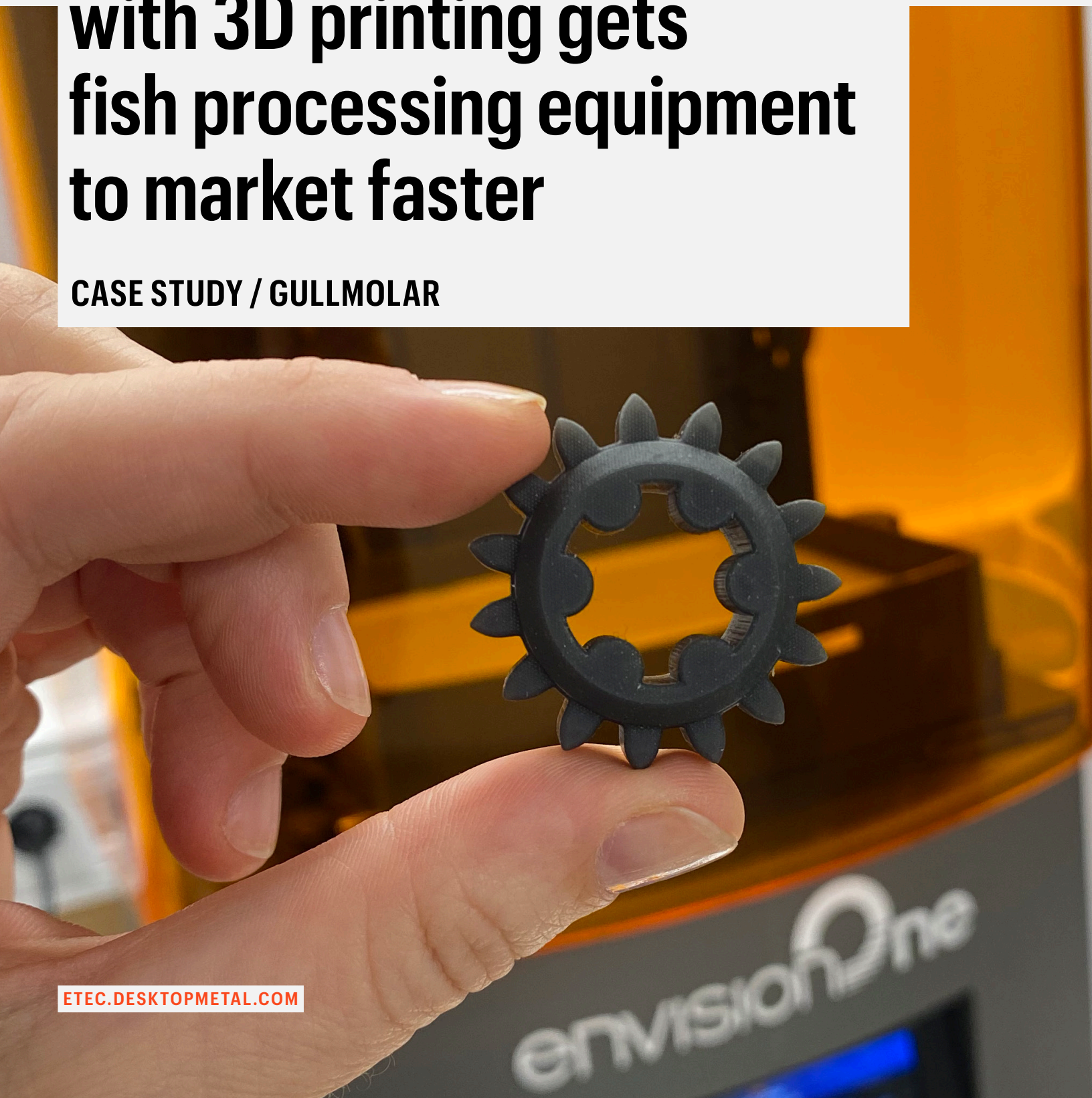
ETEC

Rapid product development with 3D printing gets fish processing equipment to market faster

CASE STUDY / GULLMOLAR



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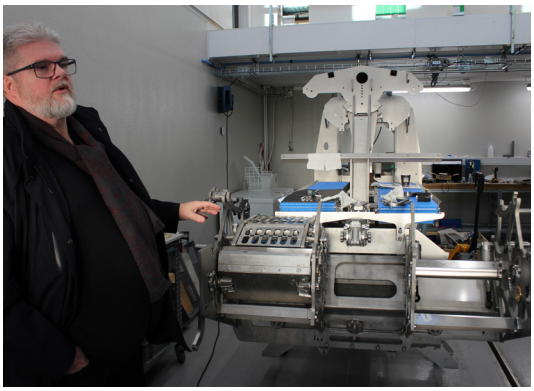
CASE STUDY FISH PROCESSING EQUIPMENT



ELLIÐI HREINSSON, FOUNDER CURIO & GULLMOLAR, WITH THE LATEST CURIO FISH FILLETING SYSTEM DEVELOPED WITH ETEC & DESKTOP METAL 3D PRINTERS

Curio Fish Processing Systems

Elliði Hreinsson founded Curio, a top producer of processing machinery for the heading, filleting, and skinning of fish. The company, was recently acquired by Marel (NASDAQ:MAREL), a global leader in the development and production of tools, complete solutions, software, and services for the food processing of chicken, meat, and fish. Hreinsson continues to provide 3D printed parts for Curio machines as an advisor and supplier to the company with his manufacturing company, Gullmolar.

CURIO FISH FISH PROCESSING EQUIPMENT GET TO MARKET FASTER WITH 3D PRINTED MOCK UPS, PROTOTYPES, AND FINAL PRODUCTION PARTS

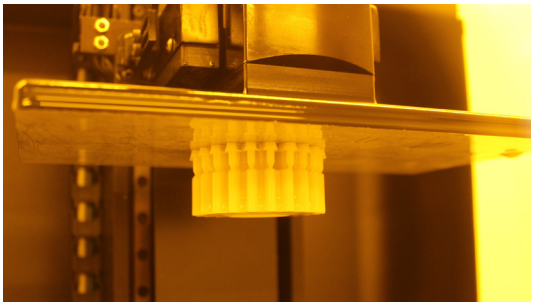
Adopting disruptive technology

One industrial fish filleting machine is a complex mechanical assembly of around 2,300 parts tailor made to process delicate food products with speed and efficiency. 3D printing technology from Desktop Metal and ETEC helps optimize Curio fish processing equipment by rapidly prototyping parts optimized to get the best results for the fish and quickly advancing those designs to batch production.

An early adopter of additive manufacturing, Elliði Hreinsson has been using plastic 3D printers for decades to create first plastic prototypes that allow him to hold a mockup of the part and test for fit and function when developing his food processing equipment. “We can create ‘zero-type’ parts without waiting for tooling and we’re not married to the design,” Hreinsson said.

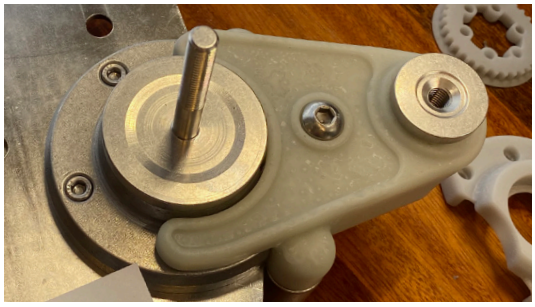
He began his 3D printing journey as many do, first investing in fused deposition modeling (FDM) machines over ten years ago. The systems were a great advancement for basic prototyping of singular parts, however the extrusion of thermoplastic filament was slow and the accuracy wasn’t always precise. “The parts were introductory. I found a way to use them, but I started looking at ETEC because of the faster speed and smoother surface finishes,” Hreinsson said.

On-demand isotropic prototypes



A COMPLETED 3D PRINT IN THE ETEC ENVISION ONE

HENKEL LOCTITE® MATERIALS FOR THE ENVISION ONE



AFTERMARKET SLICING ATTACHMENT IN TESTING

ETEC digital light processing (DLP) technology harnesses the power of light by projecting into a vat of photosensitive resin to cure a design layer-by-layer until the part, or multiple parts nested on the build platform, is complete. Processing an entire layer one quick flash at a time, DLP technology delivers smooth, accurate parts in a fraction of the time of technologies that trace out vector paths individually. And compared to the mechanical bonding between layers in the FDM process, the DLP curing method creates fully isotropic parts.

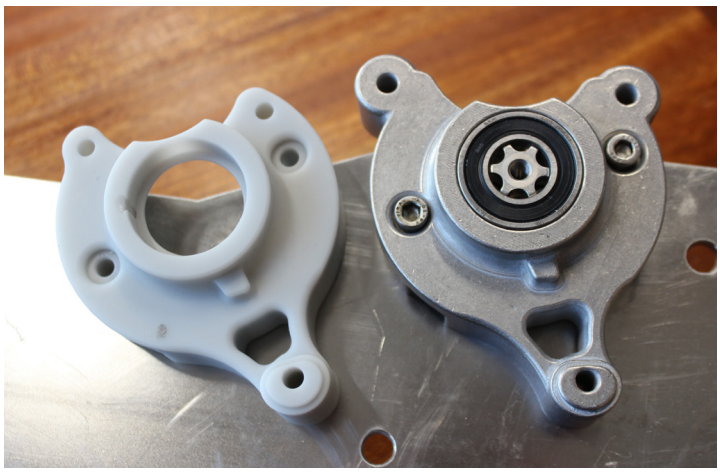
Not only does the FDM extrusion method result in a rough surface, it creates anisotropic parts, meaning the parts will have varying part propeties in different directions. With FDM, the parts are less strong in the Z direction due to the mechanical bond between the layers. For a product look and feel evaluation this may be acceptable, but was an issue for suitable prototyping performance. Hreinsson stressed, “The plastic parts from the ETEC machines are so good that you can test run some of them.”

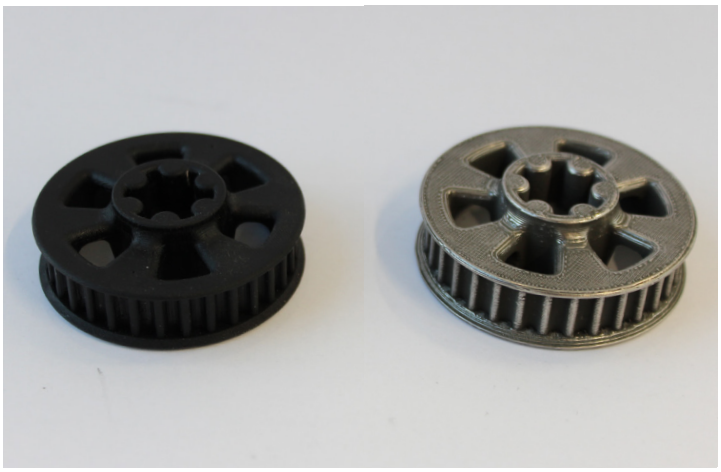
Investing in two Envision One DLP systems from ETEC allows Hreinsson to print designs on-demand to test for fit, functionality, and final manufacturability without any tooling investment.

3D printing has become essential for Hreinsson in the creation of Curio fish processing machines. “After designing the parts on the computer we need to build a first mockup. It’s not a workable system, but we need to make sure all the parts fit or that we didn’t forget anything,” he said. Seeing a built design allows him to evaluate where parts may butt into each other or see other potential issues that aren’t realized on a computer screen.

3D printing also helps Hreinsson customize his designs to meet the industry’s needs. “If we find out the customers would like to change something a bit, no problem, we can print out a new part and test it immediately to then produce production designs with a quick turnaround for better performance.”

Hreinsson admits the ability to prototype new ideas rapidly is an inventor’s dream. “When you start to develop a new machine and you have this in your toolbox, it’s always in your head and the designs take off from there,” he said, explaining his plans to harness the design freedom of 3D printing for continued performance improvement of fish processing equipment.





HREINSSON TESTS PLASTIC PROTOTYPES 3D PRINTED ON-DEMAND ON ETEC SYSTEMS BEFORE SCALING PRODUCTION TO DESKTOP METAL 3D PRINTERS

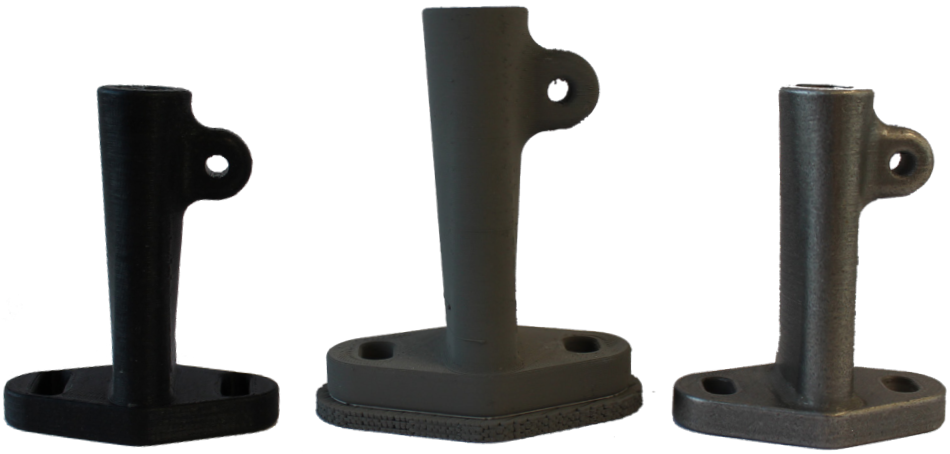
Competitive with technology

Hreinsson's manufacturing facility runs two ETEC DLP printers and five Desktop Metal Bound Metal Deposition (BMD) 3D printers around the clock. Plastic mockups are built on Envision One systems in a variety of materials, including E-RigidForm and Loctite® IND406. Both materials are known for an excellent surface finish, high strength, good heat deflection, and properties like water-resistance that make them durable for prototyping and testing during the design phase.

Designs are quickly advanced from plastic to metal 3D printing on the Studio System to get to first-model metal protoytpe parts fast. And with his metal 3D printing capacity, 316L stainless steel production parts are available as soon as a design is finalized.

Combining plastic and metal 3D printing for rapid development and iteration allowed Hreinsson to reduce the time to market of the latest Curio fish filleting system, the C-2034, by an entire year. And from roller flanges and conveyor joints to mounting brackets, housings, and swivel arms, the machine also features over one hundred end-use metal 3D printed components.

Bringing 3D printing technology in-house has allowed Curio to shorten its supply chain and prodive local manufacturing solutions. "I'm competing with Asia with technology," Hreinsson said.



3D PRINTED PLASTIC PROTOTYPES (LEFT) ARE TESTED BEFORE METAL 3D PRINTING A GREEN PART (CENTER) AND SINTERING A FINAL DENSE METAL PART (RIGHT)

About ETEC

ETEC is a leading global provider of professional-grade 3D printing solutions. Founded in 2002 with its pioneering commercial DLP printing technology, ETEC now sells more than 30 printer configurations based on five distinct technologies that build objects from digital design files.

The company's premium 3D printers serve a variety of medical, professional and industrial markets, and are valued for precision, surface quality, functionality and speed. For more information, visit www.etec.desktopmetal.com