

Stäubli robots increase productivity by 33% at Simpson Strong-Tie

Two Stäubli RX90L six axis robots, manufacturing construction connectors at Simpson Strong-Tie, have improved productivity by 33% and provide a useful additional degree of flexibility to the production line at their Tamworth factory.

Modern house building techniques increasingly call for factory assembled roof and flooring modules to minimise construction time 'on site' and reduce the requirement for skilled carpenters. Construction and installation of the modules is where Simpson Strong-Tie and their range of timber to timber and timber to masonry, steel connectors are required. They are the largest manufacturer of these products in the world.

Strong-Tie set up their European HQ in the UK in the mid 1990's and following several acquisitions moved to their current purpose built location at Tamworth in 1998. They now employ 120 and with a turnover of £21million are UK market leaders.



The robotics cell at Simpson Strong-Tie operated by two Stäubli RX90 robots

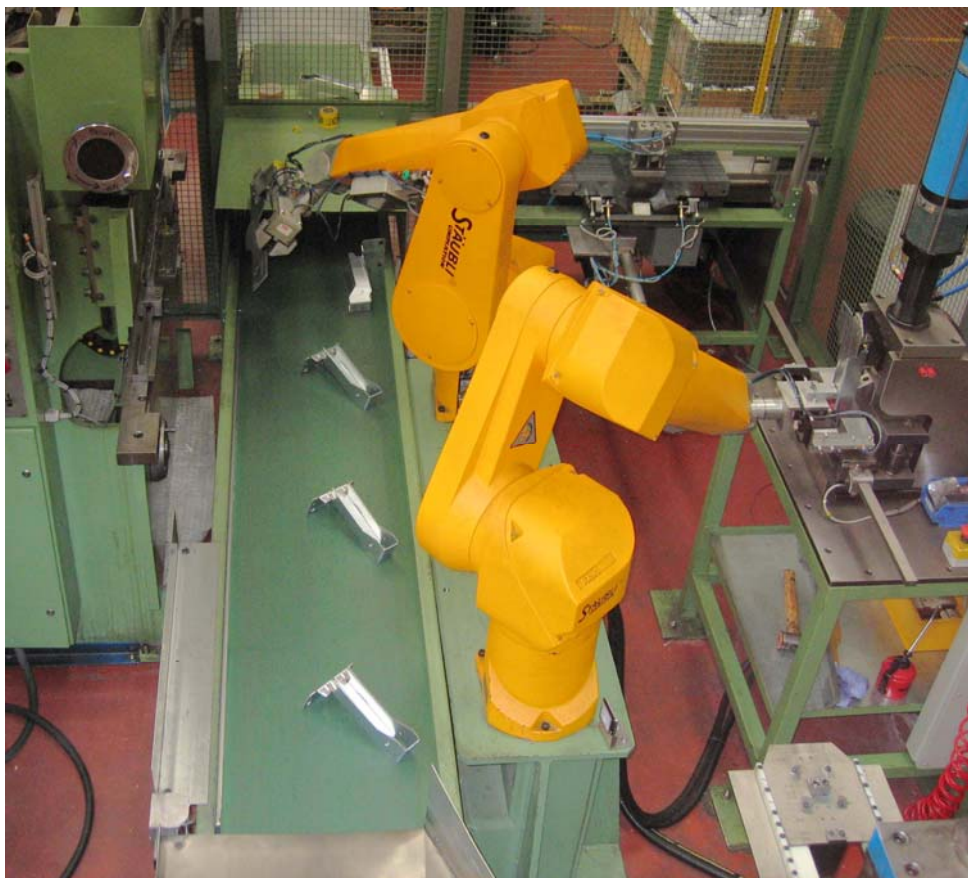
High volume production of the steel connectors is by transfer press where the feed stock of galvanised steel coil is formed sequentially into the finished product. A separate, manually feed, pressing and forming section produces the lower volume requirements from pressed blanks, typically in batch sizes of

4000 or less. Each manual section requires 4 operators - 3 working the pressing and forming machines and one packing the final product.

John Phipps, Director of Operations at Strong-Tie, comments, “We wanted to evaluate automating these manual operations to reduce manning and improve throughput. We had no experience of using robotics in this factory so called in Stäubli to advise.”

Stäubli’s technical team worked with Strong-Tie to identify the key operational parameters of the proposed robotic cell, the expected throughput, volume and range of products to be manufactured, space available in the cell etc. The cost effective solution recommended was a cell containing two RX90L six axis robots that had the reach and capacity to move the product between the pressing and forming units as well as the dexterity and precision to orientate the feedstock and present the work correctly to each processing stage.

The first robot picks up the cut and profiled steel blank from the input conveyor, presents it to the press to form the main flange and then transfers it to the second operation, a ‘V’ form bend. The second robot then takes over, it picks up the work piece and presents to a third station to form the top flange, subsequently placing the finished product on the output conveyor. The cell operator inspects and packs the product.



Stäubli RX90 robots work in tandem in the manufacturing cell

Strong-Tie required a turn key solution so Stäubli brought in Luma Automation of Worcester to integrate the two robots with the manufacturing plant and deliver a fully programmed, ready-to-run, manufacturing cell.

The cell was installed in 2004 and has performed beyond expectations. One operator now controls the complete cell in place of 4 previously, a significant saving on the 2 shift system that Strong-Tie operates. Phipps comments, “The robots operate fast, accurately and reliably; we are now considering locating the robot cell at the end of our main press line and extending the robots sequence to include packing the product, which will bring additional savings.”



Completed joist hangers leaving the Stäubli Robotics cell

The cell mainly produces masonry supported joist hangers and ‘safety fast’ masonry restraint hangers. Around 100 different products are produced in the cell. The robots’ software for all of these is pre-installed and they can cope with much more. Developments in the use of engineered wood joists are continually calling for new sizes of hanger, these can now readily be produced in the robot cell in the smaller initial quantities required at a fraction of the tooling cost associated with setting up a new product on the main presswork line. This is allowing Strong-Tie to respond quicker to their customers’ needs for new products without major investment in presswork tooling for a product that may not take off – the robot cell gives this useful added flexibility.

Simpson Strong-Tie, in common with many manufacturing businesses, require a 2 year minimum payback period for any investment to even be considered. The robot cell achieved payback in less than 1 year and has added to the flexibility of the production facilities at Tamworth resulting in a lower cost base and better customer service.

RX Robots

Stäubli RX robots feature high speed and acceleration and are capable of following complex trajectories even at high speeds. The high degree of accuracy and repeatability make the RX ideal for the performance of detailed, meticulous tasks. At the heart of each RX robot is the patented, unique, JCS gearbox providing zero backlash and consistent reliable performance. The RX range is compact, having a minimal footprint and is suitable for floor, wall or ceiling mounting. The range includes models with load capacities up to 180kg with a reach at the wrist up to 2831mm. The movement in 6 axes provides an extremely large work envelope. User friendly control software permits easy programming as well as re-programming to bring the added degree of flexibility often of benefit in automated systems.

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.

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