

Sparks Fiberglass

Innovation and Experience – arguably two of the most important factors in determining whether a company will succeed or fail in today's business world.

The addition of a robotic workcell into a production line can have a dramatic effect on an organization. For Sparks Fiberglass, Inc., located in Rock Island, Illinois, the addition of a robotic cutting and trimming workcell improved their overall production and delivery time, but also decreased environmental and health hazards. The workcell has not only changed their processes, but has changed their business.

History

Sparks Fiberglass opened their doors in 1988 when Gary Sparks, and his wife Jan, made the decision to open a fiberglass boat repair business along the potentially profitable banks of the Mississippi River. Over time, employees were added as the business began to grow, prompting the Sparks to relocate to a larger facility.

Gary and Jan quickly learned that the fiberglass boat repair industry was seasonal, and began looking for additional opportunities. Early production opportunities included fiberglass parts for the home-built aircraft industry, full size flight simulator shells, and various custom molded projects. As production grew, they rented additional off-site space near their facility.

A potential niche market emerged in 1998, when Sparks Fiberglass received their first order for 50 fiberglass antenna covers on cellular phone towers. Manufacturing antenna covers fit the Sparks manufacturing process and capabilities, but it was very labor intensive. Each antenna measured up to eight feet long and required hand processing, which included trimming, routing, and drilling. Even though it was a great opportunity, the Sparks had concerns. “We had a few sleepless nights wondering how we would get them built and trimmed. The work was messy, dusty, and repetitive,” recalls Jan.

This initial order, however, kicked off great growth for Sparks Fiberglass. Escalating production levels made space an issue, so in 1999 the Sparks decided to move operations to their current 20,000 square foot facility in order to accommodate the increasing demand. Although their business was going well, they were concerned about their processes. ‘We knew the trim and drilling part of our process was the weakest link. The size and flexibility of the covers, combined with hand trim sawing and drilling required constant monitoring of product quality and produced unacceptably high rework rate. To solve this, we began discussing how to improve it. We would jokingly mention that it would be great to have a robot to do the work – always saying it was a ‘dream,’ says Jan.

The company began to search for options to replace the hand finishing processes and improve the production of the antenna covers. After speaking with other system automation companies and not getting the results they were looking for, Gary and Jan noticed an advertisement for Genesis Systems Group, LLC., in Davenport, Iowa and gave

them a call. Genesis went to work on developing a system solution that would meet or exceed the needs and expectations of Gary and Jan.

The System Solution

After a few concept designs were created and discussed, designers and engineers at Genesis, working in tandem with members from Sparks, were able to develop the right system for the fiberglass company. The workcell was designed to trim, drill and route fiberglass antenna covers as well as other miscellaneous fiberglass parts. Throughout the project, Genesis had several goals to keep in mind.

- To improve the consistency of the antenna covers.
- To ensure that the end customer remained satisfied with the products Sparks delivered.
- To improve environmental conditions for employees by removing people from the dangerous procedures and processes involved in manually finishing the covers.
- To decrease rework rates.
- To greatly improve productivity without increasing costs.

The resulting system included a Fanuc R2000 six-axis robot with a 10 hp spindle motor mounted to the arm. The robot was designed to process parts on two 120-inch tables positioned on either side of the robot. Each table was tapped with a series of holes that were positioned every six inches to allow flexibility to accept different fixtures as new processes were identified.

The workcell features an automatic tool changer and six tool holders to accommodate the necessary saw blades, burrs, router bits and drills. The robot automatically picks up the appropriate tool for each specific process. When it is time to change tools, sensors automatically verify that the tools are present. In order to maximize the efficiency of the machine, the workcell was designed to allow an operator to load and unload one station while the robot works on the other station, thus maximizing the robot cutting time. The workcell was programmed to first drill the mounting holes in the antenna covers, then clean up and smooth out the edges by trimming and routing. The operator uses the teach pendant to select the specific part to be run. Once in motion, the process time ranges from one to three minutes depending upon the part number. According to Gary, 'it was a little disorienting when first getting the robot, due to an unexpected 10:1 gain in production. What used to take three days to produce by hand can now be accomplished in one day with the robot'.

The new workcell was installed at Sparks in January of 2002. Once installed, employees from Sparks were trained to operate and program the workcell. While Genesis Systems Group provided the programming for three different antenna covers; Gary and his staff used their knowledge and experience to design the tooling and create new ways in which to take advantage of the systems capabilities. The design of the workcell provides for flexibility that enables Sparks to use the workcell for other jobs as well.

Productivity Skyrockets

With the addition of the robotic system from Genesis, Sparks is on track to produce and finish approximately 36,000 fiberglass antenna covers this year, a twelve fold increase from the 3,000 antenna covers produced annually prior to getting the workcell – all while maintaining the same number employees. They've also gained new customers with requirements for drilling and trimming, and plan to add another robotic workcell within the next year.

Both Sparks and Genesis have been pleased with the results. “This was by far the best decision we have ever made,” says Jan. “We can now produce 100 different styles of fiberglass covers, and each is finished with consistent quality and speed. The robot doesn't take breaks, eat lunch or call in sick.”

About Genesis Systems Group

Genesis Systems Group LLC., is an industry leader in the design, manufacture, and building of robotic systems for welding, cutting, material removal, material handling and custom applications. The company has installed more than 2,000 automation systems in more than 36 states and seven countries.

For further information on Genesis Systems Group visit www.Genesis-Systems.com or contact robots@genesis-systems.com