SAF™ Technology Expands Frontiers for Fast Prototyping and Parts Production

Known for its quality parts, 3D Composites provides a range of additive manufacturing (AM) services from its facility of 3D industrial printers and machine shop located in Arlington, Washington. Since its founding in 2013, the ISO-certified company has been primarily serving the aerospace sector with FDM® technology — manufacturing jigs, fixtures, tooling and production parts.

Currently, 3D Composites is expanding into new markets with the recent introduction of SAF™ technology into its fleet of Stratasys® printers.

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> **Co-owner of 3D Composites**

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Case Study

Seeking an alternative AM process

3D Composites was ready to branch out from its FDM base in serving the aerospace industry which requires strict adherence to compliance standards. “We have been 3D printing since the beginning, but through the years had taken on other methods like CNC machining and vacuum thermoforming to supplement jobs that couldn’t be covered by 3D printing alone,” said Kim Gustafson, co-owner of 3D Composites.

Technology advancements in 3D printing in recent years prompted 3D Composites to scale back from traditional manufacturing methods and put its focus back into 3D printing. Specifically, the company sought to produce parts with a customized design at a faster rate with less cost per part than injection molding, vacuum thermoforming or other AM procedures.

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The SAF next-level solution

The company saw opportunity in introducing SAF technology to complement its service line of AM processes. By 2023, the H350™ 3D printer was fully operational at 3D Composites, offering a competitive alternative to FDM or traditional manufacturing processes on production runs typically around 250 to 1,000 parts. “The H350 combines the newest 3D printing techniques with our trusted history of Stratasys products,” Gustafson said.

Regarding the material, 3D Composites was already familiar with PA12 for its rigidity, feature resolution and strength in its experience using it with some of its FDM and tooling jobs. “The showstopper was we already had a lot of data from our customer base on PA12. The amazing accuracy of the PA12 material is a confidence builder in taking on a new material process,” Gustafson said.

The consistency and accuracy of SAF technology and PA12 is a natural fit for quality assurance. “Being able to rely on the conformance of each individual part, build after build, with high volumes, is a real determining factor in including the new printing process in our quality management procedures,” Gustafson said.

Gustafson is quick to draw comparison to other AM processes, highlighting SAF’s ability to manufacture at much higher volumes. “With SAF, you can print 1,000 parts without a lot of hands-on labor or support removal,” Gustafson said. “The quality is phenomenal with less post-production work like filling, sanding, priming and painting. With SAF, all I do is change the color of the dye and it looks so much better. So from an aesthetic standpoint, it’s just hands-down better.”

A common software platform also reduced the learning curve during start-up. 3D Composites was already familiar with the Stratasys GrabCAD® Print Pro™ software platform it uses for FDM that reduces printing preparation time and scrap to save resources. Gustafson said: “GrabCAD Print Pro is just amazing for its efficiency and nesting capabilities.”

Responsive customer care made the decision to take on SAF easy. Stratasys technicians provided on-site assistance during the critical start-up phase while production ramped up with the H350 printer. “As a Stratasys user for over 10 years, I’ve been really happy with customer support. Other manufacturers want to sell you a machine and have you teach them how to fix it and what to do next,” Gustafson said.

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Realizing the savings and growth

In its short time in using the H350 printer with SAF technology, the consistency and accuracy of SAF technology and PA12 has already made a difference in quality while broadening the range of applications for 3D Composites' customers.

The savings in production time and cost, including labor, are obvious when 3D Composites can turn out prototypes and part iterations at a faster rate than other AM processes. SAF is proven to reduce lead times from weeks to days, over other AM processes like injection molding. The need to create an entirely new tool is eliminated when complex geometries and part variations are required. Post-production support for tooling maintenance and storage is also bypassed.

Here are a couple of customer examples:

- For an automotive customer, 3D Composites proposed bypassing injection molding and using SAF technology on short production runs of about 200 parts for each of two designs. By foregoing tooling, the customer's costs were reduced dramatically — about 50% per part.
- For another customer in transportation, instead of tooling with thermoforming as used in the past to create thousands of parts, the design was updated for production with SAF. As a result, the need for tooling was eliminated and the customer reduced their overall costs by four-fold.

With a lower cost per part, and more parts per build compared to other AM methods, 3D Composites only sees growth ahead. "The H350 presents new opportunities for us to be competitive. We can manufacture production parts at a much higher volume than before. That will really help us in broadening our clientele into other industries like marine and sports manufacturing," Gustafson concluded.

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