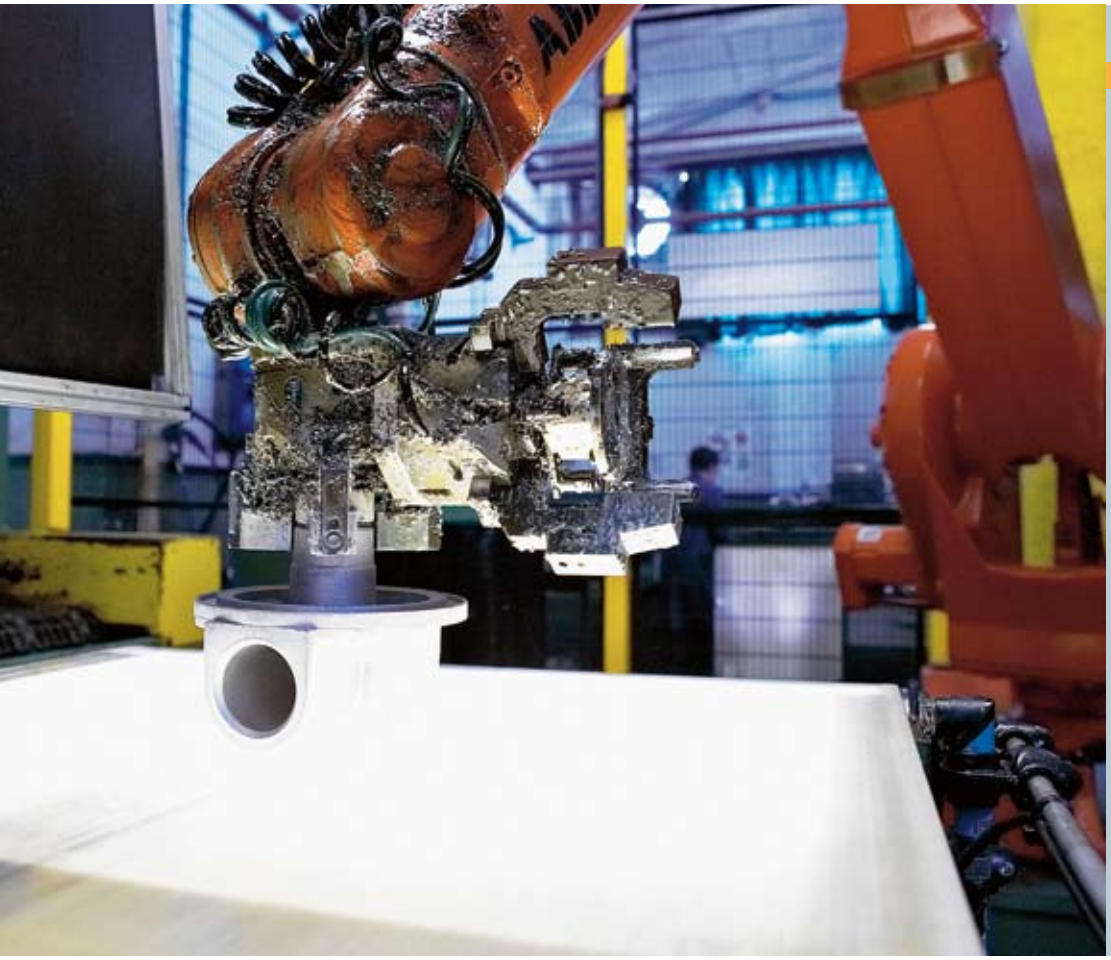
Filter parts await further handling.

>FACTS

### Unfiltered advantages

MP Filtri currently uses six ABB robots: two IRB 2400s, three IRB 4400s and one IRB 6600. Three are used in the company's foundry; three are in machine tooling. Their advantages include:

- Easier to recruit new employees
- Greater productivity. The production line can accomplish in two hours what used to take eight man hours
- Better, more consistent quality
- Rapid payback. Managing director Giovanni Pasotto estimates that payback for the first robots came in about two years and could have been even faster "but the first six months were a learning experience for us."



A robot deposits a lubricated filter on a slide.

>FACTS

### MP Filtri at a glance

MP Filtri of Pessano con Boragno (Milan), Italy, was founded by Bruno Pasotto in 1964 because Pasotto wanted to go into business for himself and saw the market for hydraulic filters for oil as a promising opportunity. MP Filtri quickly became Italy's market leader and is today one of the top 10 in the world in this specialized area, producing 1 million filters annually in aluminum, cast iron and steel in a wide range of sizes. The company's 150 employees generate 25 million euros in sales per year and have offices in eight countries: Canada, China, France, Germany, Italy, the United Kingdom and the United States. You can read more about MP Filtri at www.mpfiltri.com.

> and realized that our personnel were too slow to take advantage of the capabilities of the machinery. Since we already had ABB in the foundry, and those working there were happy, we decided to stay with them."

An IRB 2400 and IRB 6600 arrived in 2002 and were joined by an IRB 4400 in 2005.

**Whereas the foundry robots** have improved quality in a high-stress situation, the ones in machine tooling have improved productivity and precision. The IRB 2400 and IRB 6600 are used to pick up filters after they have been washed (the weight of the filters determines which robot will handle them), hold them up to allow water to drip off, then place them in precise rows in a basket. When a layer of the basket is full, the robot "sees" that and picks up cardboard dividers and lays them over the filters to create the next layer.

Three robots can be controlled by one employee.

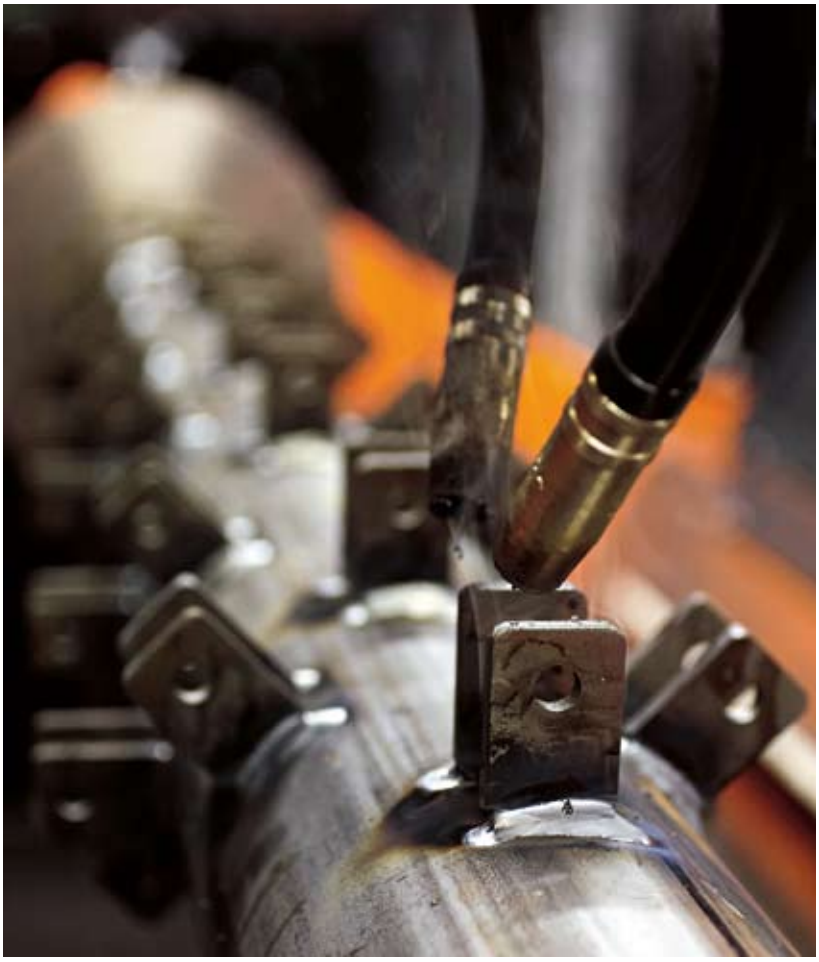
The IRB 4400 manipulates aluminum filters as they are machine tooled in a series of programmed steps: It picks up each filter, places it on a platform to ensure the correct positioning, picks it up again, inserts it into the machine tooling equipment, removes it, inserts it into another machine that cleans the filter with a burst of air, removes the filter again and places it on a pallet.

Gatti says that there has been "an enormous difference with the robots. We gained a lot in productivity, because we have no more downtime."

**Both Gatti and Frignati** would like to introduce robots into other processes in their areas, and Giovanni Pasotto is also willing to entertain such investments, because the payback is so immediate. According to Pasotto, by 2008 the company will have new automation processes and will be using robots for painting, machine tooling and aluminum processing. "We will automate machine tooling because we are committed to improving quality, to be more competitive on the world market," he says. "Plus, robots don't give you any problems. They are productive and efficient, and they free up our employees to do other things."

**When the Kverneland Group switched to robots for manufacturing tractor parts, not only did it improve production, it also saved money by reducing tied-up production capital.**

Fred Lysemose, DanRob, and Kverneland's Ulrik Bastholm admire a rotor, produced in less than half the original production time.



With the ABB robot, Kverneland now have one process, compared with four in terms of welding the rotor.

# The grass is greener at Kverneland

By Martin Neander
Photos Magnus Torle

> The goal of the Denmark-based Kverneland Group is to provide the professional farming community with high-quality machines and professional after-sales service. Through its Taarup brand products, Kverneland provides solutions for the production and processing of grass.

Ulrik Bastholm, at Kverneland's factory in Kerteminde in Denmark, says the Taarup brand combines the disc mower principle with a conditioning system, an innovation that has reduced farmers' work in the fields and dramatically increased the quality of silo feed. Taarup was the first brand to launch a packer for large bales. The round baler has improved feed quality and provided farmers with increased flexibility during harvesting, storage and feeding. Today, Taarup is considered one of the leading brands for harvesting, processing and feeding of grass, alfalfa and corn.

"The Taarup range offers machines that cover the entire grass-processing operation, from mowing, harvesting, baling and packing to mixing and feeding," Bastholm says. "The range varies from small machines to the most advanced solutions, such as mounted and trailed mowers and mower conditioners, rakes and tedders, forage harvesters, round bale wrappers, bale choppers and feeding equipment."

**At the Kerteminde plant,** disc mowers and mower conditioners are produced for tractors. Using a conditioner encourages faster drying of grass and reduces risks related to weather. Moreover, the conditioner system reduces leaf loss and produces a fluffy swath.

"The new Taarup steel tine conditioner offers a new solution when it comes to aggressive conditioning and low maintenance," Bastholm explains. "It has a high degree of protection of the tine when hitting foreign obstacles."

In order to make the production of the conditioner rotor more automatic, Kverneland has acquired an ABB robot system.

"With the ABB robot, we now have only one process, compared with four in terms of welding and making the rotor," Bastholm says. >


> Today, the welding of conditional rotors is fully automatic, with a capacity of one and a half rotors per hour. The robot system is able to weld rotors of up to 4 meters in width.

"It is also better for the operator, who does not need to take the bars and put on 144 tines, while welding them manually," Bastholm says. "The ABB robot takes care of all that automatically."

In February 2006, the Danish ABB partner DanRob installed the robot system. Bastholm points out that the DanRob solution also offers reduced production time, compared with competitors' solutions. He says Kverneland now can weld the rotors twice as fast as before. Total production time for the rotor used to be two and a half hours; now it is only 45 minutes. In addition, just one operator is needed, compared with three operators before the robot system was installed.

"It is also possible to do the computer program-

>FACTS

## Kverneland

The Denmark-based Kverneland Group offers complete product ranges to professional farmers and contractors within grass, soil preparation, conservation tillage, spreading, seeding, spraying, grape harvesting and vineyard maintenance machinery.

The parent company, Kverneland ASA, is listed on the Oslo stock exchange and had revenues in 2005 of 497 million euros. The company has operations in 22 countries and exports to more than 60 countries. It employs approximately 2,300 people worldwide.

Kverneland ASA dates back to 1879 when founder Ole Gabriel Kverneland built a forge to manufacture scythes in the village of Kverneland, near Stavanger, in Norway. Later Kverneland started producing small ploughs. The company remained family owned and managed until it was listed on the stock exchange in 1983.

Since the mid 1990s, the Kverneland Group has expanded considerably through the acquisition of a number of manufacturers of agricultural and viticultural implements. Read more at www.kvernelandgroup.com.

## DanRob

DanRob specializes in standard and customized robotic solutions for welding and production. DanRob is located in Middelfart, on the Danish island of Funen. It has 23 employees and a service department that can offer comprehensive service.

DanRob is a certified partner with ABB and an authorized service plant for ESAB.

Read more at www.danrob.dk.

Frederik Berthelsen, one of Kverneland's most experienced operators.

### Main benefits for Kverneland with the ABB solution

- Reduces tied-up production capital
- One process, compared to the earlier four, in terms of welding
- Possible to do the programming ahead of welding
- Better working conditions for the operators

ming before we start welding the rotors," Bastholm says. "The position of different parts is calculated by a macro program according to a pre-defined pattern, which is entered in a menu in the robot's programming box. Parameters such as rotor diameter, number of parts and angles can be entered."

Frede Lysemose, sales and marketing manager at DanRob, says the robot is based on a modular system, including the IRB 2400 robot, IRBP manipulator, MigRob 500A, TCP with a Bulls Eye, operator panel and security system.

"Kverneland benefits from the ABB robot system because it boosts efficiency while also reducing tied-up production capital," Lysemose says. "It also reduces stoppages and increases quality. Production during lunch periods and pauses is possible, and the robot system improves the working environment for the operator."

# Healthy infection of ideas

By Claudia Magli
Photos IMA

**With pressure to save on costs and become more efficient, the pharmaceutical industry is learning robotic tricks from the food industry, with help from Italian automation specialist IMA. The space savings alone has been a big advantage.**

Flow-packed droppers arrive in random order for pickup by the IRB 340.

> IMA Industria Macchine Automatiche, with headquarters at Castenaso, Bologna, has a philosophy based on research and innovation. For over 40 years, the company has produced hi-tech automatic machines for the pharmaceutical, cosmetics, tea and coffee industries, with a wide range of customers all over the world.

Recently, the company devised a special version of the Flexa cartoning machine that integrates ABB's IRB 340 robot. Specially designed for a U.S. pharmaceutical company, the solution automates the pick-up of flow-packed droppers from a conveyor belt (where they arrive scrambled), and the insertion of the droppers in a carton along with a bottle containing penicillin. And all of this is done at phenomenally high rates.

In no small part, the solution is a result of the courage of IMA in revising, while the project was actually being developed, the feed concept that had already been fully approved by the customer. Instead, IMA proposed a more effective solution that transferred methods and experience from the food segment and cleverly adapted them to the specific demands of pharmaceutical production.

The new version of the Flexa cartoning machine was made to meet the demands of its American user, who needed to replace an old penicillin bottle packaging system where the dropper handling was mostly done by hand. The challenge, says IMA, consisted not so much in processing and placing the bottles in cartons, which is a usual demand that did not pose any problems, but rather in handling the flowpacked droppers, in particular at a rate of 150 pieces a minute. Flow packs are extremely variable, with some packs adhering perfectly to the product while others swell up, which makes them difficult to handle and position correctly for feeding into the cartoning machine.

To solve the problem, IMA used two FlexPicker ABB IRB 340 parallel robots. The robots pick up the droppers from a belt on which they arrive scrambled, and there the droppers are viewed and identified with the PickMaster, ABB's robot guidance system that includes vision based on Cognex hardware, which is integrated into the FlexPicker. Customized grippers were devised by IMA.

Once the positions and the orientation of the


droppers have been calculated, the PickMaster transfers their coordinates via the ethernet to each of the two robots, while phasing both their workloads, and the robots are capable of working at rates that are a lot higher than those demanded by the customer. The system works in several stages that entail the temporary storage of the flowpacks in minipallets, their subsequent orientation and, only after that, insertion into the cartoning machine.

**The solution devised** in cooperation with ABB offers a series of advantages. For one, the overall layout of the machine takes up less space. A risk analysis has shown that there are a limited number of critical points. And a robotized system, in the mid- to long-term, guarantees lower maintenance costs and a far less complex tooling-up period compared to mechanical solutions.

But what really makes the difference above all is the flexibility. By merely replacing the pick and place head of the robots, they can handle similar products, anything from syringes to spoons instead of droppers.

While the end customer was initially concerned about the programming of the robot, the problem ended up being non-existent, since IMA and ABB provide all the assistance needed, before, during and after installation.

As IMA has stated, the solution represents an "opening up, a dialogue between this segment and others, food first and foremost, in a continuous exchange of experiences and technologies, where everyone has a lot to gain. To confirm a certain synergy between the two areas that, up to even just a few years ago seemed far apart. More and more project engineers today committed to pharmaceutical companies have transferred over from the food sector, or at any rate come from the field of consumer products."

This is due above all to the growing attention reserved to costs and times, IMA states, two competitive variables that the pharmaceutical industry also pays increasingly close attention to. The radical changes that are affecting the entire pharmaceutical market force the producers – and thus their suppliers – to pay maximum attention to the overall efficiency of their lines; and in this the food segment has a lot to teach.

If in the past packaging lines were only devised for a single product and format, now they have to be flexible, efficient and adaptable to different products and formats. With these kinds of complex demands, robots can give the best answers as has been demonstrated in the food and in many other industrial sectors already.

>FACTS

### Why automate pharmaceutical packaging?

As pharmaceutical companies increasingly follow the food and other industries in automating their packaging processes, the solution from IMA using ABB IRB 340 robots is a good example of the advantages of using robots:

- the overall layout of the machine takes up less space
- limited number of critical points
- lower maintenance costs and a far less complex tooling up period compared to mechanical solutions.

### IMA at a glance

- World leader in the design and manufacture of automatic machines for the processing and packaging of pharmaceuticals, cosmetics, tea and coffee
- Consolidated turnover: 425.2 million Euro for the fiscal year 2006 (export: 92.3 percent)
- Employees: about 2,700, more than 1,100 are based overseas
- 15 manufacturing sites in Italy, Germany, Spain, U.K., U.S., India, China
- Worldwide sales network covering more than 70 countries.
- Read more at *www.ima.it.*

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