The company's 300-square-meter workshop features the latest equipment for part design, production, finishing and assembly.

Due Pi Greco Optimizes Product Development and Opens Up New Production Applications with FDM Technology

Case Study

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Mr. Diego Pagnan

Founder and Owner, Due Pi Greco

Founded in 2010 in Treviso, Italy, Due Pi Greco is a product development service provider specializing in the design, engineering, prototyping and manufacture of functional parts and components. The company serves a wide range of sectors, including industrial applications, healthcare and medical applications, household appliances, sports and racing.

Over the years, Due Pi Greco has established itself as a highly reputable solution provider for its customers' product development needs. It uses a wide array of technologies and software to turn ideas into sought-after products. The company's 300-square-meter workshop features the latest equipment, enabling the team to provide a full-service offering from industrial design to product prototyping and manufacturing.

While all these technologies play a key role, 3D printing is used across the company's entire design and development process. Due Pi Greco's journey with additive manufacturing started with several Stratasys FDM® 3D printers deployed at its production site. While they were used mainly for prototyping, it did not take long to appreciate the production potential of FDM additive manufacturing.

"When we started our business, we predominantly operated as a 3D printing service provider for prototyping requirements," explained Diego Pagnan, Founder and Owner at Due Pi Greco. "However, using our Stratasys 3D printers throughout all our development work enabled us to better understand the significant potential of additive manufacturing for production. This experience has changed our entire mindset and approach to our design and manufacturing workflow, with additive manufacturing now playing a key role throughout our product development process."

3D printed airbox on the University of Padua student race car. It was produced using FDM Nylon 12CF on the Stratasys Fortus 3D printer.

Part of the new 3D prototype steam generator produced using ULTEM™ 1010 resin.

Expanding Production With Carbon Fiber Additive Manufacturing

At its production site, Due Pi Greco has a dedicated 200 square meter additive manufacturing area featuring four FDM 3D printers, which strengthen the company's prototyping capabilities and enable the team to undertake series production jobs unachievable with traditional methods.

Most recently, the company was faced with the challenge of meeting a specific customer's need for functional production parts made from materials possessing superior structural performance and reliability. To meet the need, the management team invested in production-grade additive manufacturing. Having tested a number of technologies, the company approached Stratasys' local partner, Energy Group, to purchase a Fortus 3D printer. Key to the decision was FDM® Nylon 12CF – an advanced composite material comprising 35 percent chopped carbon fiber. Not only did the material properties meet the customer's high part-performance demands, it also allowed Due Pi Greco to expand its production capability and take on more jobs.

"Fortus 3D printers have always been reliable workhorses for us, but we decided to invest in the Carbon Fiber Edition, as we found it the best alternative to CNC machining expensive metal parts," said Pagnan. "The added capabilities have made an immediate impact on our production process. Using FDM Nylon 12 carbon fiber, we're able to 3D print parts that perform similar to those produced using CNC processes. This not only saves us significant time and cost compared to conventional production methods, but the quality of the parts has made a huge impression on our customers too and subsequently opened up new business opportunities for us."

These benefits were exemplified in a collaborative project with Università degli Studi di Padova (University of Padua), to design and produce an engine airbox for a single-seat Formula SAE race car. The company overcame the lengthy lead times and high costs of conventional carbon fiber production by 3D printing the entire airbox in FDM Nylon 12CF, achieving significant cost and time savings. The speed that the team could 3D print

the part was crucial in enabling them to iterate the design for optimal performance. This was also evident in another project for a leading Italian cycling brand in which the team used the Fortus 3D printer to optimize the design and production of a high-end bicycle seat. According to Pagnan, the customer reported that the result exceeded expectations in terms of surface finish and durability.

"The greatest challenge for today's design and manufacturing specialists is to deliver high-quality, top-performing solutions within strict deadlines and restricted budget. Both of these use cases are prime examples of how Stratasys FDM additive manufacturing has enabled us to tackle this challenge head on. Furthermore, the actual end results are also outstanding – in particular, the surface finish – which is exactly the type of added value our customers are looking for," he added.

Leveraging Stratasys FDM Materials to Open Up Entirely New Applications

The management team at Due Pi Greco sees Stratasys FDM materials as the main driver for expanding its use of additive manufacturing. The company has already started to leverage the distinct high-performance attributes of FDM Nylon 12CF, ULTEM™ resin, ST-130 soluble material and ASA, to create new production applications within different industries that enable additive manufacturing to replace traditional methods.

"Stratasys has a diverse range of high-performance materials that have allowed us to develop some innovative applications for our customers," explained Pagnan. "For example, we recently helped Zoppas Industries HET, a global supplier of heating systems for domestic and industrial use, develop a 3D prototype of a new steam generator – ISTMO – which required materials suitable to resist high-temperatures, as well as contact with steam. This was made possible with ULTEM™ 1010 resin, as it's the only polymer that can perform at high temperatures up to 216 °C."

"Likewise, we recently designed and produced prototypes for two rear wheel mudguards for a leading global producer of agricultural machinery. Leveraging the ASA material's durability and high UV light resistance, we were able to replace traditional ABS and save cost. Without the advanced properties of these materials, we simply wouldn't be able to exploit the great efficiencies of additive manufacturing for these types of demanding production applications," he concluded.

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