Rutland Plastics

Use Case – End of arm tooling and in-house jigs and fixtures

Customer Profile

Located in Rutland, United Kingdom, Rutland Plastics is a family-owned custom injection moulding company that produces products for a wide range of customers and industries. Because each project is unique, Rutland must create complementary jigs and fixtures to position and hold the project's components during manufacturing processes like assembly, gluing, drilling, and measuring. Although additive manufacturing has been in use on-site for some time, the company invested in Stratasys' FDM solutions only a few years ago.

Challenge

Historically, manufacturing jigs were produced in the on-site toolroom using traditional materials (aluminium etc.) and methods. This process was time-consuming, expensive, and produced heavy parts. Post-processing would require multiple stages, including turning, milling, drilling.

Alongside this, the major issue for the team was the durability of the parts. Previous 3D printing technologies would produce parts that had poor strength and were very brittle, which meant the jigs would shatter if accidentally dropped. To counter this, a conventionally machined end of arm tool would need to be five or six times thicker – leading to weighty parts. Furthermore, end of arm tools made in the toolroom using the same machining methods would be very hard and drawn-out to create with the required geometries and shapes, normally taking days, and the robotic hand itself would be heavier.

The team needed to find a way of producing strong and robust parts via a less time-consuming process.

- Projects historically produced in the toolroom would be time-consuming, often taking up to two days to produce parts, which impacted upon factory productivity
- End of arm tooling regularly requires complex geometries and increased thickness to meet performance requirements and function effectively
- Traditionally machined parts are heavy and cumbersome. Heavy parts on a robot arm significantly reduce the amount of payload the arm can carry

Solution

Using its industrial-grade FDM-based Stratasys 3D printer, Rutland Plastics can produce parts with the required durability to replace traditional metal tools. The company has now fully incorporated the solution, in conjunction with FDM materials, as the backbone to its tooling and production line operations, specifically for end of arm tooling - reducing any hinderance to overall factory productivity.

- The cost of producing parts has now been reduced by 50% in comparison to traditionally machined parts, which can also be produced overnight
- Stratasys' high-performance Nylon 12CF material offers the strength needed for production, while ASA material is ideal for the manufacture of higher precision jigs and to replicate plastic parts
- Parts are now lighter and less cumbersome without sacrificing strength and rigidity. Robotic arms are not hindered when carrying heavy payloads as carbon fiber produced parts require less thickness.

Impact

Additive Manufacturing with the Fortus 450mc and F170 3D printers enabled Brown & Holmes to produce the laser drilling fixture in 4-5 weeks. Traditional manufacturing would have taken up to 12 weeks. Additionally, Brown & Holmes was able cut production cost by half compared to its conventional manufacturing methods.

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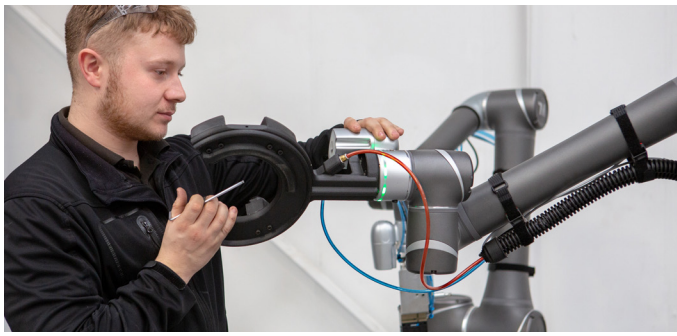

Using Stratasys FDM 3D printing, parts are now lighter and less cumbersome without sacrificing strength and rigidity. Robotic arms (as pictured) are not hindered when carrying heavy payloads as carbon fiber produced parts require less thickness

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