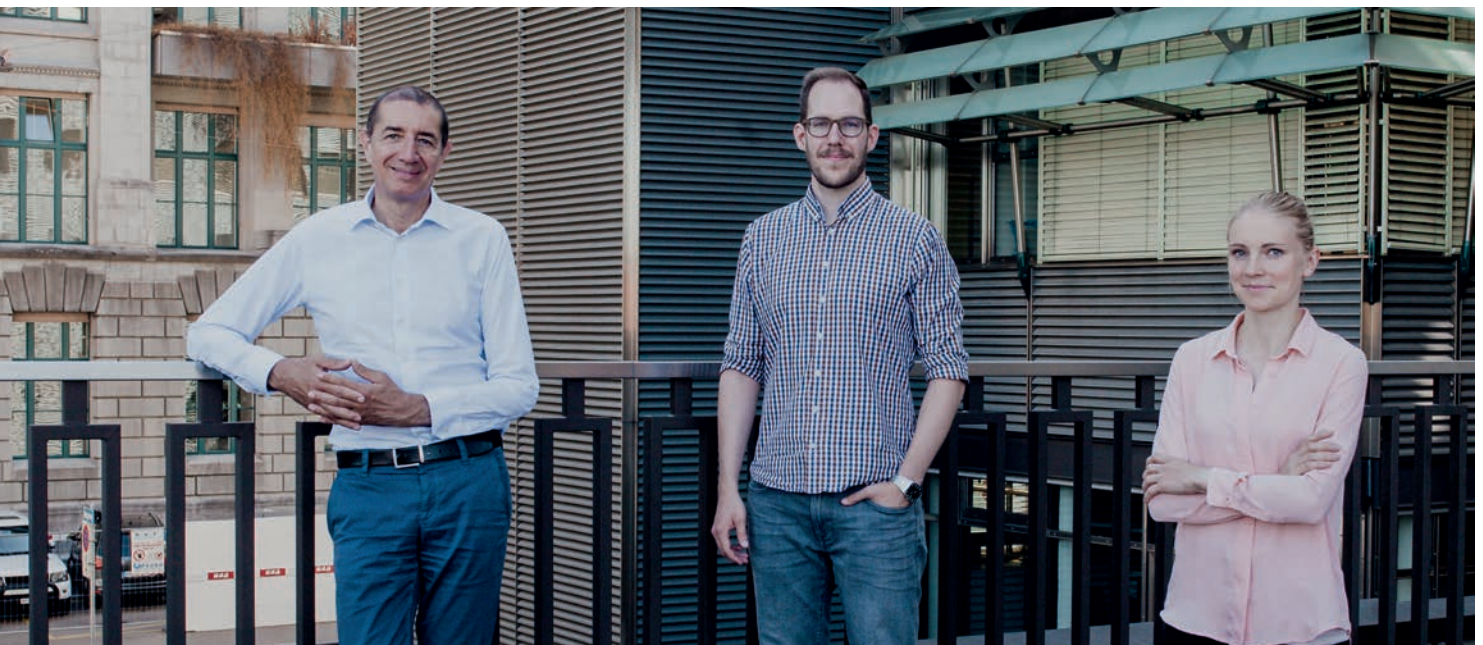




New Plastic Heroes: Antefil

Lightweight Material of the Future

Efficient and sustainable – Antefil shows that this is possible with composite materials on a large scale. The start-up produces thermoplastic polymer-coated glass fibers for lightweight structures. The innovative approach reduces cycle times from hours to seconds, while the hybrid fibers produced are made from 100 % recycled material.



The people behind Antefil: Prof. Dr. Paolo Ermanni, Technology lead; Dr. Christoph Schneeberger, Executive lead, and Dr. Nicole Aegerter, Operational lead (f.i.t.r.). © Lea Ladner

The hybrid fibers from Swiss start-up Antefil are thinner than a human hair. They are intended to serve as a sustainable and cost-efficient alternative to composite materials currently available on the market, particularly in the mobility and transportation sector. In this interview, Dr. Christoph Schneeberger,

Executive Lead & Co-Founder, explains the path from the idea to the finished product – and how circular economy and efficiency have never been out of focus.

Plastics Insights: *What is your elevator pitch?*

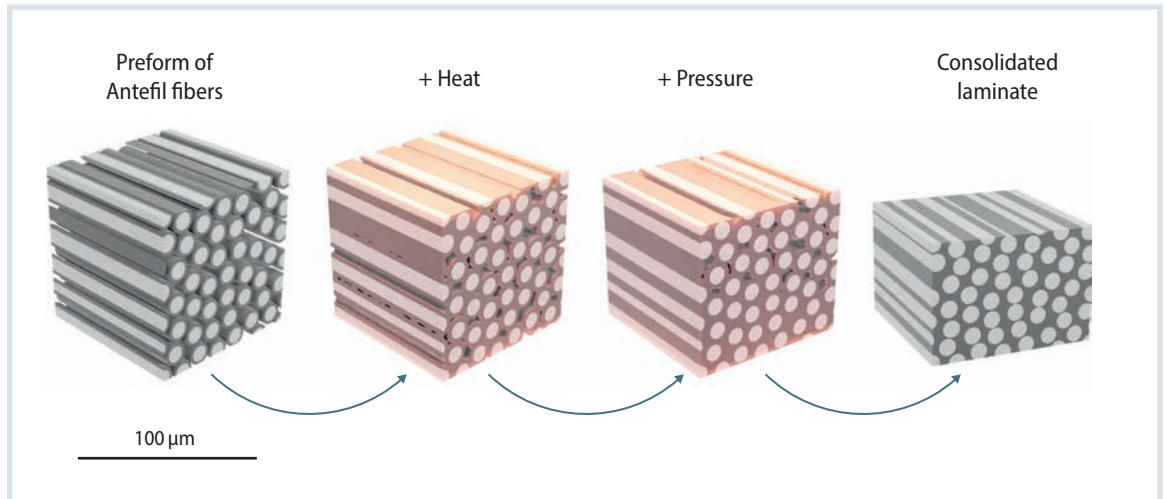
Christoph Schneeberger: We offer an efficient and clean way to produce lightweight components. Our patented technology allows the production of glass fibers that are individually coated with a recyclable thermoplastic. With these fibers, lightweight structures can be manufactured using pressure and heat. The technology stands for an efficient, circular production of composites – even at a large scale. Economic advantages include reducing cycle times from hours to seconds while increasing material performance by 20 % or more compared to state-of-the-art production methods, all while offering fibers made from 100 % recyclates. »

Info

Facts on the Start-up

- Name: Antefil Composite Tech AG
- Foundation: 2022 in Zurich, Switzerland
- Number of employees: 9
- Number of customers: 9 pilot customers
- Homepage: www.antefil.com

Illustration of how preforms made from hybrid fibers consolidate on a microscopic level. © Antefil



Plastics Insights: *What product do you offer?*

Schneeberger: We produce continuous fibers from recycled glass, thinner than human hair and individually clad in a precise amount of thermoplastic polymer. This sheath is applied right during glass fiber production, in-line with the spinning process. Heat and minimal pressure turn textiles made from these microengineered hybrid fibers into high quality structures, but for a fraction of the time compared to resin infusion. Our proprietary value chain can cut cycle time from hours to seconds by avoiding infusion and cure entirely. It offers high-performance and quality through a guaranteed uniform fiber distribution and high glass content; and provides weldable and recyclable materials, that support a circular economy for sustainable lightweighting.

Plastics Insights: *What problems are you solving?*

Schneeberger: Our hybrid fibers are the answer to several key challenges in the continuous fiber composites industry: Unlike conventional processes, we significantly reduce production costs by enabling more efficient low-pressure processes. While existing processes take anywhere from ten minutes to a full day to complete a single production cycle, our solution reduces production times to just a few seconds. And when it comes to sustainability, we only use recyclable materials and offer fibers made from 100% recyclates, supporting a circular economy and lowering the environmental impact of our industry. As a result, our cost-effective, high-performance and sustainable products make continuous fiber composites more accessible for broader adoption, especially in high-volume markets.

Plastics Insights: *Where is your product used?*

Schneeberger: We are primarily targeting applications in the mobility and transport sector. While these markets have driven innovation in the composites field for decades, the high cost pressure still limits the adoption of continuous fiber-reinforced polymers over heavy steels and other metals. This creates an opportunity for solutions like ours which simplifies the supply chain and reduces production costs on all fronts. Examples include automotive and truck structures or aircraft interior components.

At the same time, we are leveraging the circularity of our materials for applications in consumer products, especially in

sports equipment. This market is much more focused on sustainability as a major value proposition and we strongly believe in supporting this trend.

Plastics Insights: *What sparked the idea?*

Schneeberger: The idea for Antefil's hybrid fiber technology emerged from our founding team's research at ETH Zurich, where we focused on advancing thermoplastic composites in terms of laminate quality and processing efficiency. We quickly realized that the industry had been stuck in developing incremental improvements to try and make impregnation processes faster and more robust. After taking a more holistic view of the entire supply chain, we found that impregnation itself presents a bottleneck for almost the entire industry, meaning there was a need for a more disruptive approach. Our technology lead, Paolo Ermanni, came up with the idea to produce intermediate materials based on individually coated fibers after struggling with the quality of laminates derived from commingled yarns. These materials consist of reinforced fibers mixed with thermoplastic fibers in the same yarn and the quality of this mingling has a huge effect on how fast and to which quality such yarns can be processed. If you will, our hybrid fibers are the ultimate solution to this: every fiber is fully wetted and carries exactly as much polymer as is needed in the final product.

Plastics Insights: *How did Antefil come about from this idea?*

Schneeberger: Nicole Aegerter and myself became part of the team to develop ways to produce and test the fibers invented by Paolo Ermanni. We were quickly successful, which ultimately resulted in the filing of a patent and the founding of our ETH Spin-off Antefil.

Plastics Insights: *What motivates you?*

Schneeberger: Our motivation stems from a commitment to transform the industry by providing cost-effective, high-performance, and sustainable alternatives to what is on the market today. We are convinced that thermoplastic composites are the lightweight material of the future and want to support global efforts to adopt this energy-efficient solution on a broader scale by lowering cost barriers and promoting circularity.

Plastics Insights: *What challenges do you face?*

Schneeberger: The biggest challenge for Antefil by far is the scale-up of production operations. While our technology is highly scalable and can be adapted to any glass spinning factory in the world, the volumes we are aiming for are a big jump for us, especially regarding the mobility and transport sector. It is for this reason that we are scaling beyond the laboratory and sample production level by working with partner factories. The rationale is simple: the unit economics of our fibers are dominated by direct material costs and the production costs associated with the glass spinning – our coating modules are much cheaper in comparison, require less energy to be run, and can be operated by the people working on the spinning lines. Through such partnerships, established fiber producers get access to new technology, allowing them to grow their foothold or even enter new markets and applications, while Antefil ensures the capacity needed to grow its business in the medium and long term. This means that despite Antefil being based in Zurich, it really is an international undertaking since its inception. This comes with its own challenges, but is very exciting and fulfilling to drive forward!

Plastics Insights: *What milestones have you reached so far?*

Schneeberger: Antefil is still a young company and we are just starting to develop its business. Nevertheless, we have already published a first demonstrator in collaboration with Bionic Composite Technologies (Biontec) and IWK Institute for Materials Technology and Plastics Processing, which received great feedback at the last two JEC World trade shows. Behind the scenes, we are primarily conducting pilot projects with a diverse set of composites manufacturers, ranging from automotive and aerospace suppliers to producers of composite feedstock and more niche applications of lightweight structures for various industries and consumer goods. At the same time, we are hard at work to scale our production capacity, having run successful tests at a partner factory in late 2023. Our efforts so far have been bolstered by securing a total of just over CHF 3 million in funding, including just shy of half a million in non-dilutive grants and awards. It has been exciting to see our team grow to nine employees and to continually experi-

ence how well our products and processing solutions are received by the composites and plastics community!

Plastics Insights: *Finally, what are your next steps?*

Schneeberger: We scheduled the market launch of our first product range for Q2 2025, with a targeted capacity of 1–2 tons per month. Additionally, we are negotiating multiple large-scale demonstration projects and production tests for 2025 and 2026, and have a pipeline of over 40 new customer leads. Our recent achievements together with the planned milestones have positioned us well for our upcoming seed round, which aims to support our market introduction and accelerate the scale-up of our operations. ■

Interview: Antonia Perzl