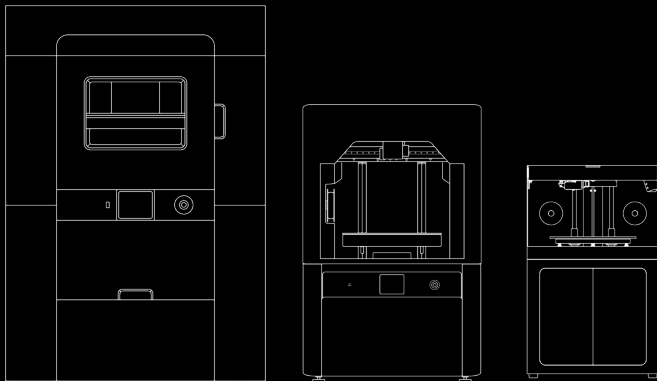


# Production End-of-Arm-Tooling

Food and Beverage/Packaging Industry  
Additive Manufacturing Application Spotlight



Industry: Food & Bev / Packaging  
Application: Production End-of-Arm-Tooling  
Technology: FX20™, FX10™, X7™  
Materials: Onyx®



# End-of-Arm-Tooling

Having on hand the right solutions to address the rapidly multiplying SKUs and frequently refreshed packaging now common to the Food Manufacturing Industry can be a frustrating challenge for manufacturing teams. How can teams squeeze more performance and agility out of each line, when the equipment used last month isn't compatible with the packaging of the version launching next month? How can faster changeovers be accomplished to meet mixed packaging and demand-driven supply chain agility? Production-ready additively manufactured (AM) EOAT allows teams to consolidate and customize end-effector solutions, while also reducing costs and lead times.

Markforged's industrial composite 3D printers make it simple to fabricate strong parts on-demand at the point-of-need, avoiding the long development cycles and high costs associated with conventional custom part machining.

The ability to modify a design for lightweighting while maintaining metal-like strength with continuous fiber reinforcement also opens up the opportunity to customize designs to add further functionality. Other functionality such as vacuum systems, sensor

mounting, and cable routing can be incorporated into the design of the additively manufactured EOAT part itself. Integrating these elements also minimizes the chance of entanglement or collision with other parts of the work environment, ultimately reducing potential downtime. Lighter parts are also compatible with smaller robots, allowing manufacturing teams to deploy an automation module to any position on the line using a collaborative robot.

The Digital Forge™ allows teams to keep the line running and produce the parts they need right on the factory floor.

- Design the custom parts needed to address challenges encountered on the factory floor.
- Achieve complex geometries in industry-grade materials such as Onyx® micro-carbon fiber-filled nylon.
- Create metal-strength lightweight composite parts using Continuous Fiber Reinforcement (CFR).
- And as the need recurs, the team can select an authenticated additively manufactured EOAT part from the digital inventory.



Custom Vacuum Grippers printed on the Markforged X7™

## Design Process

A suction gripper for a production line used in the final packaging step to transport the unit containers into the retail packaging box. As the distance between grips depends on the latest product and box shape, and by creating AM EOAT the manufacturing team is able to adjust the length on the fly to suit the latest requirement without adding excess weight. Fabricating the part in-house avoids delays waiting for the supplier to ship a custom part. As a result, producing parts with Onyx gives them faster parts, lowers the total cost, and decreases the weight (and thus load) on the packaging robot.



## ROI Highlights

1. Produce in hours instead of weeks required for conventional custom parts production.
2. Grow your digital inventory of solutions to further accelerate changeovers.

**“The logistical complexity of multiplying SKUs and demand-driven production balancing can be met right on the factory floor.”**

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