

# Injection moulding

## Case study: Junction boxes, ABB Ede, Netherlands

### Applications

- Injection moulding
- Packaging

### ABB Product

- IRB 1600



**Turning to robots to insert threaded studs into junction boxes saves time – and is easier on the environment – as compared to farming out the job to be done manually to a workshop.**

ABB Ede is a manufacturing facility in the Netherlands. Ede is the name of the town, which is situated halfway between the larger cities of Arnhem and Utrecht. ABB Ede is part of ABB Automation Products, but operates at arm's length so it is free to purchase any robot that provides the optimum solution. The business relationship is therefore one of supplier and customer and nothing is taken for granted. The company markets a wide range of electrical junction boxes, which are produced using injection moulding machines. A new model, which is a sealed unit that is mounted inside ceilings, incorporates two threaded studs that allow a lamp to be suspended. In order to carry the weight these metallic inserts must be either firmly attached or be an integral part of the junction box.

Before, the regular attachment process was done manually. Junction boxes were transported to a workshop, the studs were inserted and then

the box went into a press that deformed the base of the studs in order to hold them in position. Finished products were then transported back to the factory. This was a time-consuming process, output was constrained, and lots of kilometers were clocked.

### Process in house

When the new model was being designed, the company decided to keep the whole process in house, thereby removing the production constraint and reducing the impact on the environment. However, using a robot to insert the studs into the mould and making them an integral part of the finished product was not something that the company had done before and the process had to be up and running in nine weeks in order to deliver on time.



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“The combination of a brand-new application and a tight deadline was a significant challenge,” says ABB Ede project engineer René Wienholts. “At the beginning of 2007 we had commissioned Rokoma to deliver a turnkey, 6-axis solution for a packaging application that went well, so we engaged the same systems integrator. The solution was delivered on time. We’re running the insert application round the clock and producing about 3,000 junction boxes a day. If we’d stayed with the manual process the equivalent figure would be 500 a day.”

The new process involves a vibration table that puts the studs into position so that the robot can pick them up and insert them into the mould. Placement accuracy is a few hundredths of a millimetre.

### Further automation

Injecting the plastic and waiting for it to cool down takes around 25 seconds. When finished, an IRB 1600 robot removes the junction box and drops it into a cardboard container. The robot is therefore idle for long periods of time, so it could produce another product if there were two, parallel injection moulding machines, i.e. the robot would switch from operating from the left to the right and back again. This is a logical next step that the company is considering. The packaging application was implemented in early 2007. It involves separating

small junction boxes and arranging them into a 2 x 5 array, which is subsequently transported into a machine where they are shrink-wrapped. The package then receives two identification labels and finally it is placed into a cardboard container.

### >FACTS

#### The best out of robots

For ABB Ede, using a 6-axis IRB 1600 robot provided several important benefits:

- Production of junction boxes produced increased from 500 to 3,000 a day
- Flexibility of robot allows for possibility of using it for other simultaneous applications
- Less logistical headache by bringing the entire production in-house
- Lower environmental impact due to no longer shipping parts for manual production to other facilities and then back again for completion

#### All about ABB Ede

- ABB Ede manufactures plastic mouldings
- The company started in 1931 and currently has 125 staff
- Just under 500 different products are manufactured for the wholesale and consumer markets. The former are marketed in the Netherlands; the latter in Benelux, France, Scandinavia and the UK
- Website: [www.abb.com](http://www.abb.com)

#### All about Rokoma

- ABB partner and systems integrator for the injection moulding industry in Benelux
- Currently handling around 50 installations a year
- Typical project comprises consultancy, drawings, proposal, implementation, on-site training and ongoing maintenance
- Website: [www.rokoma.com](http://www.rokoma.com)