



Injection Moulding

Case study: Bumpers, TYG, Taiwan

Applications in Plastics

- Cutting/Finishing
- Glueing/Sealing/Dispensing
- Flaming/Painting
- Assembly
- Packing/Palletizing
- Inspection/Quality control
- Machine Tending

A new robotic system has saved a Taiwanese auto body parts manufacturer money and man hours – and increased productivity.

Bumper benefits

Taiwan's Tong Yang Group, or TYG, has stayed ahead of the game for nearly three decades. It is proud to have retained its position as the largest, most specialized supplier of automotive spare parts in the world, and it is constantly looking at ways to improve the company's performance.

"Being No. 2 is not an option we even think about," says Mark Cheng, president of TYG's China Regional Division, based at the company's headquarters in Tainan, in southern Taiwan. "We've remained No. 1 by using the latest technology and investing in R&D. We are determined to stay ahead of our competitors." TYG was the first company in Asia to purchase ABB's IRB 6650 shelf robot, with the innovative IRC5 robot controller and the software RobotWare Plastics Mould.



The equipment, which was installed in April 2006, is used at the company's headquarters on its injection mouldings production line that produces car bumpers. The robot, which sits at the top of the 2,500-ton injection moulding machine, has been fitted with a special gripper designed by TYG, which has 10 suction pads that cleanly extract the plastic car bumpers from the moulds. The car bumpers are then lifted onto a conveyor belt, ready for trimming by hand and painting.

Saving money and man hours

Alongside is the IRC5 robot controller with preinstalled software RobotWare Plastics Mould, which is integrated with the injection machine to work together as a production system. In just a few months, the ABB robotic system has saved the company money and man hours. And when it went into a 24-hour operational mode in September, it achieved 20 percent increased productivity – with 15,000 car bumpers produced each month.

ABB provided technical, installation and application training. Basic pre-installation training required only three days. An additional three days were required for software and technical operational training. "The results are beyond our expectations," comments Yuh-Sheng Liang, manager at TYG's Aftermarket Manufacturing Division. "Being able to use the six axes of the IRB 6650s has meant more flexibility, increased speed and more stability. The whole operation becomes more efficient."

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Easy to use

Employees love the easy-to-use RobotWare Plastics Mould software, according to Cheng. In just a few steps, it can create new production programs to suit different car bumper designs. The use of graphic program symbols instead of complicated language programs is also highly appreciated.

“Unlike other robot brands, this software has graphics for the operators and programmers instead of the traditional programming, along with detailed instructions,” says Guann Chen, deputy director at the research and development center. “You don’t need to understand English, which could be a problem for some of our staff. You just need to click on the picture icons to operate the programs.” The whole system has made a big difference to the working environment. Previously, an operator would have to pull out the bumper parts by hand. It was dirty – and sometimes dangerous – work.

“Workers here would sometimes get cuts and bruises working on this line, and that could disrupt production – on average, at least twice a month,” says Chung-Han Won, production line leader. “The robot means we need one fewer person on this line, and we have reduced the equipment that we used to have here, since the robot does everything,” he says. “That’s made things much less noisy. It has helped us to increase productivity, and it’s made a safer working environment for the staff.”

Further robotization

Impressed by the results, TYG is looking at how other production areas can be robotized. The company is already using 13 ABB robots for its Taiwanese operations. Nine are in use at its Tainan headquarters, including an IRB 4400. This robot drives an application to laser-score dash panels, which allows an airbag to break through the

car dashboard in the event of a collision. Because of this, the company has opened up a completely new production line for made-to-order products.

Other ABB robots are used for painting, gluing, welding and water-jet cutting operations. “We are constantly looking at how we can apply the use of robots in our manufacturing areas,” says Guann Chen, at the research and development center. “We are looking to enhance quality, cost and safety, and ABB is our first choice. The company has a strong reputation, and we are confident about the quality of its products.”

TYG’s business philosophy is “humanistic management.” Its three watchwords – enthusiasm, honesty and creativity – are proudly displayed on the entrance to its headquarters. Using robots fits into that overall philosophy: improving the working environment for its employees and ensuring uniformly high-quality products for its customers.

Facts about TYG

- Founded in 1952. The company was established under the Tong Yang name in 1967, switching its focus from bicycles to motorcycle and automobile plastics.
- Founded by the late Kao Wu. His three sons, Michael, Raymond and Crispin Wu, now lead the operation.
- Employs 1,365 people at its two plants in Taiwan – 6,829 people worldwide.
- Maintains manufacturing and distribution centers in China, Thailand, the United States and Italy.
- Serves more than 1,800 major clients in more than 170 countries.
- Is the world’s largest aftermarket collision auto body parts supplier. The Tainan plant also carries out OEM work for established car manufacturers (accounting for about 30 percent of production).
- Reported annual revenues in 2005 of 13.6 billion Taiwan dollars (USD 414 million).

ABB and the Plastics Industry

ABB’s wide range of plastics robots can handle many of the tasks involved in and around injection moulding machines, regardless of required cycle time or size of the machine. Together with our partners, we provide automation solutions for most manufacturing processes in the plastics industry.