



Faster, Lighter, More Cost-Effective

Form Automation Ltd, established in 2001 and based in the UK, specializes in robotics. Its mainstay, pick and place machines, are essential for the food packaging industry and are used worldwide, from the UK to Australia. Its robots need to run 24/7, which means that any unforeseen machine issues can be costly.

For end-of-arm tooling, replacement in the event of breakage is both laborious and time consuming and can result in unwanted production line downtime. In search of a solution, the company turned to Stratasys® UK Platinum Partner, Laser Lines, based in Banbury. Initially focused on prototyping work to improve the designs, Form Automation was so impressed with the speed and strength of the 3D printed prototypes, it decided to invest in its own in-house 3D printing capability to make production line tooling. Now, the team relies on the Stratasys F370™ 3D printer to quickly and cost-effectively produce replacement end-of-arm tools for its network of robots.



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A 90% part reduction now means that instead of taking 50 minutes to repair the robot's end-of-arm tool, we can now do it in just two. The impact this has on production line downtime is invaluable.”

Martin Grisdale

Company Director, Form Automation Ltd.



Improving the Production Line

It is essential for these robots to run efficiently and continuously, which means that if any end-of-arm tools become damaged, the team would face setbacks that could take hours to resolve. Traditionally, the tools are produced in aluminum, with part production outsourced to an external company.

“The end-of-arm robot tools are complex, and if any part of the stem gets bent, the whole tool is out of action,” explained Martin Grisdale, Company Director, Form Automation Ltd. “Replacing an aluminum part would have incurred significant delays to the production line. Thankfully, with the F370, I can now have a new tool within just a few hours. Coupled with that, the cost to produce 3D printed end-of-arm tools is less than that of producing the same parts in aluminum.”

Produced using Stratasys’ flexible TPU elastomer, the 3D printed stem is more than 50% lighter than a conventionally-produced aluminum part — resulting in better machine performance.

“As the 3D printed version of this tool is much lighter, only one engineer is required to refit the replacement tool to the machine,” Grisdale said. “The reduced weight also improves the efficiency of our robots, which can now run at much faster speeds thanks to the lighter tools.”

The company has also seen a reduction in the frequency of damage to the end of arm tools, the stems of which would previously bend or snap easily. Thanks to the resilience and flexibility of the TPU material, this is now a much less frequent occurrence.

“The TPU material has enabled us to create a part that works with the machine, where the aluminum stems would bend or snap, the 3D printed part is flexible yet extremely tough,” Grisdale explained. “We don’t need to worry about it breaking as frequently, or the damage this part might cause to other parts of the machine with which it comes into contact.”

Lightweight Stratasys 3D printed end-of-arm robot tools comprise only two individual parts, resulting in 50% lighter parts and a reduction from fifty minutes to two in refitting the robot.



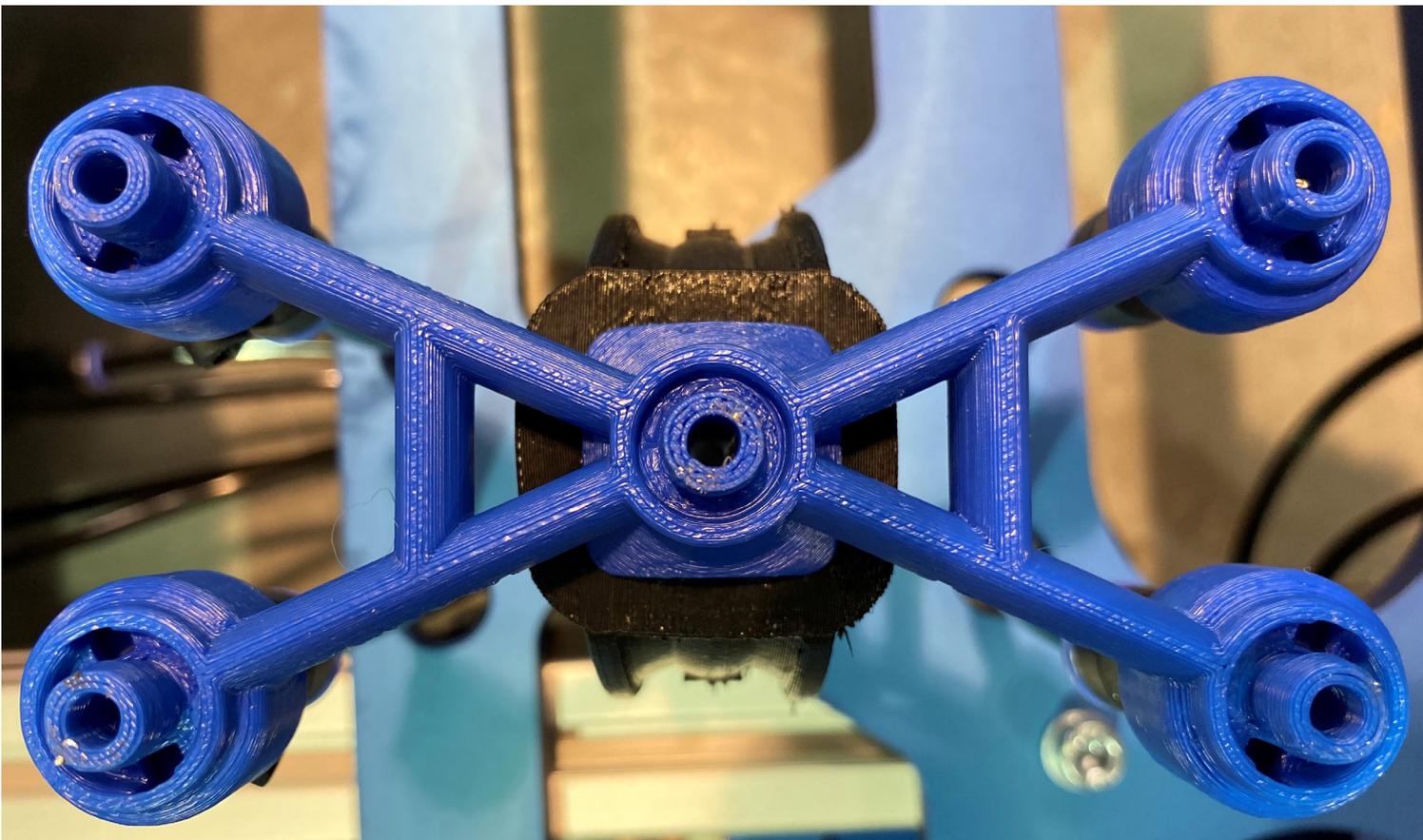
Complex Design Simplified

For Form Automation, one of the biggest challenges in manufacturing its end-of-arm robot tools was the sheer number of parts that comprised each one. When produced traditionally, the tool was made from 20 individual, intricate and often hard to assemble pieces.

With Laser Lines' help, Form Automation began to rethink the design of these parts. The freedom afforded by additive manufacturing enabled the team to overhaul the design completely. Using GrabCAD Print™ software, a more simplified design saw the 20 individual pieces reduced to only two — a dramatic reduction of 90%.

A 24/7 robot needs a 24/7 technology and having the F370 in-house means that the team can complete the job, even when they're not on site.

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