Stäubli robots transform productivity at a small injection moulding company

Stäubli robots are increasingly being used in injection moulding shops; the ease of programming and flexibility of the robots is such that even in smaller companies six axis robots are now making a valuable and effective contribution to improved productivity.

PRP Polymer Engineering of Hereford are the manufacturing arm of the Reevite Group, based in Bicester, leading suppliers of plastic and rubber mouldings for the electrical, electronic and agricultural equipment industries.

At their Hereford factory PRP employ 15 and operate a 24/5 production facility comprising 6 Arburg plastic injection moulding machines ranging from 25-50T and a range of rubber compression and injection machines ranging from 50-250T. Difficulty in recruiting moulding machine operators and the need to control costs prompted David Wilkins, MD, to consider automation as an alternative. From the outset, David realised that six axis robots would provide a much better solution than conventional beam robots that would not be able to demould and then orientate and process the components by replicating precisely the movements of the operators. Three robot manufacturers were asked to quote and recommend suitable six axis systems.

Part of PRP Polymer Engineering's injection moulding shop at their Hereford factory

Following an extensive process of evaluation that took several months Stäubli were selected as the robot supplier. PRP were particularly impressed by the trials and simulations that Stäubli organised at their Telford facility and their interest in ensuring that the robot's advantages were maximised by PRP. This significantly reduced the degree of uncertainty for a small company in what was for them a sizeable investment and a first venture into robotics.

Initially one manufacturing cell was to be automated; a Stäubli RX90 robot with CS8 controller was selected and installed early in 2004. Cell 1 was based around an Arburg 270S and produced mainly standard products in PVC and TPE. Following the success of this first cell a second cell was automated early in 2005; Cell 2 was based around an Arburg 320S and produced more complex custom parts, often with two components being moulded in one tool. In both Cells the movement sequence started with demoulding, continued with separating the sprue from the component and placing the components, correctly orientated or separated, on the exit conveyor and finally placing the sprue, in most cases directly into a granulator for in line reprocessing.

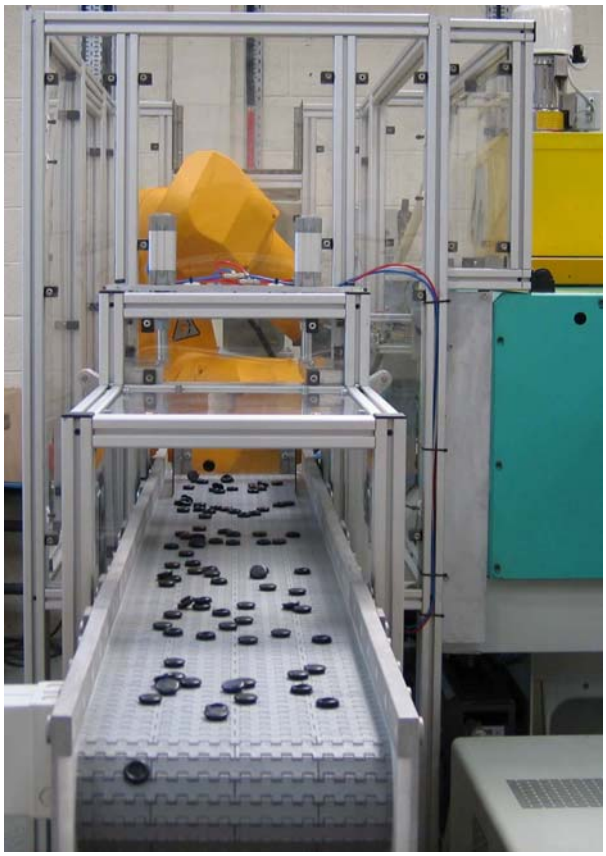
Space was a restriction for both cells, since PRP did not want to reposition the IMMs the automation had to be compact enough to be positioned between the adjacent machines and still allow access for personnel. The small footprint and compact design of the RX90 proved a significant advantage.

A Stäubli RX90 six axis robot servicing an Arberg 270S injection moulding machine at PRP Polymer Engineering

This performance is typical of RX robots; they are ideal for fast, accurate and meticulous types of tasks. They feature high speed and acceleration with the precise control to follow complex trajectories at joint speed ranges up to 1125degrees per second. At the heart of each RX robot is the patented, unique, JCS gearbox providing zero backlash, smoothness in movement and consistent, reliable performance. The movement in 6 axes provides an extremely large work envelope on a compact footprint.
RXplastics robots are available in three models (RX60, RX90 and RX130) with load capacity up to 25kg and a maximum reach at the wrist of 2185mm.

The robot systems were installed by Geiger Handling, Eccleshall, Staffs, who also wired in the Euromap box. PRP with their own tool room facilities designed and produced the gripper systems for the robot arms. Since the initial installation PRP have become skilled at reprogramming the robots themselves, having attended the training courses that Stäubli organise regularly at Telford. They now have two skilled staff members that are confident in changing, adapting and creating new robot sequences to accommodate new products or changes in component design. Robot sequences have even been programmed for runs of only a few thousand components, PRP are determined to make full use of their investment in automation.

Both cells have performed perfectly and are operating beyond the target rates set. The flexibility of the robot systems has enabled PRP to extend the range of products that are produced, incorporating second operation activities such as automated sorting into the robot's sequence that would have been difficult to cover manually.



The second robot cell at PRP Polymer Engineering serviced by a Stäubli RX90 six axis robot

MD, David Wilkins summaries PRP's investment in robotics, "We would now choose six axis robots for all our automation, their versatility and ability to be easily reprogrammed, coupled with very reasonable payback periods, have been major benefits to us as a smaller manufacturer, the experience and advice from the Stäubli team really smoothed the path for this development."

Many injection moulders are standardising on Stäubli for all their automation requirements. They are realising the benefits that flow from a comprehensive understanding and appreciation of the wide-ranging capabilities of these highly developed machines. New model introductions such as the 6 axis TX range in 2004 and the acquisition in January 2005 of Bosch SCARA robots ensures that the changing demands of the marketplace continue to be fully reflected in the range and capability of robots available from Stäubli.

Stäubli is an international family owned group founded over 100 years ago in Switzerland employing over 3500 world-wide. Robotic production is centred south of Geneva in the French Alps, with facilities across Europe, North and South America and the Far East, the UK base is in Telford.

For additional information contact:

Mr. Paul Stone
General Manager
Stäubli UK Ltd.
Lodge Park
Hortonwood 30
Telford
Shropshire
TF1 7ET
Tel: 01952 671917
Fax: 01952 608579
E-mail:ukrobot@staubli.com
Website: www.staubli.com

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