



Sweet Spot

VISUAL FIRST HELPS CHOCOLATE FACTORY PREVENT BOTTLENECKS WITH ON-DEMAND PRODUCTION PARTS

“Additive manufacturing offers significant opportunities to decrease spare-part inventory, reduce the supply chain and slash costs. The ability to print a spare parts on-demand offers manufacturers a rapid solution that ensures production continuity and, most importantly, help safeguard revenues.”

– Carl van de Rijzen, Visual First

CASE STUDY



3D printed replacement machine part, produced in tough FDM Nylon 12CF thermoplastic.

Visual First, founded in 2006 by Carl van de Rijzen, provides visual communication tools using 3D printing and 3D visualization. Visual First uses 3D printing to help clients conceptualize their work and overcome design challenges before committing to costly tooling and production.

The Chocolate Factory, a Dutch candy maker since 1912, produces multiple chocolate products including the Dutch favorite Johnny Doodle. Faced with costly packaging bottlenecks due to lengthy lead times waiting for replacement parts, The Chocolate Factory needed a better solution.

The Chocolate Factory's complex packaging machines rely on the smooth operation of a simple, yet crucial, hook-shaped metal part that lifts wrapped chocolate bars onto a conveyor belt. Due to varying product sizes, the machines require regular adjustments, posing two challenges.

First, if the hook-shaped part is fed into the machine incorrectly, it jams and requires immediate replacement. Second, the constant need for human intervention and maneuvering of metal parts results in damage to the machine.

Carbon-Fiber 3D Printed Thermoplastic Replaces Metal Production Part

For Visual First, the requirements were clear. The Chocolate Factory needed a replacement part that was both strong and reliable, and could be produced quickly. Initially, Visual First tested several designs using SLS and SLA technologies. “Unfortunately, for the factory’s requirements, the first prototypes were not strong enough to withstand the force of the machine,” said van de Rijzen.

Visual First turned to high-performance Stratasys FDM Nylon 12CF™, a carbon-fiber thermoplastic. Produced on the Stratasys Fortus 450mc™ 3D Printer, the final 3D printed part’s high stiffness-to-weight ratio and extreme rigidity was exactly what The Chocolate Factory needed.

“The success of the part was instantly clear; the material is impossible to bend,” van de Rijzen said. “The part withstood all tests on the machine and multiple runs were completed without incident. The factory increased production throughput by replacing the metal machine part with our 3D printed version.”

Time and Cost Efficiencies

With machines requiring high levels of customization, the need for advanced material capabilities was not van de Rijzen’s only concern. The existing metal part was malfunctioning with such regularity it necessitated replacement three times a month. Given each part must be handmade using traditional means, replacing these via suppliers took over a month, a time frame that posed a huge problem for the factory team.

“Considering the essential role of this part, it is crucial that a spare part is available on demand to ensure the packaging machine is always operational,” said van de Rijzen. “With the Stratasys Fortus 450mc, we have a rapid, high-throughput solution that delivers highly accurate and repeatable results. As a result, the downtime on these parts is dramatically reduced. The Chocolate Factory can now have replacement parts manufactured and delivered in under a week, which is instrumental to its business continuity.”

The switch to 3D printed replacement parts resulted in significant economic benefits too, saving 60% on the part. “The ability to optimize the design with our 3D printer has improved the actual functionality of the part on the machine,” van de Rijzen added.

Continued Collaboration

The Chocolate Factory continues to use Visual First to solve other design challenges. Most notably, developing a casting mold prototype to test product acceptance. The casting mold is currently made from plastic via traditional methods, which is both time consuming and expensive.

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3D printed replacement machinery parts manufactured in under a week using FDM, compared to over a month using traditional methods.

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