Prototype to Part

DIXON CONNECTS WITH 3D PRINTING

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– Rodney Everett, Jr.,
Dixon Valve & Coupling Company

CASE STUDY

Dixon gaskets are inserted into these fittings using a SCARA robot and 3D printed grippers.

A NEW AGE OF MANUFACTURING

“The Right Connection,” is an apt tagline for Dixon Valve, given its positioning in the hose coupling industry. Dixon might not have guessed it would be equally on point in terms of the company’s use of 3D printing. A number of years ago, Dixon instituted an Advanced Manufacturing Engineering Department to address the workings of their automated and manufacturing equipment. “We saw an opportunity to improve our efficiency by using 3D printing to rapidly develop functional prototypes for our gantry systems,” said Rodney Everett, Jr., industrial engineer. The team recommended 3D printing and the rest as they say, is history. The additive process’s ability to print custom manufacturing aids critical to tooling has become an important part of the company’s production process and has left engineers at the century-old company embracing the future of manufacturing with 3D printing.

“When we develop a new part for our customers we also have to create new tooling to aid in the manufacturing of the part,” said Everett. Prior to their first 3D printer, the company used conventional manufacturing methods to produce new tooling. “We produce hundreds of these parts. We now use 3D printing to rapidly and efficiently produce a variety of tools that aid in the manufacturing process,” said Everett. One of the benefits of using 3D printing is that the cost is related to the exact amount of material needed, rather than the complexity of the design.

Behind-the-Scenes Workhorse

The Advanced Manufacturing Engineering Department introduced the Stratasys Mojo® 3D Printer to operations and quickly garnered proof of concept for printing of its gantry locators that allow robots to reliably load parts. Due to 3D printing, Dixon has reduced both the material and the labor costs of producing the gantry locators.

The next step was passing the technology on to its tooling department to print fixtures and jaws. Gantry locators and fixtures and jaws continue to be Dixon’s two 3D printing mainstays. “We found we could improve our manufacturing support by incorporating 3D printing,” said Everett. We have used 3D printing to reduce the cost of manufacturing.

Dixon wasn’t looking to produce production parts via 3D printing, but they wanted a product that could stand up to repeated use on the production floor. “The big difference between rapid prototyping and production-grade parts is reliability and strength,” said Everett. “The Mojo provided a balance between economical printing and structural strength. We’ve combined rapid prototyping with production. The Mojo does both.”

Adding to their success using ABS-M30™, engineers at Dixon added FDM Nylon 12™, which enabled the printing of permanent parts. “Gantry locators and fixtures alone quickly justified our further investment in 3D printing,” said Everett. “We save 88% in time and cost by using 3D printing versus standard manufacturing. Labor is a significant expense and our cost is dramatically reduced now.” Once Dixon upgraded to a Fortus 380mc™ with its greater production capabilities, the company could also print their very specific-angle elbow parts. Quick turnaround for these unique parts is another added value of 3D printing, according to Everett. “Suddenly we could go from idea to design to part all within 48 hours.”

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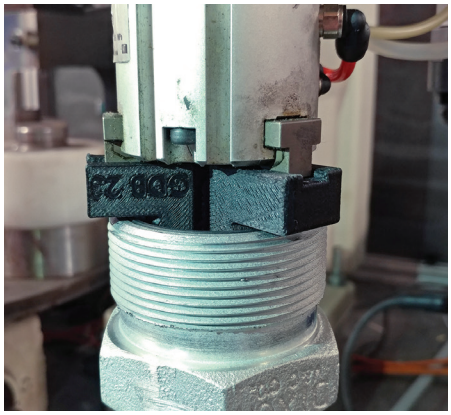
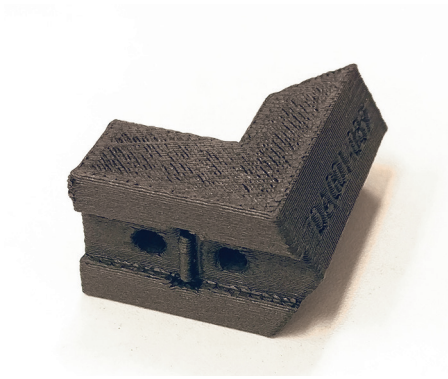


Dixon part held in place by 3D printed grippers that maximize the gripped surface area, creating a stronger holding force.



The fine resolution on the Fortus380mc allows printing of small locating features like the vertical bar on the bottom of this gripper.

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