



A forming collaboration

Eastman and Helian Polymers team up to bring a new dimension to 3D printing.



Eastman **Amphora**™
3D polymer



A revolution begins

In 2011, plastics engineer Ruud Rouleaux and three fellow engineers began testing and developing additives and colorants for bioplastics and quickly saw the potential in developing appropriate polymers for the emerging 3D market. "It became obvious that 3D printing was largely a hardware-oriented platform and that there were very interesting opportunities for material development," Ruud says. "It was very exciting to see how compounds could now be used in a completely new application."

The development of a formulation of polylactic acid (PLA) that demonstrated reliable mechanical properties and printability led to the birth of Helian Polymers, headquartered in Venlo, The Netherlands, and the launch of colorFabb 3D printing filaments.

Expanding a market

Within a month, Helian sold out the capacity of their colorFabb production line—testimony to the rapidly growing 3D market. It also did not take Ruud and company long to realize that 3D printing had much greater potential and the market needed alternative materials to meet different needs.

"We very quickly realized we needed a range of special polyesters," he says. "We needed something that would demonstrate the tailored viscosity to work in 3D printers yet exhibit the toughness necessary to create functional industrial parts." According to Ruud, PLA's mechanical properties were insufficient; acrylonitrile butadiene styrene (ABS) released a bad smell and exhibited a tendency to warp; and polycarbonate (PC) was not free of bisphenol A (BPA) and was a difficult material for filament production. There were also new demands from the market about product compliance—particularly around offgassing in open nozzle systems.

Seeking an alternative to PLA and ABS, the company reached out to Eastman through its website. After a few meetings, the two companies formed a joint development agreement to test and develop specific materials for desktop 3D printing.

"Helian had a very intriguing set of needs," says Alex Dudal, Eastman market development representative. "In addition to a material that demonstrated dimensional stability, they also sought to fill a market niche to create filaments in a range of bright colors."

Eastman and Helian began testing materials and formulations, leveraging their combined expertise in high-performance polymers and 3D printing filaments to find a low-odor solution that still demonstrated the dimensional stability the industry demanded. The goal was to find or develop a polymer that was tough enough for high-resolution builds and industrial parts without generating an unpleasant styrene-like odor.





"Extrusion-based desktop printing hadn't found a solution for functional parts," says Alex. "Our collaboration with Helian is taking the market beyond mere prototyping. With Amphora, parts can be printed with the dimensional stability and functionality suitable for professional, educational, and personal use."

"The number of advancements we've been able to make in a relatively short amount of time is a testimony to the potential of our relationship with Eastman," says Ruud. "We were very glad to be working with Eastman on this project. The partnership has proven to be efficient and successful. Both parties showed great commitment in bringing this material technology to the 3D printing market in the shortest time possible. It's been very impressive!"

Low odor. High value.

The year-long collaboration resulted in the launch of colorFabb XT-Copolyester made with Eastman Amphora™ 3D polymer during the 3D Printshow in London.

Uniquely suited for the 3D market, Amphora was selected for its wide range of qualities that lead to improved printed parts, such as ideal melt strength, toughness, and layer adhesion. Specifically, the benefits for the 3D printing market include:

- ▣ Low odor and low emissions during printing at recommended temperatures
- ▣ Superior toughness required for truly functional parts
- ▣ Dimensional stability for strong, detailed items
- ▣ A high melt temperature, printable at 240° to 260°C, for smooth flow through the nozzle
- ▣ Effective compatibility with colorants and additives
- ▣ Attractive gloss for lustrous creations



To purchase colorFabb XT filament
made with Eastman Amphora™ 3D polymer,
visit www.colorfabb.com/xt-copolyester.



For more information, contact your
Eastman representative or visit us at
www.Eastman.com/3D.

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