APPLICATION SPOTLIGHT

End-Use Product

	Time	Parts
Traditional	30 days	800
Markforged	9 days	70
Savings	**70%**	**91%**

Haddington Dynamics is the company behind the low-cost, open-source, 7-axis Dexter robotic arm kit.

Challenge

Robotic arms need to be cost-effective and stiff enough to maintain 50-micron precision in the arm's movements.

Solution

A fleet of several Markforged printers allowed the team to develop durable, custom gripper fingers for customers.

Results

Haddington Dynamics reduced part count from 800 to under 70 and can assemble Dexter robots within a day.

3D Printed 7-Axis Robotic Arm

Dexter manufacturer Haddington Dynamics supplies its 7-axis fully assembled robotic arms and kits to NASA, GoogleX, and Toshiba. After using the arm, a high-profile customer suggested they move away from using weak PLA material and instead utilize Markforged's Onyx material with continuous carbon fiber reinforcement to achieve the strength they desired. This was enough for Haddington Dynamics to purchase four Markforged printers. Inventor of Dexter, Kent Gilson said "within about three weeks of receiving our printers, we had completely redesigned the robot with the carbon fiber layup and saved all kinds of volume." Dexter is now almost completely made from Markforged 3D printed parts, which has saved the company 58% in costs.

Haddington Dynamics' customers receive custom swappable 3D printed gripper fingers with each robotic kit. Dexter's modular end effectors are capable of pick and placing, gripping, 3D printing, and even working with CNC machines. Due to the reduced manufacturing time and cost, Haddington Dynamics is able to pay off a Markforged printer with the production of a single Dexter robot. "You recover your ROI in a single output, which changes the manufacturing model," said Todd Enerson, CEO at Haddington Dynamics.

+ Consolidated Assembly

Continuous carbon fiber reinforced plastic allows for strong, complex parts, reducing the number of pieces needed in assemblies across the production cycle.

+ Tolerance Accuracy

Markforged's cloud software ensures parts come off the build plate with an accurate size and structure, leaving no surprises.

+ Professional Surface Finish

Haddington Dynamics can take a Dexter straight off the printer and ship it to their end-customer without any post-processing.