

Blow moulding

Case study: Fuel tanks, TI Automotive, US

Applications

- Machine Tending
- Cutting
- Vision inspection
- Welding

Products

- IRB 4400
- IRB 6600



Using robots for the cutting and machine handling of plastic fuel tanks for Big Three automakers in the U.S. has given TI Automotive new speed and flexibility.

Many people entering an automobile dealership are drawn to a car for the styling, the performance, and these days for the fuel economy. Not many give even a passing thought to the gas tank tucked up into the undercarriage. But though it's not glamorous, there's no component more important for a car's safe functioning than the tank and its fuel lines. And one of the world's leaders in fuel storage and delivery systems is TI Automotive.

Worldwide supplier

How important is TI Automotive in this business? With sales of close to 3 billion U.S. dollars and a worldwide network of facilities, they supply half of all cars produced today with fuel, brake and powertrain technology.

Besides the Big Three automakers in the U.S. this plant is also supplying fuel tanks to Honda and

Nissan. TI Automotive Engineering Manager Aaron Parisot has an equipment building background. He oversees the six automated lines in the plant. He points out the various production cells dominated by the color orange, a trademark of the ABB robots. "ABB has had a footprint in the facility since the first robotic line," says Parisot. That was in 1997, and even after a recent round of competitive pricing TI Automotive has found ABB still the best. In terms of customer support, explains Parisot, "They have been responsive. Now it's easy to find your contact there and get things resolved." All the passenger car and small truck fuel tanks made by TI automotive are produced in a multilayer blow moulding machine with the majority of the tank structure made of high density polyethylene plastic. Besides their corrosion resistance, plastic tanks are also lighter weight than steel and more resistant to impact.

The ABB logo is displayed in a bold, red, sans-serif font. The letters 'A', 'B', and 'B' are closely spaced and have a slight shadow effect, giving it a three-dimensional appearance. The logo is positioned in the bottom right corner of the page.

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Automated production line

Each of the six production cells in the plant moves in a straight, 200 foot line, beginning with the moulding operation where the pliable multilayer resin structure is extruded and moulded into the tank body, and ending 20 minutes later with the inspection station where the tank is tested and packed for shipment. All along the operation are IRB 4400 and IRB 6600 robots from ABB, performing cutting, inspection and material handling functions. The heart of the line is the welding cell. The orange, 165 kilogram capacity arms carry out precise welds on the various valves, fill tubes and clips.

David Betz is a plant process specialist. He sets up all the welding parameters and is the go-to guy for any problems the technicians may have with the welding operation and robots. He finds the ABB robots very reliable over the long term, noting that once the process is defined, the technology allows for precision, repeatability and robustness.

Turnkey solution

A key partner for TI Automotive is Axium Solutions, which delivered the turnkey solution for the tank line. Working with TI engineers they design and build modular robotic cells in its Montreal, Canada facilities, then transport the individual skids for assembly in Indiana. Heading the gas tank engineering for Axium is Dominic Prévost. "They're using our expertise as a robot integrator, but they are the owner of their own process," he says.

"We prefer to be an extension of their engineering. We want to sit at their table and discuss their process and adapt the system to their particular needs." Using robots in the production line streamlines the process, giving TI consistent, repeatable and highly accurate welds. Explains Parisot: "TI gains flexibility in location and performance of the welds. For instance you can run multiple part numbers through one line. The primary savings is in retooling costs." Research and development continues at TI. In Indiana they strive to make the welding more efficient and build prototypes for new car and truck models. Companywide they're addressing issues like hydrocarbon permeation and emission reductions.

ABB has been helpful to TI Automotive's operations by developing multitasking features in its software, explains Parisot. "Things can be happening in the background while the rapid, interpreted language is processing. So we can do data handshaking between the robot and user interface while the robot is executing a move."

> FACTS

Automation the way to go

- Strong customer support
- Fewer stoppages and less need for service
- Robot are accurate and provide consistency at a speed that means higher production levels
- Multiple parts can be run through one line

TI Automotive at-a-glance

- Business: Global supplier of fully integrated fuel storage and delivery systems, and fluid carrying systems for powertrain and braking applications
- Headquarters: Warren, Michigan and Oxford, England
- Revenues (2006): USD 2.9 billion
- Employees: over 16,000 in 27 countries
- Notable: TI Automotive products are in over 80 of the top 100 automotive vehicles
- Web site: www.tiautomotive.com