

# Integrated welding cell from ABB helps major agricultural machinery manufacturer to cut production times by two-thirds

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ABB FlexArc integrated cell helps Shelbourne Reynolds to cut production times and expand its manufacturing capabilities

An ABB robotic welding cell is enabling agricultural machinery manufacturer Shelbourne Reynolds to dramatically reduce production times for its range of articulated hedge cutting tractor attachments. Handling the several hundred welds entailed in the production of the attachments, the cell has so far cut welding process times by 66 percent compared to the company's previous manufacturing process.

The installation features a specially adapted version of ABB's FlexArc cell, which brings together a robot, positioner and the welding equipment needed for the process into one integrated package.

Installed as the latest step in a drive to automate Shelbourne Reynolds' Suffolk factory, the cell is used to handle the company's more difficult and time-consuming welding tasks. As well as the hedge cutting attachment, the cell is also used to produce other equipment, including a grain stripper and subassemblies for combine harvester headers, both of which involve complex welds.

"The decision on which tasks to automate with the robot was based on the amount of time they took compared to our existing process and the potential savings that could be achieved," explains Michael Scarfe, Manufacturing Manager, Shelbourne Reynolds. "For this reason, we introduced a cut-off point whereby anything that previously took an hour or more to weld was allocated to the robot cell." With the assistance of ABB, a time study was conducted with estimated time savings being identified for various welding processes in order to identify the ones best suited for handling by the cell.

The result has been a significant reduction in welding times, with products now being welded in one-third of the time previously required. Not only that, but complex welds, such as those involving welding around pipes and tubes, are now performed to a much higher aesthetic standard than previously.

"Circular interpolation processes involving welding around tubular objects can be a challenge for even the most skilled manual welders, particularly when time is of the essence," says Mr Scarfe. "The robot cell is able to handle these processes at a much faster rate, producing consistently strong, high quality and visually pleasing welds."

For Shelbourne Reynolds, a key benefit has been the freeing-up of the manual welders who previously made the products now being produced by the cell.

Compared to the previous team of six needed to handle the welding process, the robotic cell now only needs one team member to supervise one of two production shifts.

"It would be true to say that some of the team were understandably apprehensive when we first introduced the idea of a robotic welding cell," admits Scarfe. "However, the idea was always to use it to complement, not replace, our manual operations."

Proof of this is demonstrated by the fact that no-one has been made redundant since the cell was

introduced. Instead, workers have been redeployed to add value to other production processes, including fast turnaround tasks and those which are too large for the cell to handle.

Comments Scarfe: "Finding skilled staff is very hard, particularly when it comes to processes such as welding and plating. We are therefore very keen to hang onto the people we've got and to find ways to utilise their expertise in the manufacture of other products."

One example is the manufacture of the Stripper Header used on larger combine harvester vehicles, which, at 42ft in length, can be produced more economically by manual welders than a robotic cell.

"As a small manufacturing operation with limited production space, we need to have maximum flexibility in our operations and to make best use of the facilities we have available," says Scarfe. "Having a combination of automated and manual production facilities really gives us the best of both worlds; the robotic cell gives us fast, accurate automated production in a compact footprint, whilst our skilled manual workforce enables us to produce high quality welds on our other products where using a robot is not practical."

To enable Shelbourne Reynolds to get the most from the cell, ABB provided in-house training for two of the company's manual welding team, including guidance on operating and programming the robot.

"Our two team members who've been trained in operating the cell have really taken to their new role, says Scarfe. "Moreover, their expertise and knowledge of welding processes has been invaluable in helping us to get the most from the robot cell. Far from being wary of the robot taking their jobs, our team have been actively looking for new ways in which it can be used."

The benefits brought by the robotic cell have also had knock-on effects on other areas of the business, including the way that new products are being designed. After being shown what can be achieved with the cell, the company's design team has started to design its products to make them more suitable for automated production. One example includes the 'strongbacks' used in the manufacture of the hedge trimmer and the other products which have been transferred to the robotic welding cell.

"Our long term aim is to introduce another cell to help us further expand our production capabilities," explains Scarfe. "For now though, we want to find as many ways to use our existing cell as possible. We've already got five products on it and want to keep adding more until it is fully utilised 24/7. The Flex Arc cell is ideal for short batch manufacture with quick fixture changes, making it an ideal match with our Just-In-Time (JIT) manufacturing and reduced inventory philosophies."

A passionate advocate of automation, Michael Scarfe is no stranger to robotic production, having been involved in robotic welding production projects from car seat manufacture in the early 1990s to more recently electron beam welding of turbo chargers.

Says Scarfe: "I have always been interested in finding new ways in which robots and automated equipment in general can be used to shave time and cost off the production bottom line. As robotic automation projects can often be quite involved, it's also good to work with a supplier that can help at every stage. I have worked with various robot suppliers in the past but have rarely received the same degree of openness and assistance that I have received from ABB in this recent project."

ABB helped to play a key role in optimising the cell's performance from the outset. Using ABB's RobotStudio software, a simulated version of the cell was created which enabled programming and testing to be performed in an offline environment. This reduced much of the set-up time when the actual cell was assembled on site, allowing Shelbourne to commence welding operations within just three days.

The installation is also supported by an ABB remote service technology. This technology sends data on the robot's performance remotely to ABB via GPRS technology. The information can then be stored and used for reference, and alarms can be directly monitored. Trends can also be spotted before problems become evident.

In the event of a problem, an SMS message is automatically sent an on-call service engineer, who can immediately access a detailed data and error log and quickly identify the exact fault.

For more information about ABB's FlexArc welding cells or remote service technology, call 01908 350300 or email [robotic@gb.abb.com](mailto:robotic@gb.abb.com).

