



Kärcher Shortens Design Cycles With Multi-Material 3D Printing

Kärcher is a name familiar to many households and gardeners, and its distinctive yellow and black logo is synonymous with cleaning systems around the world. Since 1950, when Alfred Kärcher invented the first high pressure cleaner in Europe, the family business headquartered in Winnenden, Germany, has expanded beyond its German roots and today boasts offices in almost 70 countries. The company has a vast product portfolio that includes high-pressure cleaners, vacuum and steam cleaners, vacuum sweepers and scrubber driers.¹

According to Kärcher, innovation is the most important factor to ensure company growth. In 2017, approximately 90% of all products in the Kärcher portfolio were five years old or less. With this level of optimization and innovation comes a need for fast, efficient and tailored processes, from the design stage to product shipment. Kärcher's secret to keeping up with ever-increasing production demands, while constantly driving innovation across its products, is attributable in no small measure to its use of 3D printing technology.

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Achim Sanzenbacher

Manager of Prototyping at Kärcher



PolyJet Technology Speeds Up Prototype Production

A veteran when it comes to 3D printing, Kärcher has been working with the technology for 20 years and has brought 3D printing in-house to optimize its production workflow. Using both Stratasys [FDM®](#) and [PolyJet™](#) technologies, Kärcher has understood the power of 3D printing in accelerating a product's time-to-market. Alphacam, one of the largest Stratasys resellers, based in Schorndorf, Germany, has accompanied Kärcher since the installation of its first FDM machine over 20 years ago.

Kärcher's recent product development is a prime example of optimizing a design to offer customers the best possible product. The EASY!FORCE trigger gun is the heart of the latest Kärcher high-pressure cleaner and operates with a unique technology. Its patented

design incorporates several different materials with varying rigidity and complex geometries. This combination makes realistic prototyping difficult using typical manufacturing methods.

"Traditionally we would use milling or order individual standard parts to assemble prototypes for products," explains Achim Sanzenbacher, Manager of Prototyping at Kärcher. "This not only took a long time, it also constrained our ability to create a true-to-life prototype with the look and feel of the final product. Stratasys PolyJet 3D printing with its rubber-like [Agilus™ material](#) and colorful, smooth [Vero™ material](#) has enabled us to create prototypes that mimic the final part in no time at all, speeding up our prototype development for the EASY!FORCE trigger gun significantly, compared to traditional methods."



Kärcher's EASY!FORCE trigger gun's patented design incorporates several different materials with varying rigidity and complex geometries, making realistic prototyping difficult with traditional manufacturing methods.

Realistic Prototypes That Mimic the Final Product

The PolyJet-based [Stratasys J Series](#), the world's only full color, multi-material 3D printers, enable over 500,000 colors and textures, and up to six material combinations in one print – ideal for ensuring high accuracy of parts with soft and hard materials needed for the EASY!FORCE trigger gun. With PolyJet technology, Kärcher is able to 3D print several different parts on one print tray. This allows the design team to test different variations of the same product in one go, which makes assessment of the best design more efficient and speeds creation of the final prototype.

“Creating a 3D printed prototype that allows us to replicate the different soft and hard materials in one print shortens our design cycles, as we can make a faster and better assessment that the prototype is fit-for-purpose and ensures our design meets the necessary functionality requirements much earlier,” says Florian Friedl, Specialist, Kärcher. “Our products are operated all day in commercial environments, so an accurate design is key to ensuring product functionality and durability when used in harsh environments for sustained periods.”

“Our longstanding experience with Stratasys technology enables us to understand when and

where 3D printing can improve our operations, shorten design cycles and support our employees in finding the best possible solutions for our customers,” Sanzenbacher comments. “We look forward to further exploring new applications with this technology that can help us further improve our go-to-market times and increase efficiencies.”



PolyJet 3D printing technology lets Kärcher create prototypes that mimic the final part, speeding prototype development for the EASY!FORCE trigger gun.

¹ The product portfolio also includes gantry car washes, drinking water and waste water treatment systems, water dispensers, a telematics-based fleet management system as well as pumps and watering systems for home and garden.

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