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Press review Pollen AM

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How Does Pollen AM technology Foster Innovation at Decathlon?

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The French group Decathlon is constantly looking for innovations in the field of sports and leisure: who out there has not heard of the 2 second tent, diving masks or its windsurfing kit? The company has surrounded itself with a solid team of engineers and designers, with more than 65 patents filed in 2019. Added to this is the "AddLab," its laboratory dedicated to additive manufacturing, which allows both prototypes and finished parts to be imagined more quickly thanks to a complete machine park, with solutions ranging from FDM to Multi Jet Fusion. Among Decathlon's 3D printers is Pollen AM's technology, in which the group has invested since the opening of the AddLab more than six years ago. Today, it has two PAM Series P machines that allow it to produce "right material" prototypes, i.e. functional prototypes close to the real material of the final product that will allow the users to validate its characteristics and functionalities. Decathlon's designers and engineers rely on Pollen AM's technology and the range of materials offered to quickly validate innovations, no matter their complexity.

Historically, additive manufacturing has always been used for rapid prototyping: with a 3D printer, a company can quickly get a first visualization of its product and make the necessary iterations. While the technology allows for this preview, it does not necessarily offer material characterization: how to test the mechanical characteristics of a future part? Its chemical properties? And how can users be sure that the results obtained on a 3D printed prototype will

be the same as on a cast part? This is where pellet 3D printing processes are interesting because the material undergoes fewer transformations than a filament, for example, and therefore has characteristics more similar to those of injection molding. This is one of the reasons why Decathlon chose Pollen AM technology: the goal was to print prototypes with the material used in large-scale production to obtain properties that were as close as possible to the final part.



A prototype 3D printed ski pole basket (photo credits: Decathlon)

Right Material Prototyping With Pollen AM technology

Jimmy Gantier is the Right Material Prototyping Manager of the AddLab at Decathlon. He is in charge of the prints made on the Pollen AM machines. He explained to us: "My job is to manage the material and the way of printing. In concrete terms, a designer or engineer comes to see me and provides me, beyond his 3D file, the material that will be used in large-scale productions. I will then characterize the material to print it on the Pollen. This allows me to design prototypes that will be used for use tests or in the laboratory to directly study the behavior of the part with the right material. For certain product categories, we will then be able to modify the product more quickly, without going through molding steps that are time-consuming, expensive and represent a certain energy cost." Today, PAM Series P machines 3D print a lot of prototypes using TPE, TPU or SEBS, especially for water sports such as diving masks or different types of soles. The quantity of prototypes designed varies according to their size, but one thing is certain: the rate is controlled.

Thomas is a product engineer at SUBEA, Decathlon's underwater sports brand. He explains the interest of using Pollen AM's technology for this application: "Today, one of the biggest difficulties in the design of a mask is to ensure the waterproofness of the product on the greatest number of different faces. We make a first 3D model, often inspired by existing face contacts, which we then

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have to test as best we can before opening the industrial mold (10 weeks / several tens of thousands of euros). In recent years, we used a prototype mold (8 weeks / nearly 10K euros) for the first iterations, which were long and costly, and then opened an industrial mold that we systematically reworked. Digital simulation has enabled us to greatly reduce the number of iterations on prototype molds, but not yet to do without them. Completing it with right material prototyping thanks to Pollen AM could allow us to go from the digital model to the industrial mold without intermediate mold. We could save up to 3 months and 20,000€, not to mention the CO2 impact of a mold made in Asia and dozens of parts sent by plane." For now, Decathlon has used this process for a first concept and was able to validate the prototype's waterproofness. The teams will validate the correlation between this printed model and a very close model injected on prototype mold.



Different diving mask prototypes have been 3D printed (photo credits: Decathlon)

One of the advantages of the Pollen AM 3D printers is the possibility to use a wide variety of elastomers with a very low Shore hardness and therefore a better flexibility. Decathlon is able to design prototypes with different Shore 00, SHORE A and/or SHORE D hardnesses and expand its range of soft materials to the maximum. The group has also carried out a lot of work on the hooking plates and printing supports of each of the elastomers used. Indeed, Jimmy has characterized all materials to associate them with the best possible soluble support. This allows both to imagine more and more complex designs but also to save time. The support dissolving in water, the post-processing does not require human labor and therefore no immobilization in human time.

Jimmy continues: *"Another important advantage of the Pollen AM machines is the multi-extrusion. We can print up to 4 materials which is extremely interesting. For example, for ski poles, I can design a very hard shell and a rim with a rather flexible elastomer and soluble supports. In just a few hours, I can create a prototype with multiple materials and very complex geometry."* The two Pollen AM machines

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are also used to produce some parts that will simulate overmolding. They are also used to replace materials.

At Decathlon, the teams are sensitive to the environmental impact of their product. Thanks to additive manufacturing, and more particularly to materials compatible with Pollen AM technology, because of the time and financial savings, they can easily imagine and test prototypes with a more virtuous material.



These prototypes have been tested (photo credits: Decathlon)

A Manufacturer Who Listens to Your Needs

If Decathlon is today able to make the most of Pollen AM's technology, it is also thanks to a collaboration that works. The French group produces regular reports and gives feedback on errors and possible interesting developments to the manufacturer, enabling it to adjust its machines and find solutions. Jimmy explains: *"Pollen AM offers me its innovations and I give them my problems and ideas. We put everything together to offer the best solution according to the type of material. The exchanges are constructive, there is a real relationship that has been created and which is now essential in my work. I can count on their customer service which is reactive – this is very important when you work non-stop with 3D printers, especially FDM. We are very satisfied with our 3D printers, in terms of maintenance, materials, speed. They can handle all elastomers and print multiple materials at once, which is a huge advantage when you're doing right material prototyping."*

The increased demand for Pollen AM's 3D printing technology is also reflected in the company's growth. In the past two years, its workforce has doubled, and it expects to hire another four

The Pollen AM team adds: *"Even if the FDM process is particularly democratized in the industry, many companies use closed systems that do not offer operators the possibility to increase their competence on the method aspect of the FDM process. For the past 10 years, we have been supplying open systems and it seems obvious to us that our support function is the pillar of our users' success, but also of our own. Our link with Decathlon, and our customers in general, allows us to stay close to their daily life in order to bring our method (system) expertise through specific training modules or to answer a need through a targeted development."*



Photo Credits: Decathlon

Decathlon's future projects

Jimmy confided to us that the future developments of the group around the Pollen AM technology concern mainly the materials. He will indeed start a work on 100% biodegradable and bio-designed materials; it is a question of testing granules based on vegetable waste. The objective is to understand if their behavior can be associated with a Decathlon product. If you want to know more about it, click [HERE](#).

Do you know Pollen AM's technology and its use for right material prototyping? Let us know in a comment below or on our [LinkedIn](#), [Facebook](#), and [Twitter](#) pages! Don't forget to sign up for our [free weekly Newsletter here](#), the latest 3D printing news straight to your inbox! You can also find all our videos on our [YouTube channel](#).