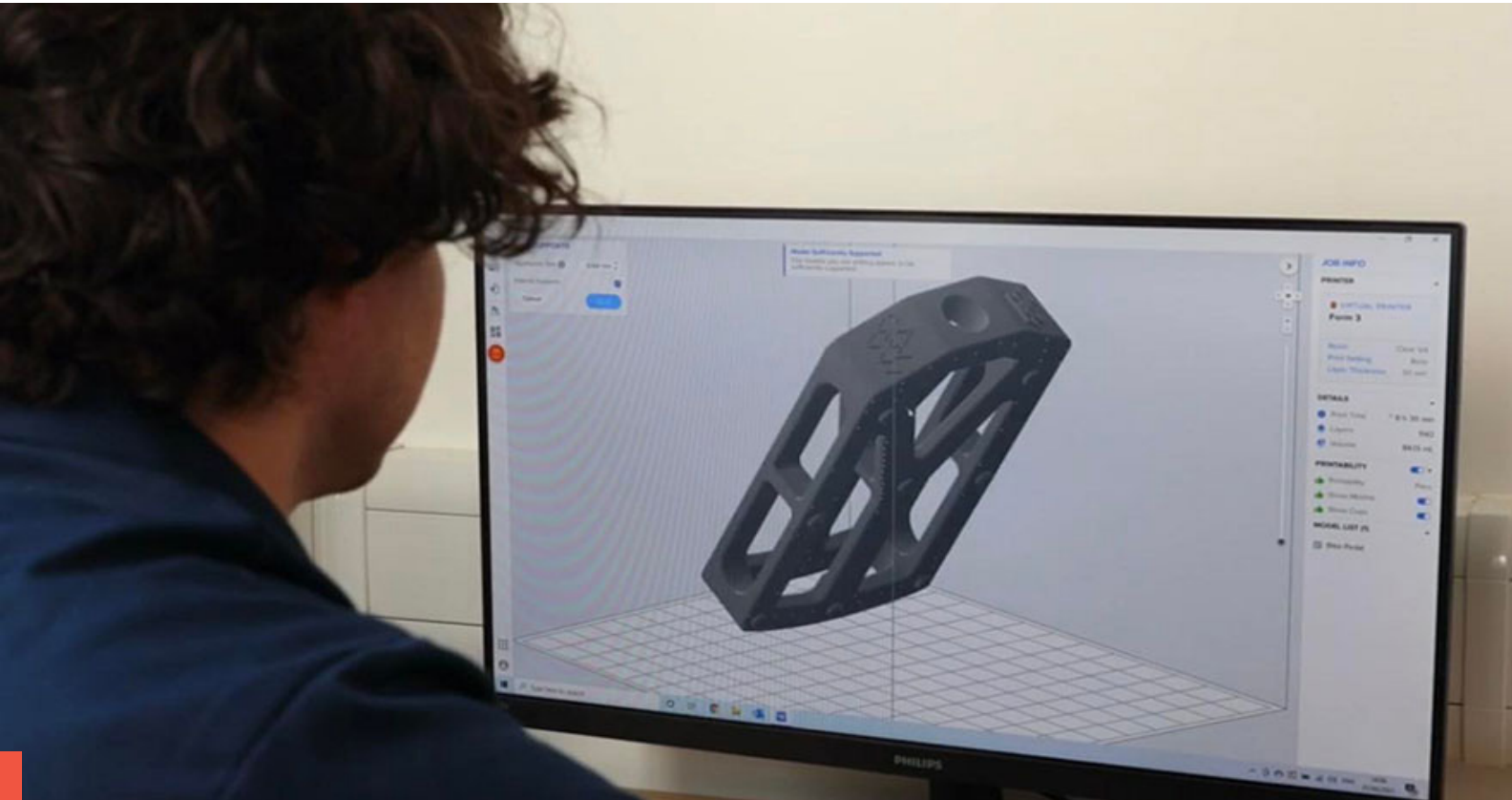


Achieving Zero ONYX[®] Waste



DRYWISE BOOSTS MARKFORGED ONYX PRO PERFORMANCE AND REDUCES FILAMENT WASTE - PRINTPOOL

Nestled beneath the 'dreaming spires' of Oxford, Printpool offers 3D printing services to a wide-range of businesses that have sprung up around the historic city. Many of these are spin-outs from Oxford University - the oldest university in the English-speaking world.

Printpool offer filament, resin, and powder 3D printing to their customers, who rely on them for

quick turnarounds, outstanding quality, and friendly support.

As an exclusively business-to-business smart manufacturing service, Printpool aim to take away the hassle of running 3D printers in-house, so that engineers and product designers can concentrate on creating innovative products, rather than tinkering with machines.

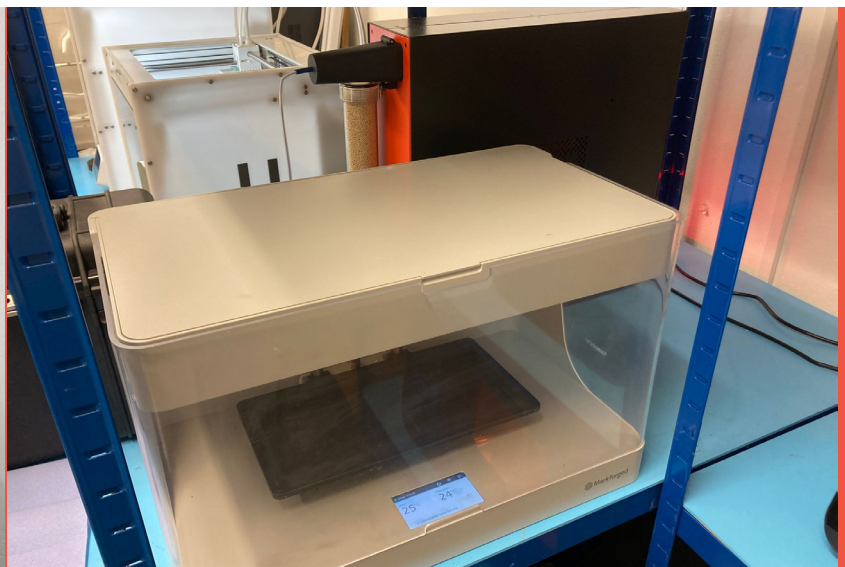
The Problem of Moisture Absorption

Printpool has offered parts made using Markforged's proprietary Continuous Fibre Reinforcement (CFR) technology since they launched in 2020. The backbone of all CFR prints is Onyx, a unique material made up of Nylon and chopped carbon fibre. This material is extremely sensitive to moisture however, which presented an ongoing problem.

Although Markforged supply dry boxes to store the material in while it is being printed, large prints often require the majority of the spool, and pausing the job half-way through can leave a visible artifact on the finished part - which was unacceptable for Printpool's stringent quality control. This meant that Printpool regularly had to start a new spool of filament before the previous one was finished. These half-used spools were then exposed to Oxford's humid atmosphere - rendering them unusable!

Drying filament once it has been exposed to that much moisture is no easy task. Printpool was storing filament that had been compromised in airtight cupboards, surrounded by packs of silica gel, in an effort to minimize the absorption - to little effect. Drying filament in an oven was an option, but this was only possible if there was enough pre-notice that it would be needed (as it is very time consuming) - which rarely happens in a busy bureau environment. Oven dried filament also had disappointing print quality and mechanical performance, compared to virgin material.

The end result of this hygroscopic material problem was that Printpool had 20-30 partially used spools building up every year. This amounted to £2000-£3500 of wastage every year, which meant there was a huge financial and environmental incentive to find a solution.

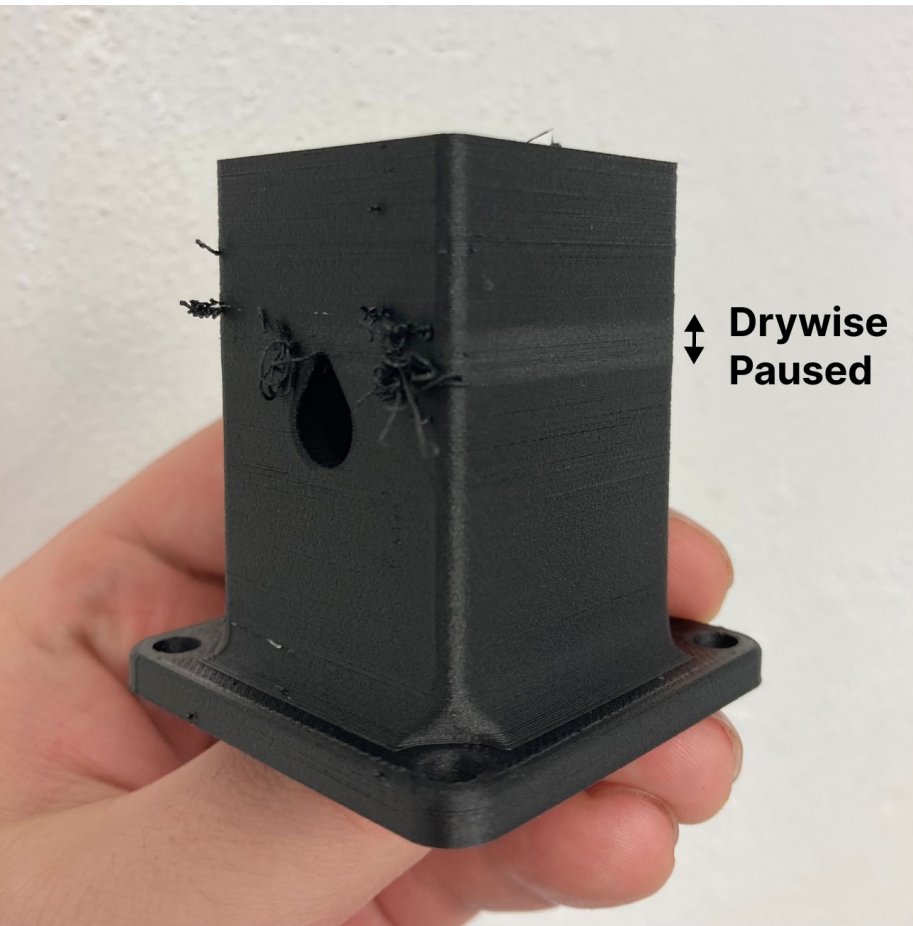


Ultimate Material Quality Control

All attempts to print using compromised material had been unsatisfactory, until Printpool tried Drywise.

“Right from the off, we were able to print with Onyx filament that had been exposed to the air for months, and we honestly thought would be unusable. It printed like it was fresh from the box, and to all intents and purposes was just like completely new filament” Gerard Shields, Managing Director, Printpool

As Printpool had saved the partial spools of filament in hope of a good filament drying solution, they were able to steadily work through the stacks of material that had been left exposed to the air. Even the oldest and most damp filament, that had been left out for 6 months or more, was fully printable when used with their Drywise inline filament dryer.



The dramatic difference in part quality can be seen easily on this part printed by Printpool. To demonstrate the difference that the Drywise machine made, they paused the filament dryer midway through an Onyx print. Defects began appearing immediately, and the entire color of the filament changed, leaving a paler, less consistent finish. When the Drywise was restarted, the problems disappeared.

The value Drywise brought

Printpool have been delighted with the difference that the Drywise has made to their production. Previous attempts to introduce other filament dryers into their workflow had been unsuccessful, but that changed with the introduction of Drywise. Printpool now uses the Drywise for all Onyx 3D printing, to ensure consistency and perfect results - with both brand new, and moisture-damaged Onyx filament.

As Drywise only dries the filament moments before it is extruded, Printpool don't need to worry about moisture being reabsorbed into the filament again before it is used. This makes planning print jobs easier, as there is no need to allow for length drying cycles in the oven before scheduling a print.

▶ **Zero material waste**

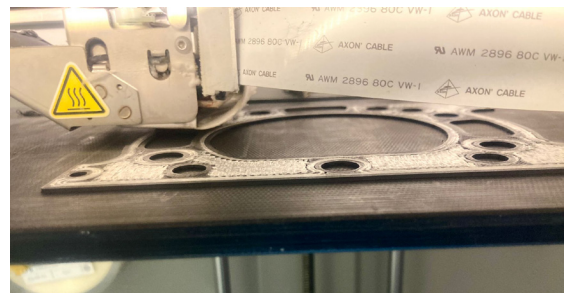
A big improvement in environmental performance, and savings of £2000-£3500 per year.

▶ **Saving Time**

Nearly instant set-up time allows to provide service with quick turnover.

▶ **Superior print quality**

Superior print quality with impeccable surface finish and uncompromised mechanical properties.



“We’ve been so impressed with what Drywise can do that we’ve started using the device for other 3D printers and filaments, such as the carbon fibre options available with the Bambu Labs range of machines. So far, the results have been excellent.”

Gerard Shields,
Managing Director, Printpool

A NEW PARADIGM

Printpool's journey with Drywise has been nothing short of transformative. By effectively tackling the persistent issue of moisture absorption in Onyx filament, Drywise has not only eliminated wastage but also unlocked unparalleled material performance.

Through rigorous testing and real-world application, Printpool has validated Drywise as the ultimate solution for maintaining the integrity of Onyx filament, even after prolonged exposure to moisture. The ability to recondition partially used spools of filament, has not only saved Printpool thousands of pounds in wastage, but has also significantly reduced their environmental footprint.

Moreover, the seamless integration of Drywise into Printpool's workflow has paved the way for broader adoption across various 3D printers and filament types. By extending its benefits beyond Onyx filament to include other carbon fiber filament brands and other materials, Printpool has solidified Drywise as an indispensable asset in their quest for superior quality and consistency.

Drywise has empowered Printpool to uphold their commitment to excellence, ensuring that every print produced reflects their dedication to quality and customer satisfaction. As they continue to push the boundaries of innovation and smart manufacturing, Drywise remains an invaluable ally, propelling them towards greater efficiency, sustainability, and success in the dynamic world of 3D printing.



Printpool is a specialized 3D printing service located in Oxford, UK, catering to the precise needs of small, technical teams throughout the country. With an extensive selection of FDM, SLA, and SLS materials and processes, we offer everything from flexible silicone-like parts to ultra-strong 3D printed composites. Our expertise is in rapid prototyping, design verification, and low-volume production, embracing the versatility of additive manufacturing for complex geometries and high-quality end products

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Thought3D, the creators of Magigoo and Drywise, is a pioneering company dedicated to addressing and resolving the challenges associated with the drying of hygroscopic materials in the FDM 3D printing. Drywise, our flagship product, is a groundbreaking in-line filament drying solution, meticulously engineered to deliver consistent, reliable, and on-demand filament drying. Specifically designed for industrial desktop 3D printer users, Drywise ensures optimal print quality by maintaining the ideal moisture levels in printing materials, thereby revolutionizing the 3D printing process.

www.drywise.co

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Drywise)