PLASTICS AUTOMATION

A MAGAZINE FROM **ABB** OCTOBER **2005**

State of the art **robot software** gives AD-plast its edge.

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In South Africa, Venture makes **better bumpers** for BMW.

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Technology: 6-axis robots do double the work.

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SITTING PRETTY with help from robots

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AUTOMATION

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from ABB for the plastics industry.

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Editorial

A 6-axis future

> The plastics industry is working under tremendous cost pressures these days, and manufacturers are in need of solutions that add value and provide flexibility. For more and more in the industry, the answer is the 6-axis robot. Not only can it unload the injection moulding machine, it can also perform post-process applications such as quality control, insert, assembly, marking, packaging and palletising operations.

But until now, 6-axis robots have used specific robot languages for programming which require specialized skills, making them difficult to use for non-robot specialists. In response, ABB has launched the improved IRC 5, a new control system that replaces the old S4C+ with a user-friendly application-oriented package designed specifically for the plastics industry. The interface for the plastics industry, the RobotWare Plastics-Mould software package, is now available for the injection moulding industry, and manufacturers such as AD-plast in Sweden (*see page 4*), who have installed 6-axis robots with RobotWare software, are already seeing the benefits.

ABB has also extended its range of shelf robots to better serve manufacturers working with injection moulding, especially those with large tonnage machines. The IRB 4450S is for injection moulding machines of 600–1000 tons and the IRB 1600, which can also be shelf-mounted, is perfect for injection moulding machines of 100–250 tons (*see pages 19–21*).

Other areas where ABB has had substantial success in the last year are in cutting applications (such as waterjet cutting and lasercutting) and painting of plastic parts, including the painting of bumpers such as is being done at Venture, in South Africa, where bumpers for BMW are produced (*see page 8*).

With this issue of *Plastics Automation* we show you the opportunities existing in using 6-axis robots as well as ABB's commitment to the plastics industry by supplying it with software and robots for increased profitability in the industry. Plus, ABB has a large number of plastics integrators in all parts of the world and together with our global service organization, it all adds up to giving you the best support to meet your needs.

Tore Lindström
Segment Manager Plastics
ABB Automation Technologies

Calendar

Come meet ABB at the following events:

Interplas
4–6 Oct. 2005
U.K.

Fakuma
18–22 Oct. 2005
Germany

Plast
14–18 Feb. 2006
Italy

Scanplast
4–6 April 2006
Sweden

NPE
19–23 June 2006
U.S.

Fakuma
17–21 Oct. 2006
Germany

Automation upgrade in North America

> North America-based custom moulder IPL Inc. have invested in a number of ABB 6-axis robots, along with the new user-friendly robot controller IRC 5.

The robots will be used at IPL's injection moulding facilities in Canada.

The robots will be performing operations around IPL's injection moulding machines.

100th robot celebrated

> Jenoptik Automatisierungtechnik, a producer of industrial solution systems for auto and other industries, celebrated the delivery of its 100th ABB robot in May 2005.

Jenoptik, which is based in Jena, Germany, uses 6-axis robots for a range of applications, in particular for laser cutting. The main task for the 100th robot from ABB – an IRB 4400 – will be to move automobile dashboards precisely and at exact intervals along a fixed laser cutting head.

The process involves a laser beam creating micro-holes on the backside of the dashboard using a special method that prevents the laser from completely passing through the material. The perforation makes the material brittle enough to break exactly at the perforation line in case the airbag is deployed. The front side of the panel is not affected by the perforation and the area where the airbag would be released remains invisible.

The system is being used for a range of automobiles, including Mercedes-Benz (all categories), BMW Z4, as well as the Opel models Astra, Vectra and Signum.

For over 10 years, Jenoptik has been developing and manufacturing complex industrial system solutions for material processing with lasers, and handling and assembly systems for the American, European and Asian markets.

Tore Lindström, ABB segment manager for plastics says he expects an even closer cooperation between ABB and Jenoptik in the future, leaving open the possibility for launches of products that the companies develop together.

More phones, more automation in Texas

> The Ft. Worth, Texas division of Perlos, an electro-mechanical module supplier, has ordered a total of 25 IRB 1400 robots to tend plastics injection moulding machines in the manufacture of mobile phone components.

Along with unloading the injection moulding machines, each robot cell performs several secondary operations as well, and then loads parts onto a tray.

Perlos, which is based in Finland, is expanding due to increased demand for mobiles. Perlos is a long-time ABB customer.

Robots help make medical components

> Fresenius, the multinational manufacturer of renal and healthcare products, has ordered 12 IRB 140 clean room robots to tend injection moulding machines used in the manufacture of medical components in Salt Lake City, Utah.

The order follows on a previous order that was successfully installed by ABB partner ACS earlier this year. Each robot cell unloads the injection moulding machine and then trims a gate from each part. The parts are then loaded on an outgoing conveyor.

By Graeme Forster
Photos Pontus Johansson

Easy programming

Robotization and the new software product RobotWare Plastics-Mould keep a small Swedish company out in front in the injection molding business.

> Michael Jonsson, owner of AD-plast in southern Sweden, has driving ambitions, both on and off the track. For him, cars are a passion. He loves driving competitively in go-karts at the nearby Anderstorp race track, which used to be a Formula 1 venue, and encourages the employees in his injection-molding company to join in the fun. And it's clear by the sheer volume of trophies and medals festooning the kitchen area of the company canteen that they do.

Back home, in Jonsson's garage, is another symbol of his automotive passion – an AC Cobra that is nearing completion after a year-long rebuild. When asked if he will be racing this car, he protests: "No, no, no … it's far too precious."

Jonsson's driving ambitions carry over to his work as well. AD-plast was founded in 1963 as a tooling company, but later moved into injection molding. When Jonsson bought the company in 1994, automotive components were a key product segment for the factory's output. And it has grown in volume since then. AD-plast is a fourth-tier supplier to companies such as SAAB

>FACTS

AD-plast AB

- Founded in 1963
- Located in Anderstorp, Sweden
- Plastic injection molding specialists
- Managing director: Michael Jonsson
- Sales (2004): SEK 68 million
- Number of employees: 28

With RobotWare Plastics-Mould, a new program can be installed and operational in 30 minutes, says Mikael Hensch.

>FACTS

Why Robots?

Robotization of AD-plast has allowed the company to remain competitive in the face of strong competition from the Baltic states and Asia. In particular, the company can achieve consistent quality levels throughout its production cycle while maintaining competitive pricing. AD-plast currently has 14 ABB robot units: one IRB 140; three IRB 1400 robots; one IRB 1600; eight IRB 2400 robots; and one IRB 4400.

"...if we look at our long-term survival, robotization is vital to the company's performance."

Michael Jonsson, AD-plast

and Volvo, and a new type of three-part cooling system hose connector that AD-plast makes for ABA can be found in a wide range of vehicles, including Mercedes-Benz cars.

AD-plast counts among its direct customers auto-accessory manufacturers Hiab, Thule and Mont Blanc.

In addition, AD-plast is working with such non-automotive customers as MODUL service, a subsidiary of ikea. As an example, Jonsson demonstrates a highly efficient onion slicer, for which the company manufactures the plastic body halves.

Jonsson says he feels bullish about the future and points to a leap in sales from 48 million Swedish kronor at the end of 2000 to SEK 68 million in 2004, despite the fact that he's facing tough competition from Asia and, nearer home, from the Baltic States.

What does Jonsson have that they haven't? Very simply, state-of-the-art robots.

From very early on in his tenure, Jonsson saw that ad-plast would not be able to compete as a business if it retained its old-fashioned, labor-intensive way of making injection mouldings. Everything that was made in a machine was subsequently handled by humans. Scrap sprue – the excess plastic on a moulding – was removed by hand, and all the checks and quality controls were done by hand as well. In short, the manufacturing was slow, time-consuming and subject to tea and coffee breaks. Today, the picture is very different: There are 14 ABB robots on site (a 15th was due to be delivered immediately after this interview) plus four robotized moulding machines.

Each robot sits at the center of a production cell complete with quality-control systems. Raw plastic materials for use in the molds is contained

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Mikael Hensch and Michael Jonsson keep things running.

Mikael Hensch checks results of his programming at AD-plast.

>FACTS

RobotWare Plastics-Mould software

- Allows for easy programming and operation of ABB robots used for plastic moulding operations
- Minimizes learning time, setup time, error recovery time
- Improves error diagnostic accuracy
- Uses program wizard to guide the programmer
- Provides graphic cell overview
- Shows picture of produced part
- Works for all robot cycles used for machine tending
- Results in automatic, safe home run

>

in a separate area of the factory, where it is first conditioned and then fed by vacuum hose directly to the respective automated molding machine. In the case of the three-part cooling system hose connector, both male and female parts are manufactured then checked prior to assembly by a robot vision system. Using a series of cameras, measurements are taken of each part to check that the cast pieces are within accepted tolerances (if there is an error, the robot system will reject the part). They are then assembled with an O-ring and subjected to an automated pressure test. Once this has been passed, there is a final inspection by the vision system before the parts are packed and dispatched. Packing is the only part of the operation that is not yet automated, but this will change shortly. Using the robot manufacturing technique allows the company to run 24-hour production in three daily shifts.

AD-plast is collaborating with ABB in the development of RobotWare Plastics-Mould software, a product specifically designed for easy programming and operation of ABB robots used for injection-moulding applications. "The key advantage with this software," says Anna Liberg, ABB's project manager for the development, "is to make the whole process of programming these robots faster and easier." And this means a smoother, faster startup for production. Operators don't need to know any programming language; there is a graphical user interface that uses symbols, and a program wizard to guide the operator through the program configuration. "It's definitely faster to program using the new system," says Mikael Hensch, in charge of programming at AD-plast. "A new program can be installed and operational within 30 minutes." It used to take Hensch and his team a day or more, if they were lucky. Nowadays, machines don't stand still while they are being programmed. And it offers greater flexibility – molds can be quickly switched between machines.

The new program is being evaluated on a handle for a Volvo car. It's a simple part, but the surface is very important. It must be cleanly cast, with no surface defects, because it will be printed later. It is molded and then picked out by a new IRB 1600 robot for subsequent packing (still by hand, but not for long). But the software is independent of the robot model, so it can be run on almost any standard ABB robot. "Uniformity is vital for this part," says Hensch, "and that's true for plastic moldings in general. Before automation, quality used to go up and down every time the operator had a cigarette break."

"If we look at our long-term survival," says Michael Jonsson, "robotization is vital to the company's performance. And [referring to the packaging issue] we must use robots to do more than they do today." More customers are asking about increased levels of service. "What else can we do for them? Do more. Boost quality. Keep prices down. This is a difficult race to be in, you know. But you are never going to win by standing at the side of the road, watching the competition flash past. You've got to get out there and fight." And Jonsson intends to be firmly in the driving seat. (*You can read more about RobotWare Plastics-Mould on page 18.*) ⊙

By Chris Whitey
Illustration ABB

Service agreements **save money**

ABB has customer service offices throughout the world to support their customers "wherever they are."

> In addition to all of the services you would expect from a world-class supplier – parts, 24-hour service, training and consultancy services – ABB also offers a wide range of comprehensive service agreements that have been developed over to support every customer's need.

The service agreements range from basic preventive maintenance to make sure routine services are carried-out properly and on schedule, to flexible "Integrated Service Packages" that incorporate many different services together under one contract. Typically these are tailored using years of experience to design solutions to support production quality and overall effectiveness. The ABB extended warranty agreements are extremely popular with new customers, providing guaranteed and predictable running costs for the life-cycle of the production investment.

An ABB service agreement delivers guaranteed response when needed, predictable and balanced costs, access to product and process know-how from the industry leader and an avenue for continuous improvement. Experience shows that customers who maintain a service agreement with ABB save up to 35 percent on their costs of automation maintenance, not even including the enormous costs otherwise associated with unplanned stoppages, for example.

From ABB's point of view, a service agreement is a great way to support its customers too. The regular visits allow ABB to make sure the equipment is kept running in good and proper condition, provide upgrades to software and maintenance routines and to provide consultation regarding possible productivity improvements to enhance the capability or performance of the line.

The latest technology is being utilized now to incorporate remote monitoring and diagnostics to service customer equipment. Using this process, ABB receives a message from the robot the moment it unexpectedly stops. ABB will know there is a problem even before its customers do. Data will be sent automatically, allowing ABB technical support staff to investigate and start problem resolution in minutes. When it comes to repairs – ABB understands time is money and minutes saved when production stops can result in thousands of dollars in risk.

...customers who maintain a service agreement with ABB save up to 35 percent on their costs of automation maintenance.

ABB also recognizes that each customer has their own philosophy when it comes to service – some prefer the benefits of out-sourcing to the experts and concentrating on their own core business, others have a more "fix it when it breaks" strategy. In each case, there is a service agreement to suit the need – all built upon many years of experience working with customers in the plastics and other manufacturing industries.

Whatever your needs, ABB has the service answer. Contact your local customer service office and ask them about a service agreement – you'll be surprised at what they have to offer. ⊙

World-class service means added value.

Bumpers for 150 cars a day are produced at Venture's Rosslyn plant.

Pampered by **paint robots**

By Elizabeth Love
Photos Alistair Cotton

Bumpers and side-skirts get the perfect touch with the help of robots at Venture, in South Africa.

> Mention "robots" in South Africa and people will think you are using the local slang for traffic lights on the city streets. But the ABB robots at the Venture plant in Rosslyn don't only look different, their mission is far classier: easing the flow of shiny, new BMWs off the assembly line.

Nine imported paint robots made their debut last June on bumpers and side-skirts manufactured by Venture for BMW's assembly line in Midrand, several kilometers away.

"The decision to go to robotics was to make the process more consistent," says Venture plant engineer Dean Vernon. "It is absolutely precise every time – it is all about accuracy."

Workers at the Venture plant took their new mechanized colleagues in stride – after receiving assurances that none of them would be fired due to the automation.

"It wasn't a big shock to them," says Vernon. "They just wanted to make sure they wouldn't lose their jobs."

Instead Venture trained the displaced workers at another plant using similar robots, so they would be ready for them once they were installed.

As ABB staff set up the robots and trained Venture workers in their use, frenzied construction began for a new plant that would become their home. Eight months later, the nine robots were already producing painted bumpers for 150 cars a day.

The new plant has the super clean look of a hospital and the ambience of a spaceship. Posted on two long white-boards in the spotless hallway were scores of complex statistical charts of temperature trends and paint colors.

"It is like a surgery in there – we have temperature controls, stainless steel floors, and everything is extremely clean," says Vernon.

A walk down the 100-meter corridor of the new plant offers views of the teams of traffic-cone orange robots involved in a curiously graceful choreography of bends and bows as they methodically spray slow-moving racks of bumpers and side-skirts.

"Sometimes they look like they have personalities because of the way they move," says ABB engineer Pieter Prinsloo.

The first section is titled the "Flaming Room" where two ostrich-sized robots bend long necks at the plastic bumpers to spew an

Reliable for routines

The nine ABB robots at work painting bumpers for Venture in Rosslyn, South Africa boast many benefits:

- **Reliability.** While the robot uptime is about the same as regular workers, their performance is smoother and more thorough.
- **Savings.** The focused and methodical spraying technique used by the robots saves on paint, with less messy spillage.
- **Better technology.** The paint flowing through the ABB robots becomes positively charged and therefore sticks more efficiently to the targeted bumpers.
- **Greater quality control.** Any irregularities in the bumpers painted by ABB robots can quickly be corrected as opposed to the unpredictability of human error.

>FACTS

Venture's vitals

Venture's bumpers can be found all around the world on cars exported from South African assembly lines.

- **U.S.-based Venture entered the South African market in 1997 and in 1999 moved to consolidate and merge manufacturers of plastic components for the motor industry.**
- **Venture South Africa supplies bumpers and plastic fittings to all VW, BMW, Daimler Chrysler and Toyota exports from South Africa.**
- **Through a vigorous capital investment program, some 100 million U.S. dollars were invested over a four-year period in South African plants in Durban, East London and Rosslyn, Pretoria.**
- **Venture South Africa employs 250 workers.**
- **Turnover increased from 200 million South African Rand in 1997 to some one billion Rand in 2003**

Venture engineer Dean Vernon says ABB is good both on the automation and paint sides, which is essential.

even blue flame to reduce surface tension and enable the paint to stick better to the surface.

Next is the "Prime Booth" where two bulkier robots spray red, grey or white priming paint to prepare the bumpers for the final color. Walls in each enclosed room are coated with grease to catch any stray mote of dust or dirt that might tarnish the paint-job. The robots tend to take from 25 to 30 seconds to paint each auto part, depending on its dimensions.

Like an excruciatingly slow amusement park ride, the racks of bumpers then ease down into the "Basecoat Booth" where three robots wielding multi-pronged applicators focus on applying more colorful paints to the bumpers, such as "Japan Red" and "Monaco Blue."

Outside this room is another white board containing several weekly "defect analysis" charts, which pinpoint any problematic trends in a particular color.

Ironically, the color that can cause the most problems is the austere Alpine White, a favorite among car buyers.

"It is a very difficult color because you are working from a black substrate and if there is a problem the white comes out looking almost blue," says Neville Van Wyck, a Venture robot operator.

Three basecoats are applied to each piece as they inch their way down from one robot to the next.

The final stop is the "Clearcoat Booth" which is a favorite because the two robots there apply that last final coat of clear shine that gives a new car that glimmery gleam. At this point the work of robots is done.

Flesh and blood employees take over for the one final check of the finished product in the "Wet inspection room," and then the bumpers are ready for their next ride: the BMW assembly plant.

About 50 cars are included in each color sequence, with an array of about 16 different shades to choose from. Yet the most popular colors tend to be the most conservative, with shades of silver, black and white leading the rest.

Although the favorite paint colors don't change too much, the content of the paint itself has become more environmentally friendly in past years. The arrival of paint robots to the Venture plant also introduced the change from solvent-based paint to the less harmful water-based paint.

ABB has also supplied a "paint kitchen" to Venture where all the different arrays of paint are mixed and stored according to their specific temperature needs.

> "The decision to go to robotics was to make the process more consistent. It is absolutely precise every time – it is all about accuracy."
>
> **Dean Vernon, Venture**

In the past in a different factory, Venture set up robots and paint mixing section with two different companies, but found it too time consuming to juggle them both.

"ABB is the best at the automation side and they are good on the paint side as well," says Vernon. "We learned in the past how complicated it is to have different people on each side."

Monthly troubleshooting meetings are held with ABB staff and there is also a person on call 24 hours should any urgent problem arise.

With one less complication out of the way, the Venture staff plans to continue to fine-tune their new robots so that by August they will be supplying parts to 200 cars a day.

"Right now we are trying to squeeze every last drop of juice out of them," says Vernon with a smile. ⊙

Alessandro Colombo of B&B Italia relaxes on a polyurethaned chair.

Sit in style

By Claudia Flisi
Photos Maurizio Camagna

Italian polyurethane producer Afros Cannon has long worked with furniture manufacturer B&B Italia to produce some of the world's most distinctive chairs and sofas.

> When Italians exclaim, "It's a 'Cannonata,'" they mean something is a sure shot, a hit, a blazing success.

Engineer Carlo Fiorentini's first polyurethane mixing machines were so good that his clients kept saying, "It's a Cannonata!" and that became the name of his company – Cannon.

Cannon was born as a result of the particular nature of polyurethane. It is a plastic formed by mixing a polyol (an alcohol with more than two reactive hydroxyl groups per molecule) with a diisocyanate or polymeric isocyanate in the presence of catalysts and additives. The formulation is purely chemical; because no heat, cold, or pressure is needed to create it, Italians right after World War II were producing it as artisans rather than industrialists.

Then as now, polyurethane represented a small percentage of the rapidly-growing plastics sector, but Fiorentini recognized its enormous potential for industrial applications. He had studied chemical engineering at the University of Bologna in the early 1950s, then worked with polyurethane in the research departments of Italian and American companies.

He decided to strike out as an entrepreneur, along with a fellow engineer, Leonardo Volpato, in 1964. Ignis, an Italian appliance manufacturer located in Varese, a province north of Milan, had asked the two engineers to make some pieces in polyurethane for a refrigerator Ignis was building. At that time the only prototype available was a model from the United States and it wasn't very good, Fiorentini recalls. So Cannon set up shop in Milan to manufacture polyurethane dosing machines, and later established a production base in Caronno Pertusella, an area in the province of Varese, about 20 kilometers north of Milan. Fiorentini named the latter "Afros," because afros means "foam" in Greek, and polyurethane foams as it forms.

Polyurethane expands as it forms – up to 80 times its original mass, depending on the additives in the original mixture. It is excellent as an insulator for temperature, used in refrig-

"We try to use ABB whenever we can because we prefer them. They represent reliability, quality, and worldwide coverage for replacement parts."

Christian Cairati, Afros Cannon

>FACTS

Cannon Afros at a glance

- Founded in 1964 in Milan, Italy.
- Headquarters in Caronno Pertusella, Varese, Italy. Privately held.
- Annual sales: approximately EUR 300 million a year for parent company Cannon, of which 110 million comes from machines, plants and turnkey operations for polyurethane processing. Remaining turnover is generated by presses for composite materials, thermoforming lines, industrial electronics, aluminum die-casting, industrial boilers, special heating ovens, and environmental treatment plants.

Christian Cairati and Alessandro Colombo work together to meet high standards.

erators and building materials, and for sound, used as casing for motors and appliances. It is also a powerful adhesive and used as gaskets for streetlights, cooker tops, car parts, and many other applications. It can be hard – for automobile parts – or soft – for furniture – and can be molded into almost any form. This material is amazingly versatile, says Christian Cairati, responsible for communication and marketing for Cannon Afros, demonstrating soft applications such as sofa seating and mattresses and hard structural forms for automotive parts and refrigerator doors. The applications are limited only by imagination.

Over the years, Afros has garnered more than 160 patents, 60 of them held by Fiorentini himself. This emphasis on innovation has helped keep Cannon a market leader, in spite of competition from two German-based companies. The three together represent about 80 percent of the market for polyurethane machinery, which in turn is about five percent of the world plastics market.

Cannon differentiates itself from the competition in several ways. Its innovation ensures that clients have access to cutting-edge applications that can be tailored to their specific needs. Its worldwide network is designed to serve multinational corporations. Plus Cannon's competitors developed from raw materials suppliers for polyurethane, so buyers of the machinery are compelled to buy from those suppliers. "We do not impose such ties," Cairati says.

Trend-setters in their respective fields, Afros Cannon and B & B Italia have worked together for more than 35 years. B & B Italia is a recognized leader in modern interior design: Its

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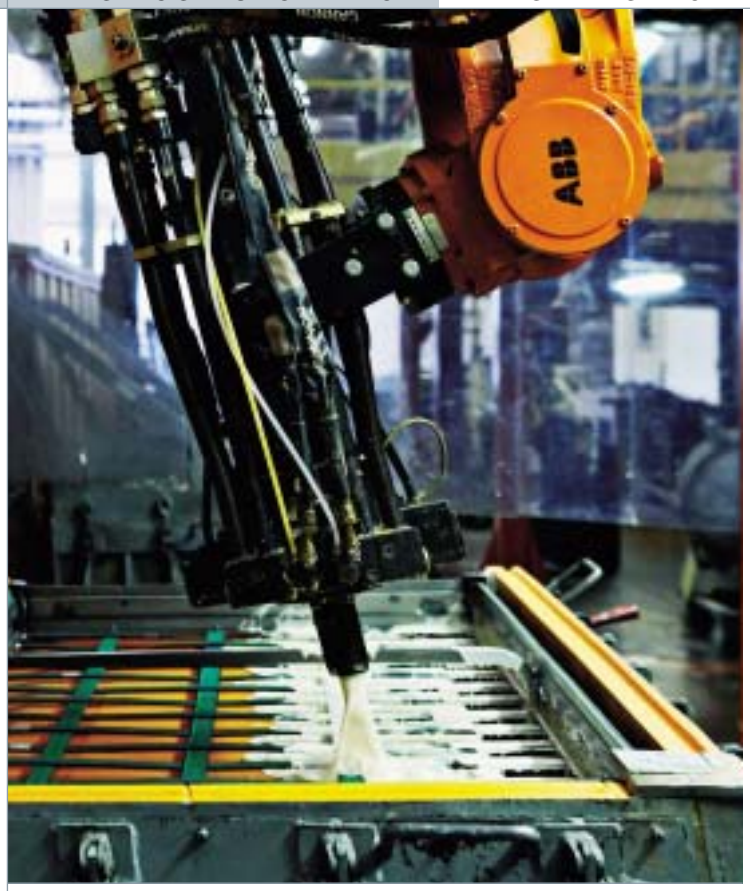
R&D at Afros Cannon plays an important role.



Robots spray polyurethane on B&B Italia furniture parts.

> furniture has won many international design awards and it has worked with leading names in contemporary design, including Bellini, Citterio, Pesce, Piva, and Afra and Tobia Scarpa. Its striking headquarters in Novedrate in the Como region, designed by Renzo Piano, are only 24 kilometers from Afros headquarters in Caronno Pertusella.

B & B Italia is known for its achievements in cold-foamed molded polyurethane, thanks to this long-standing relationship. "We were one of the first clients of Afros," says Alessandro Colombo of B & B Italia's center for R & D. "One of our Afros machines was installed 35 years ago, and we still use it."

Because B & B Italia has a total of 370 different moulds in production at any given time, and because the production line changes from one mould to the next, production machinery must have maximum flexibility. Afros equipment ensures the proper dosage of polyurethane to each mould, while ABB robots ensure precision and speed of movement – although speed is not as important in this application as are flexibility and reliability.

For example, an IRB 6400 robot from ABB accurately guides the head of Cannon model FP2L32, the largest in Cannon's mixing range, as it applies polyurethane foam at high pressure to moulds used in the production of soft furniture, such as sofas and chairs. Then the mould is closed and locked and moves slowly down the production line while the mixture inside expands. The line moves slowly because, like a soufflé, the polyurethane will "fall" if it is shaken unduly during these first critical seconds.

A distinguishing characteristic of the FP2L32 is that it can apply three different types of polyurethane, in response to the client's specific needs: one mixture to meet European standards, and another mixture (green coloring is added for differentiation) with higher anti-inflammable properties for the U.K. and North American markets, and other customers with high standards regarding inflammability, such as hotels, theaters, airports, nightclubs, ships, trains and other public venues.

There is also a third category: new mixtures that change, depending on the research being conducted. This third mixture is important to B & B Italia. To remain on the cutting edge of design innovation, it spends about three percent of sales on research and development.

Cannon has been using ABB robots for about 15 years. It does not use ABB exclusively because sometimes its customers require the use of others, but, "We try to use ABB whenever we can because we prefer them. They represent reliability, quality, and worldwide coverage for replacement parts," says Cairati.

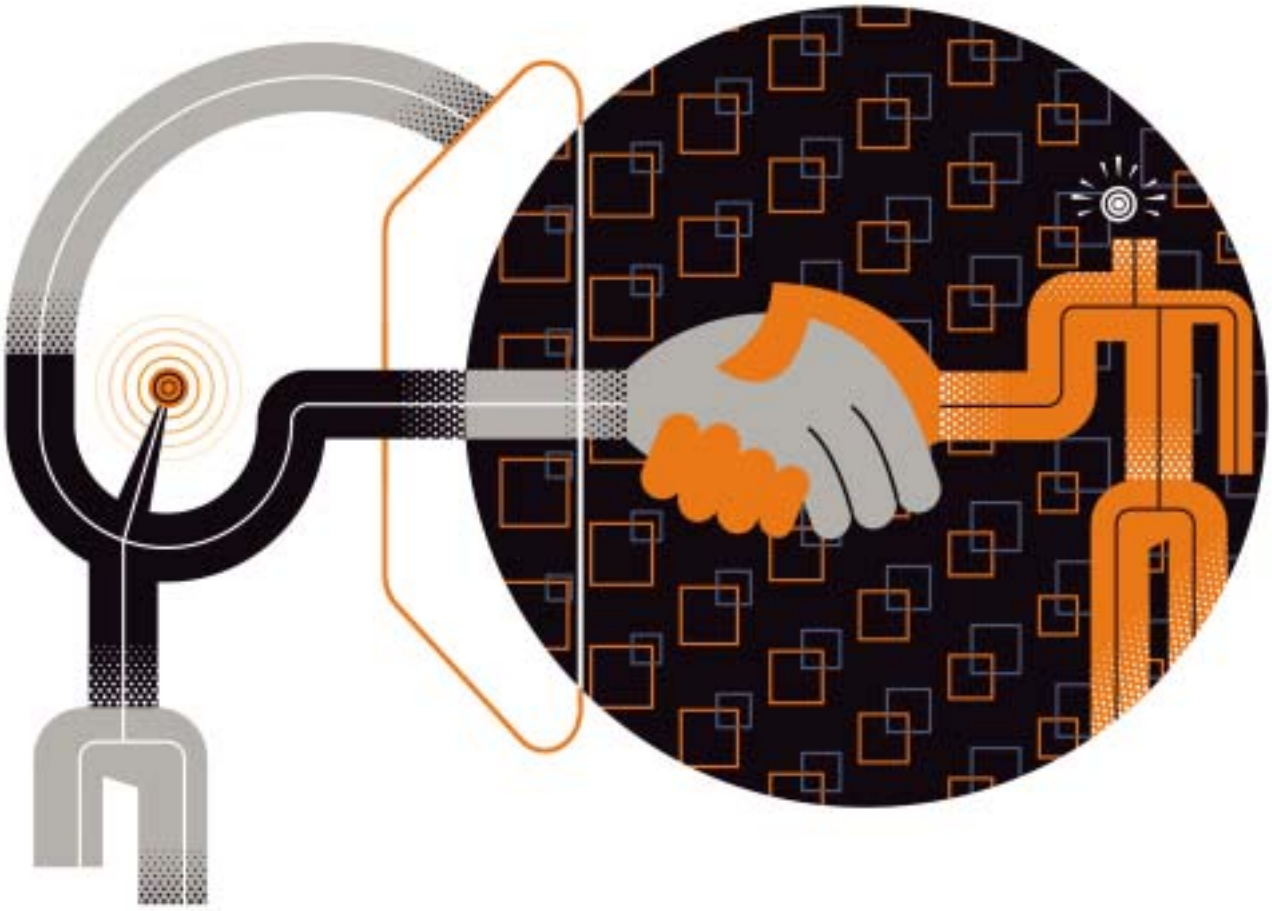
The gasket application in particular takes advantage of ABB robotics because the application of the polyurethane – as a kind of superglue to narrow and sometimes unusually shaped surfaces – requires speed, precision, and reliability.

"Our relationship with ABB is very important," says Fiorentini, "because robotics enables us to develop increasingly complex applications while maintaining a high level of quality in the final product. We are all about industrialization, and robotics are the maximum expression of industrialization – being able to substitute the work of men, or to add new processes, or more complex processes. Robotics are a complex combination of handling, form, and geometry."

Rather like polyurethane itself. ⊙

By Anna Liberg
Illustration Guy Crittendon, Corbis

Partners over the long haul



In Shanghai, ABB and Husky have formed a win-win partnership that ultimately benefits customers.

> In an increasingly competitive world, the paradox is that in order to compete, companies stand to benefit from cooperation. Partnering with other companies, building on synergies and then offering customers a better product is the smart way to go, whether you're in the music industry, or working with automation for the plastics industry.

It's no always easy, however. When two market-leading companies from two different parts of the world want to cooperate, it usually means hopping on an airplane and crossing oceans and continents. But if the cooperation with these same two companies happens to take place in the Waigaqiao Trade Free Zone in Shanghai, China, instead of crossing vast spaces, the partners are literally only five minutes away from each other.

But it takes much more than working in close proximity for a partner cooperation to succeed. Perhaps the most important ingredient is an openness to new ways of working and to new technology.

Fortunately for the Swiss-Swedish ABB >

>FACTS

Smart partners

- ABB and Husky have been cooperating at the Waigaqiao Trade Free Zone in Shanghai, China since the beginning of 2005
- The partnership has produced RobotWare Plastics-Mould, a software specifically for use with robots tending injection moulding machines
- ABB and Husky have created a production cell – an ABB robot tending a Husky120 injection moulding machine with a Husky-patented swing arm for part extraction – on display at the Husky Tech Center
- Future plans include work on robot-tended Thixo moulding

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Automation and the Canada-based Husky Injection Molding Systems, both of whom are represented in Waigaqiao Trade Free Zone, not only were there a lack of geographic barriers, there was also a will to embrace change.

ABB Automation, which has a sales, R&D and production facility at Waigaqiao, and Husky, which has the Husky Tech Center there, have cooperated with the development and testing of robot software for injection moulding machine tending since the beginning of 2005. The result is the ABB machine tending software RobotWare Plastics-Mould, which is right now finding its way to the first customers in Asia.

"For ABB R&D, it is indispensable to be able to test at an early stage new software in real life conditions," says ABB Segment Manager Plastics Tore Lindström, who initiated the cooperation between the two companies. "Also, Husky has, along with being a very good host, inspired us with its ideas and in-depth knowledge about injection moulding."

Such cooperation would never work unless involved parties look beyond the short-term efforts for the long-term benefits of a more complete and integrated customer offer for highly automated plastics production. An important common point for ABB and Husky is the focus on high-quality products and technical leadership within their domains, says Lindström.

Also when it comes to marketing, both Husky and ABB benefit from the cooperation by showing their customers a more complete offer.

The two have put together a production cell that can be seen at the Husky Tech Center where customers and potential customers can see the results of the partnership in a real-life situation.

For example, ABB invited those attending its February 2005 Asian Sales Conference to visit the Husky Tech Center. Every week, visitors to the Husky Tech Center, such as those from the March 2005 Shanghai Automotive Conference, for example, get to see the ABB/Husky cell in operation.

The cooperation has even led to ABB exhibiting in the Husky booth at the upcoming huge plastics and rubber trade show, IPF2005, held in Tokyo in September 2005. The cell at the show will feature an ABB IRB 140 robot and IRC 5 controller tending a Husky 120 injection moulding machine with a special Husky-patented swing arm solution for part extraction.

"This is a perfect example of cooperation with a partner that results in concrete results, not just with a new product, but also with increased marketing opportunities," says Lindström.

Husky's Russell Gray, general manager system, Asia Pacific, adds: "The cooperation to date has been terrific. These types of projects are what our technical centers are all about. Showcasing a cell phone moulding cell with the ABB robot at IPF will take what was only months ago a development project to the market and demonstrate what can be achieved through working with great partners.

"At our technical center in Shanghai, we are looking at opportunities to install robots on machines ranging from 120 to 2700 tons, demonstrating cost-effective part removal and post moulding operations for 3C and automotive applications which are key growth markets for our company in Asia."

While ABB and Husky may be finished with their work on Robotware Plastics-Mould, they are far from finished with their partnership. You can look for more from the partners – everything from work on robot-tended Thixo moulding to joint business offers.

"This is just the beginning," says Lindström. ⊙

By Karin Dunberg
Photo Lars Andersson

Top tool

RobotStudio plays important role in high-tech hub in France.

Daimen Page programs robots for the 22 Plastic Omnium plants worldwide from his office at the Sigmatech center in Lyon.

> Plastic Omnium is a leading motor vehicle equipment manufacturer, supplying exterior plastic parts such as bumpers, wings, tailgates and under frames to car manufactures globally. The company's Sigmatech center in Lyon is one of the most advanced research and development centers in its field. Its mission is to create customer satisfaction through creativity, innovation and industrial competence. The Sigmatech center gives all the tools needed to strengthen the company's position as an expert in the architecture of auto body systems and modules.

Plastic Omnium has about one hundred ABB robots. Most of them are used in the painting process, including flame scarfing robots, priming robots, lacquering robots and also a few handling robots. Plastic Omnium has 22 production sites spread in 11 countries, mainly in Europe, and South and North America. Sigmatech is a R&D center for the Plastic Omnium production plants world wide. All ABB-robots are programmed offline in RobotStudio at the R&D center in Lyon before they are sent out to their local production plants.

Daimen Page is a robotics process and paint expert at the Sigmatech R&D center. He provides technical support for the 22 Plastic Omnium plants worldwide. "Today we have a pilot painting line where we validate processes and develop customer projects for the local plants," says Page. "RobotStudio helps us when it comes to testing and validating of new processes, working methods and technical support for the production sites."

For Page, RobotStudio is an efficient tool when it comes to feasibility studies. RobotStudio is used to check the reach ability and cycle time. "Before, we programmed our robots using the programming teach pendant," he says. "This method was quite cumbersome to manage, as all the equipment had to be set up before the programming could be done. This required a lot of time as all the equipment had to be set up in advance. The line was used both for programming and for developing processes.

"Because we are a research center, we have to adapt to the mechanical configuration of the different plants that don't necessarily have the same conveyors or the same line adjustments. This is very time-consuming to do on-line."

The key advantage for the Sigmatech site is the ability to develop programs outside the pilot line without immobilizing it. Since the investment in RobotStudio, Sigmatech can concentrate on the robot programming part and use the pilot line mainly for process development. This has led to an increased productivity.

"One of the good things about RobotStudio is that is operates under Windows, which most people know how to use," says Page. "What is difficult to take on board is the use of a virtual robot. You have to make the difference between a virtual robot and a real robot. However, as soon as this difference is understood, it's easy to reload the parameters from a real robot to a virtual robot and the other way around."

RobotStudio is appreciated among Plastic Omnium's customers. By providing them with videos of simulations in RobotStudio and transferring the program directly to the production site, Plastic Omnium shows its expertise in carrying out paint application projects.

Page gives an example: "One of our customers is Smart. RobotStudio was used to show them the state of progress for each type of part. In this way Smart could follow the project in detail, the programming phase, the positioning of parts, etc. The fact that we could show simulations and thus prove that production is possible with our equipment really reassured the customer."

Page sees many future opportunities with RobotStudio: "We would like to roll out RobotStudio at all our production sites so they can develop future projects themselves, instead of having everything done at the Sigmatech R&D center. Off-line programming has been carried out at the Plastic Omnium plant in Guichen. The plant operates in three eight-hour shifts and is very busy. Thanks to RobotStudio they can now avoid immobilizing production resources and don't have to program during the weekends anymore." ⊙

By Graeme Forster
Photos Pontus Johansson

Splashing out

Plastic gearboxes roll off the line at Holmgrens.

Holding your head up in the global market for injection moulding is a tough business, and only the fittest will survive. Here's how one successful company manages the task.

> On most Tuesday mornings throughout the year, a group of men gather at the local pool in Anderstorp, a quiet town about 450 kilometers south of Stockholm. They swim for about 1000 meters; take a sauna and talk about business. Not an unusual activity for Swedes, you may think. But these men mostly work in the dozens of injection plastics companies that have grown up in the surrounding area. And few of them see each other as rivals: they use the time to exchange ideas, talk about meeting present-day production problems and how to meet future challenges. One idea that has just borne fruit is to create a dedicated educational facility in the area to provide students and employees with an academic and practical course in polymers and plastics.

Kenneth Klint, plant manager at Holmgrens Plast AD in Gnosjö, is both a member of the Tuesday Club and a rector of the new college. Why the focus on plastics in such a small area? Klint says the region was once big in metal-casting, and as that industry died out, there was a natural progression to injection moulding with plastics. The moulds that are used in both industries are similar. Many members of the Tuesday Club have worked together at some point in their careers. And they are equally determined that their plastics expertise should not go the way of the iron works.

A visit to Holmgrens Plast shows why it might be better placed to survive: Robotized production gives it the flexibility it needs to stay competitive. Housed in a gleaming white building with smoked glass, the place looks more like a James Bond film set than a plastics factory. Stefan Holmgren, the managing director and sole owner, founded the company single-handedly in 1989.

Growth took off between August 1999 and the beginning of 2001, when turnover rocketed from SEK 18 million to SEK 50 million. This year it has topped SEK 65 million, and suddenly the 3400-square-meter palace is feeling cramped. Holmgrens is now looking to double the amount of space by expanding the factory. There are 10 robotized production cells, of >

Holmgrens Plast AB
- Founded 1989
- Located in Gnosjö, Sweden
- Plastic injection moulding specialists
- Managing Director: Stefan Holmgren
- Turnover (mid 2005) SEK 65 million
- No. of employees: 29

An ABB IRB 1400 robot assembles a boat trim board before it undergoes heating.

Stefan Holmgren, left, and Kenneth Klint.

> "The parts that will be made in Scandinavia will be produced by companies that are very skilled, efficient and flexible."
>
> **Kenneth Klint, Holmgrens Plast**

which four feature 6-axis systems from ABB. Production is run around the clock, seven days a week.

Today, Holmgrens works in many markets. Industrial companies make up around a third of its production capacity. It makes component parts for ABB among others, and manufactures and assembles an award-winning boat-trimming system for Volvo Penta, a fuel-saving device that enables a boat to stabilize much quicker under acceleration. Holmgrens' own product ranges account for another third of its output – its plastic refuse collectors are incorporated into most Scandinavian and German fitted kitchen systems. The last third of its current output is actually for the biggest client. It makes "buggy boards," little two-wheel trolleys that can be hooked behind baby strollers and for young kids to hitch a ride on. The investment in the two robotized cells that make the boards saved the costs of hiring twelve new employees and paid for itself within the first twelve months.

The production of the boat trim system illustrates how one of the cells works. Essentially, the trim system is a box that is secured to the back of a boat, and which houses a retractable blade that can be raised or lowered via an internal gearbox. When lowered, the blade creates upward pressure on the boat's stern, which brings the boat into plane much sooner than normal, thus saving fuel. The various parts are cast and then assembled together with the blade and the gearbox by robot, which then places the entire unit in a heating unit, so that the foamed polyurethane reacts to form a soft, water-tight gasket.

But the unit does not represent a big-volume production at the moment, so the robot could be used for other tasks at the same time. This is where Xflex comes in – the modular solution supplied by technology partners Animex, who supplied the ABB robots. Normally, six units are used for injection moulding, and are placed in a semi-circle around the ABB robot. Each of these modules can then be moved between different production cells to improve flexibility. And this process is further simplified through ABB's RobotWare Plastics-Mould, a software product specially designed for easy programming and operation of ABB robots.

The buggy boards use a combination of 3- and 6-axis robots in two cells that were designed by Animex. The plate of the board is injection moulded and additional parts are brought into the cell for assembly by the 6-axis robot. The simpler 3-axis units are used for picking the plate out of the mould, and finally stacking the completed article for palletization. There is also a vision control system for checking component quality as part of the cell.

Automation, reckons Klint, is the only way to survive in Europe and to stand up against the competition. "The parts that will be made in Scandinavia will be produced by companies that are very skilled, efficient and flexible. You have to be fit to survive. It's a law of business. It's a law of nature." Certainly, the Tuesday morning swim seems to help. ⊙

Formed In Place Foam Gasketing

Formed In Place Foam Gasketing – FIPFG – is an economic alternative to the assembly of conventional prefabricated sealing profiles. The procedure makes complex, precise and also three-dimensional seal geometries possible in the electrical industry and in switch cabinet construction.

Ceracon has the exclusive licensing from UniSunstar BV Engineering Inc. Tokyo for building the processing technology for Europe and North America. At Ceracon in Weikersheim, Germany, 40 people work with further optimization of the technology.

New software for easy programming

RobotWare Plastics-Mould, a new software product from ABB, will simplify robot programming in injection moulding.

> As the use of 6-axis robots in the plastics industry spreads further due to manufacturers needing to find added value and to save time and money, software such as ABB's new RobotWare Plastics-Mould is key.

RobotWare Plastics-Mould will simplify and speed up the process of programming ABB robots used in plastics injection moulding applications.

Robots must be easy to use for both the operators and programmers. Six-axis robots have until now relied on specific robot languages for programming making this a reason not to use 6-axis robots in the plastics industry.

With the launch of the new IRC5 controller and RobotWare Plastics-Mould, the possibility opens up for application-oriented user-friendly automation packages. ABB has put a lot of effort into developing the interface for the plastics industry for use in common and uncommon applications, such as injection moulding.

RobotWare Plastics-Mould is designed to minimize the learning time, setup time, error recovery time and improves error diagnostic accuracy. Based on the pre-configured SPI and Euromap injection moulding machine interface, the program will enable faster and easier setup of robot-controlled moulding lines. The new program also incorporates a number of important safety and security features, including a user authorization feature; an automatic and safe home run; and a hot edit function to optimize positions and speed in the run mode.

The new program is being used by AD-plast AB in Anderstorp, Sweden, which has helped to fine-tune the program in a real-work setting.

"It is definitely faster to program using the new system," says Anna Liberg, ABB Project Manager. "As we are witnessing at AD-plast, a new program can be installed and operational within thirty minutes, replacing the standard programming times of a day or more. And for the manufacturer, this offers even greater flexibility as moulds can be quickly switched between machines. The key word is easy."

The new program is available for all ABB robots in the following series: IRB 140, 1400, 1600, 2400, 4400, 6600 and their different variants. (*You can read more about RobotWare Plastics-Mould on page 4.*)

RobotWare Plastics-Mould is available in Chinese, English, French, German, Spanish, Italian, Swedish and Japanese.

…a new program can be installed and operational within thirty minutes, replacing the standard programming times of a day or more.

Advantages of RobotWare Plastics-Mould:

- Easy to program and operate ABB robots used for plastic moulding applications
- Learning time is minimized
- Setup shortened from a full day to 30 minutes
- Error recovery time reduced
- Diagnosing errors is simpler
- Graphic cell overview is user-friendly
- Works for all robot cycles used for machine tending

Beyond linear thinking

For the ultimate in practical and flexible solutions for injection moulding and the plastics industry, 6-axis shelf robots are the answer.

IRB 1600

IRB 4450S

IRB 6650S

> Injection moulding is the preferred manufacturing method for geometrical plastic parts nowadays, such as car bumpers and recycle bins. Traditionally, the task of removing the plastic moulded part from the machine and placing it on an adjacent conveyor belt for further downstream processing has been carried out by linear, 2- or 3-axis robots.

"As long as it's only about picking up and dropping the part this works fine," says Tore Lindström, segment manager for plastics at ABB in Västerås, Sweden. "But few manufacturers today can afford the luxury of having a robot perform a fixed task."

Instead, what they are facing are several feed changes per day. Products are becoming increasingly customized, forcing manufacturers to reduce series and carry out more special procedures during each run. Meanwhile, the demands for minimizing throughput times are increasing at the same pace. In short, it takes a more versatile robot to do the job – it takes a 6-axis robot, such as ABB's IRB 6650S, IRB 4450S and IRB 1600.

The IRB 6650S

Just like a linear robot, ABB's IRB 6650S shelf robot is placed on top of the fixed half of the injection moulding machine. This gives it the same benefits as a linear robot: fast and easy access to the moulded part from an elevated position.

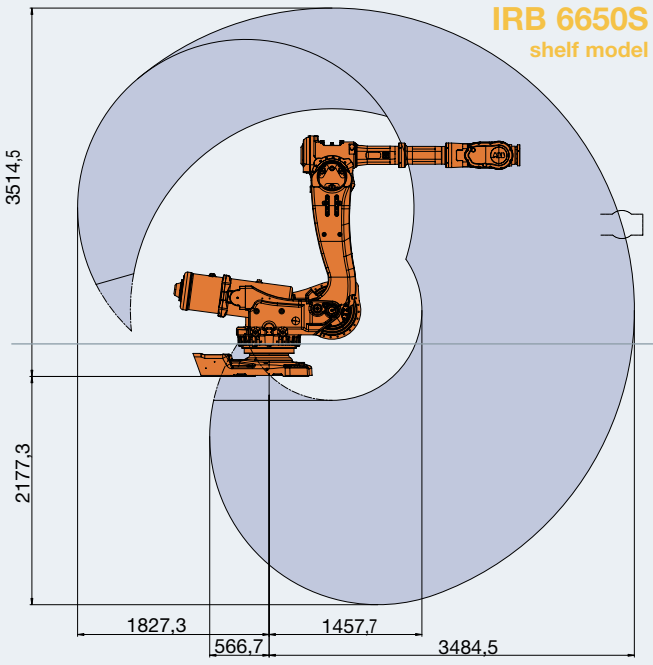
But while the linear robot, by nature of its fewer axes, is idle during shoots, the IRB 6650S can utilize these 60-90 seconds to perform one or several post-processing tasks, for example cleaning, flaming or camera-based quality control.

"What takes two or more downstream processes with a linear robot can all be done in parallel at the injection moulding station using the IRB 6650S," says Lindström.

Using its 3-axis wrist, the IRB 6650S can also twist and turn the work object in case it should get stuck – while the linear robot is confined to a linear movement (pulling straight out).

IRB 6650S lends its design from two best-selling ABB robot ranges: the bottom half is based on the IRB 7600, the upper half on the IRB 6600. This is key to the superior accuracy, robustness and reliability of the IRB 6650S.

A key feature of the 6650S is that it is a >



Unique software products

Collision detection, which reduces the collision force substantially, is especially useful on robots handling high payloads.

An electronically stabilized path will ensure that the robot will maintain its planned path to its best capability considering acceleration, drag, gravity and inertia. This feature is secured through TrueMove.

An active brake system, which not only controls the braking while ensuring the robot maintains its path but permits rapid recovery too.

To achieve optimized performance, the robot adapts to true payloads through its self-tuning performance. This feature is based on QuickMove.

> shelf robot, and can be mounted horizontally, vertically, above or even at an angle to the injection moulding machine. Not only does this free up badly needed space on the floor of the plant, but if the geometry of the moulded part is stretched out, it will be difficult for the floor-mounted robot to enter between the two machine halves to access its fixation point. And because the distance to the work object is shorter, cycle times can be reduced.

"If you can cut 2 seconds in each run, it adds up to hours every year – and many more units produced. So it's not uncommon that the payback time of the IRB 6650S is less than a year," concludes Lindström.

With upper arm extenders and a selection of wrist modules that allow for easy customization, the new IRB 6650S shelf robot is extremely flexible. The bend-over-backwards capability also means more compact production cells and a secure boost in productivity.

The IRB 6650S has a handling capacity of up to 225 kilograms, a reach of up to 3.2 meters, and a wrist torque of up to 1320 Nm.

A built-in Service Information System (SIS) monitors motion and load. Based on information received, the system anticipates the next service interval, making it easy to plan the service and maintenance requirements of either a single robot or an entire line. And WebWare means that this can even be done offsite – on the other side of the globe even.

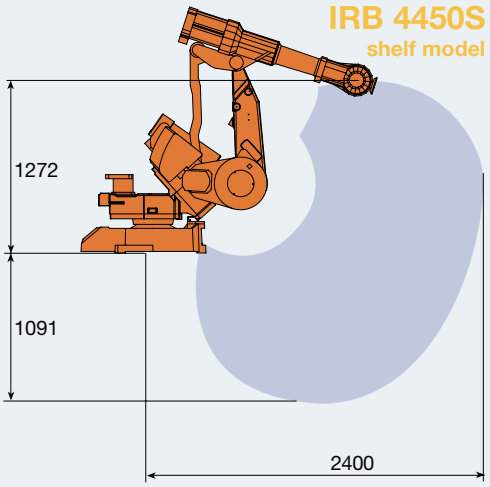
A safe investment through a range of software products – all falling under the umbrella designation of Active Safety – protects not only personnel in the unlikely event of an accident, but also the robot itself.

The IRB 4450S

With a reach below the foot of one meter and ability to handle a payload of 30 kilograms, the IRB 4450S is ABB's newest version of its IRB 4400 series robot.

Like the IRB 6650S, the IRB 4450S is an attractive alternative to a linear, 3-axis robot, conventionally used in injection moulding applications. Based on 6-axis technology, the IRB 4450S is superior in versatility, reach and precision – qualities that combine to minimize cycle times and optimize product quality.

The IRB 4450S can perform post-process tasks in parallel, including applications such as cleaning, flaming, quality control, punching and assembly – allowing plant designers to reduce the number of downstream stations and reduce plant throughput times.



The IRB 4450S can perform post-process tasks in parallel…

The IRB 4450S is based on ABB's high-volume IRB 4400 series of conventional, floor-mounted industrial robots. The IRB 4450S is the smart re-use of a proven success, with IP 67 protection in the wrist that makes it well-suited for a number of applications within the plastics industry.

The IRB 1600

The IRB 1600 is an all-round athlete, able to deliver plenty of performance for the money, combining compactness with a wide working range.

The handling capacity is 5 to 7 kilograms, with a reach of 1.2 or in the long-arm version, 1.45 meters. The IRB 1600 has all-around mounting capabilities and versions with shorter arm lengths (and thus shorter reach), give the

possibility to be mounted in small cells, a distinct advantage to producers wanting to improve cycle times in loading and unloading injection moulding machines of 100-250 tons.

The compact arm and wrist design facilitates entry into injection moulding machines, which do not need to open fully. The flexibility of the arm is further increased by the long 700mm reach below the base.

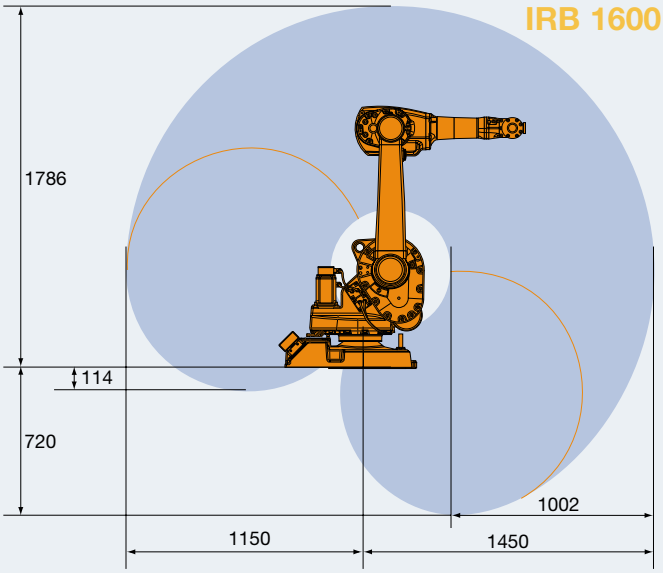
Superior levels of control and path-following accuracy provide excellent work quality for cutting and dispensing applications such as waterjet cutting and gluing, aided by a special motion control feature, TrueMove. Plus, the ability to adjust process speed and position means you achieve optimum manufacturing accuracy with little or no rejects.

With an axis1 working range of 360 degrees, the IRB 1600 can be used to perform additional applications after extracting a part from the injection moulding machine, for example assembly, quality control, labelling and other downstream processes.

For plastics industries applications, the IRB 1600 comes complete with Euromap 12, 67 or SPI interfaces. The robot also comes with the new ABB software product RobotWare Plastics, which includes features for easy programming, easy installation and easy operation of the 6-axis robot.

The IRC5 Robot Controller comes as a standard feature as well. The controller together with MultiMove software provide a simple easy-to-use operator interface. Programming can be carried out either on-line or off-line and used to build compact and efficient cells, with up to four robots independently controlled and operated from one controller.

> …an all round athlete, able to deliver plenty of performance for the money, combining compactness with a wide working range.



"This new robot is a major breakthrough in flexibility, speed and ease of use and integration in plastics manufacturing," says Tore Lindström. "More and more plastics producers are turning to 6-axis robots to gain a competitive advantage and in the IRB 1600 they have a new powerful automation tool to help them." ⊙

Technical Data IRB 1600, IRB 4450S and IRB 6650S

Robot Version	Payload	Reach	Reach below foot
IRB 1600-5/1.2	5 kg	1.2 m	0.5 m
IRB 1600-7/1.2	7 kg	1.2 m	0.5 m
IRB 1600-5/1.45	5 kg	1.45 m	0.7 m
IRB 1600-7/1.45	7 kg	1.45 m	0.7 m
IRB 4450S	30 kg	2.4 m	1.1 m
IRB 6650-125/3.5	125 kg	3.5 m	2.1 m
IRB 6650-200/3.0	200 kg	3.0 m	1.7 m

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

Big changes for small objects

By Chris Miles
Photos Characteristix

Robots turn around the production at plastic figure maker 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 GeKu-designed cell and its ABB robot have helped us to be ultra-competitive."

Andy Knight, Characteristix

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

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

The GeKu manufacturing cell includes:
- An ABB 6-axis IRB 140 robot
- Krauss Maffei injection moulding machine
- GeKu beam robot, conveyors, pneumatic printing press

plastic injection moulding machines. After being dogged by problems that couldn't be serviced, the machines were 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 indentify 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.

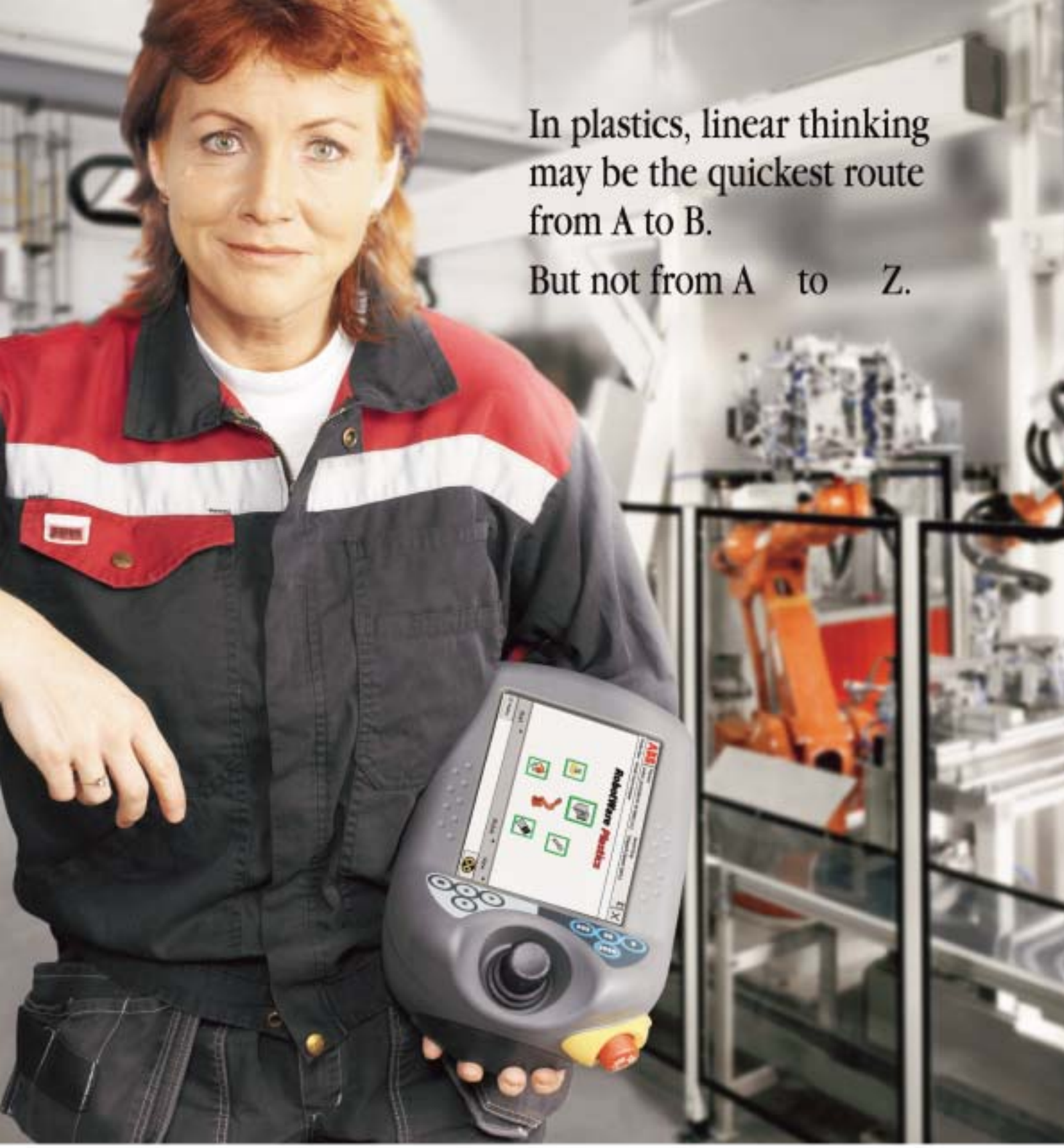
Not only has the cell ramped up production for the Cornish badge maker, but it has brought interest and variety to many of the production work force. "Many of our staff who were previously employed on manual labor tasks have risen to the challenge of robot-based manufacturing, readily participating in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

"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." ⊙

>FACTS

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



The heart
of Robotics

In plastics, the flexible and cost-effective world of 6-axes robots is a great complement to traditional linear gantries. Especially since most products, from mobile phones to home electronics, have extremely short life cycles. By introducing greater flexibility in your operation, you're ready to meet even the toughest demands of industrial and consumer goods.

Our robots cover the entire process – all the way from mold machine, via a host of post-processing applications, to final quality control of the finished part. And with software like RobotWare Plastics and RobotStudio at your fingertips, you'll marvel at the efficiency on the shopfloor.

For even more lateral thinking, go to www.abb.com/robotics.

ABB