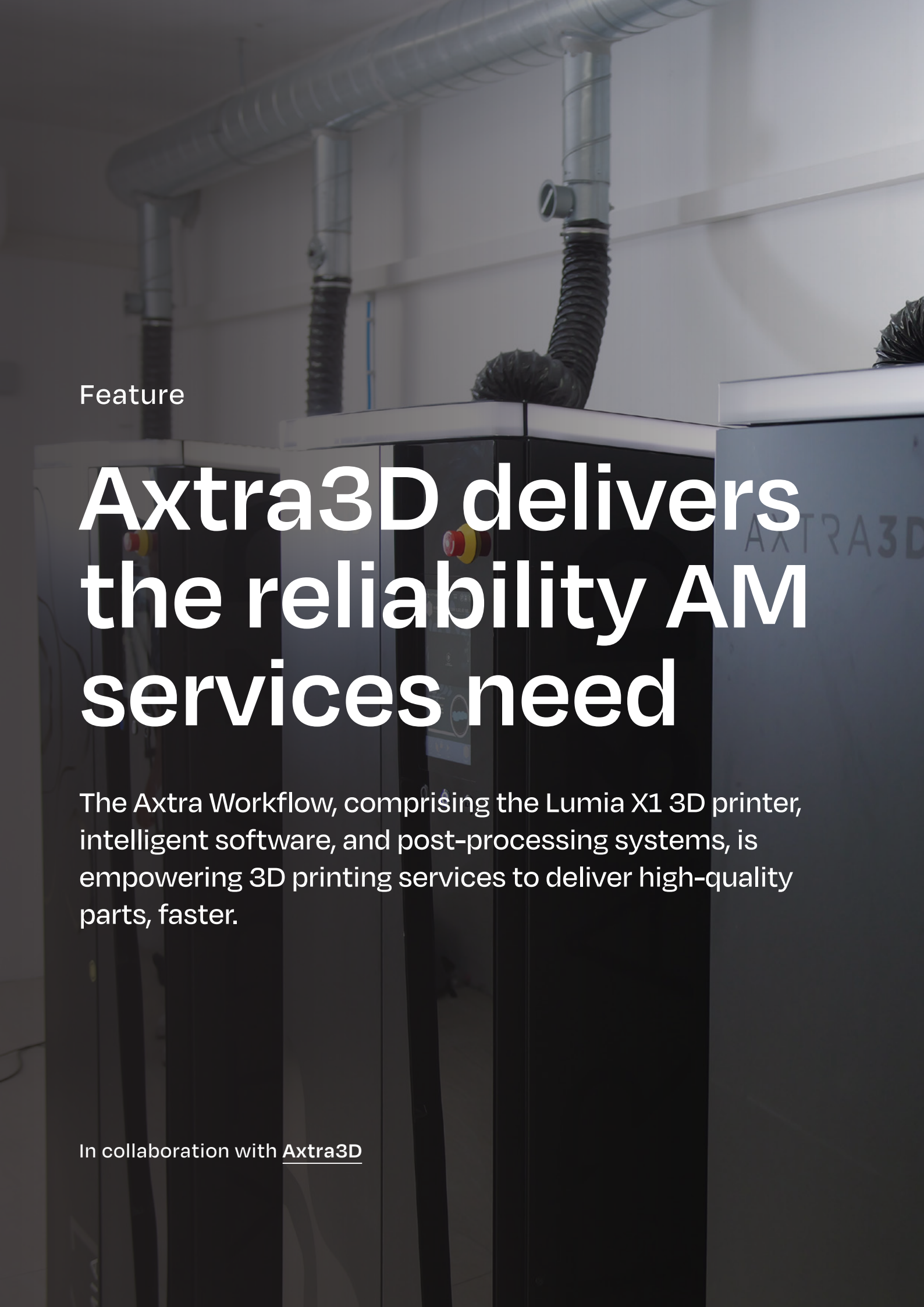




Feature

Axtra3D delivers the reliability AM services need

The Axtra Workflow, comprising the Lumia X1 3D printer, intelligent software, and post-processing systems, is empowering 3D printing services to deliver high-quality parts, faster.

In collaboration with [Axtra3D](#)



Protolabs, Met-L-Flo, Dinsmore, Laser Prototypes Europe, Prinoa, and Prototek. These 3D printing services all serve different regions and have different specialities. California-based Dinsmore, for instance, specializes in small high-precision components like artery stents, while Prinoa specializes in producing devices for the dental market like splints, crowns, and bridges. Despite these differences, all these services share one thing in common: they use Axtra3D's Hybrid PhotoSynthesis (HPS) technology.

Brought to market via the Lumia X1 platform, HPS technology has been a welcome addition to many services' AM fleets, enabling them to benefit from rapid *and* high-precision photopolymerization. Not only that, the end-to-end Axtra3D Workflow gives these expert users access to a full ecosystem of integrated hardware and software solutions that accommodate the high-throughput, high-mix nature of a service's output.

As we'll see, Axtra3D's end-to-end offering is playing a role in the advancement and scalability of polymer 3D printing services.

Meeting services' needs

Polymer AM services represent a valuable market segment worth in the range of \$3 billion and there is little question why it continues to grow. Services function as a vital bridge between additive manufacturing technologies and those who seek to benefit from AM but who are not prepared to or do not have the internal skills to adopt the hardware in house. AM services offer not only expertise, but capability and scalability

that many enterprises cannot handle independently. In some cases, services function as the on-ramp for those seeking to ultimately adopt AM solutions.

In order to best serve their customers, AM services rely on 3D printing solutions that are reliable, efficient, and flexible. Reliable in the sense that machines are consistent and do not require significant downtime; efficient in the sense that parts can be produced rapidly and economically; and flexible in terms of the types of materials that can be used to maximize output variety. Axtra3D's 3D printing ecosystem addresses all three of these points thanks to its combination of advanced hardware, materials, and software.

The Axtra Workflow

Without further ado, let's see what the Axtra Workflow has to offer. In short, the Axtra Workflow is a connected production ecosystem that covers each step in the production chain, from build preparation to final inspection. The Workflow comprises hardware and software and is complemented by Axtra3D's material ecosystem.

Hardware

On the hardware front, the company's Lumia X1 3D printer is at the core of its solution. This platform integrates three key technologies:

- Hybrid PhotoSynthesis, a photopolymerization process that combines dual light sources (DLP and laser) for achieving both rapid curing rates and high-accuracy details.

- TruLayer Separation, a sensor-embedded glass plate positioned below the printer's membrane that facilitates the rapid detachment of the print layer from the vat membrane resulting in faster print times.
- TruLayer Adaption, a system that ensures consistent resin layer thickness by dynamically adjusting the glass plate's flatness throughout the printing process, resulting in faster curing times and greater layer uniformity.

Other notable specifications for the Lumia X1 include a large build size of 249 x 140 x 495 mm and a relatively compact overall footprint

of 800 x 800 x 1800 mm. Overall, the system allows users to operate at over 70% capacity with 90% uptime rates for lights out production.

The Axtra Workflow also comprises two other hardware systems: the Axtra.Wash, an automated cleaning station that has different cleaning profiles based on material type and print profile; and Axtra.Cure, which offers both thermal and UV curing as well as automated parameter selection, eliminating process variation and user input. Of course, AM services can opt to use their existing post-processing solutions for HPS printed parts.

The Lumia X1 printer with the Axtra.Wash and Axtra.Cure units, the hardware behind the Axtra Workflow.

Image: Axtra3D





Software

Underpinning all these hardware systems is software. At the beginning of the Axtra Workflow is Volume, the company's proprietary build preparation software. This user-friendly program simplifies virtually all print preparation tasks including part orientation, support generation, material selection, slicing, build simulation, and time estimation. The program also includes various validated print profiles for different types of materials, which dictate print settings as well as post-process parameters. Presently, there are over 25 materials with validated print profiles. (It is worth mentioning that users can use third party build preparation software if that suits them.)

The Axtra Workflow is completed by Axtra. Insight, a data intelligence system for closed-loop process validation. This system, which includes over 155 on-board sensors, captures real-time workflow data from across the production chain and identifies potential issues. As Axtra3D says: "This creates a feedback

loop for troubleshooting, repeat orders, and process improvement." In other words, it's an incredibly valuable built-in capability for AM services.

Materials

Another important part of Axtra3D's production solution is its material ecosystem. Over 25 materials have already been qualified for use on the Lumia X1, including engineering resins from Henkel, Arkema, ForwardAM, and 3D Systems; dental resins from Keystone, Pro3dure and NextDent; casting resins; and various general use resins. The Lumia X1 also enables rapid material changes—within just 10 minutes—which is vital for services that produce different types of parts on a single machine.

For maximum flexibility, Axtra3D offers two options for users. With Axtra Solutions, customers receive a turnkey 3D printing system with the validated print profiles for the aforementioned materials; with Axtra OpenAccess, users have greater flexibility to work with unvalidated materials and develop their own materials and print parameters.

"Service bureaus operate in a highly competitive landscape, where differentiation often hinges on the ability to offer a wide variety of materials and experiment with new materials to cater to diverse client needs," Axtra3D commented. "AM equipment must also support quick material changeovers and high print throughput to meet tight deadlines without sacrificing quality."

Overall, the Axtra Workflow's combination of cutting-edge hardware, software, and flexible materials meets the repeatability

"Service bureaus operate in a highly competitive landscape, where differentiation often hinges on the ability to offer a wide variety of materials and experiment with new materials to cater to diverse client needs."

requirements of even the most demanding 3D printing service bureaus. "By connecting build preparation, printing, washing, curing, and analysis, Aextra Workflow turns individual production steps into a controlled and traceable manufacturing process," the company says.

Aextra3D's service partners

Presently, Aextra3D's solutions are in use at a number of service bureaus across the globe, empowering them to meet the diverse needs of their clients in an efficient, economical way.

Protolabs

At Minnesota-based Protolabs, Aextra3D's Lumia X1 3D printer has been integrated into its production fleet in large part thanks to its printing rates and material versatility. The company uses the 3D printing solution in combination with various materials, such as Ultracur 3D RG 3280, to produce injection mold inserts, electrical connectors, and other functional parts.

"The addition of the Lumia X1 allows us to offer greater speed in SLA technology while providing access to more functional

materials, in addition to the part quality our customers expect,” said Kenny Capps, Protolabs’ 3D Printing Director of Manufacturing Operations, when the service acquired its first Lumia X1 in 2024. Since then, Protolabs has acquired two more systems and even qualified a new material, Medical White (MED-WHT 10), for use on the platform.

Met-L-Flo

Illinois-based 3D printing service Met-L-Flo has been using Axtra3D’s technology in recent years for the production of insert molds. As of 2024, the company was injection molding over 500 parts per 3D printed mold set for low-volume production applications.

“While using printed tooling solutions in injection molding isn’t entirely new, the ability to rapidly produce components significantly reduces the risk of failure,” said Carl Dekker, President of Met-L-Flo. “If a tool needs replacing, it has to be done quickly—otherwise, the machine, setup, operators and support personnel are all left in limbo. When working on material and time-sensitive projects, waiting days to get back up and running simply isn’t an option.”

Dinsmore

At California-based service provider Dinsmore, the Lumia X1 has been a key part of its production fleet. Part of the ADDMAN Group, Dinsmore specializes in micro-printing and has put Axtra3D’s solution to work for the production of high-precision components, including an artery stent with a layer thickness of 100 microns and a weight of

just 2.97 grams. This component was made in under an hour and at a cost per part of just \$0.53. Dinsmore also 3D prints more complex components, like flow drivers, which take roughly six hours to produce and really make use of the Lumia X1’s high detail printing.

Kirill Tulinov, Lab Supervisor at Dinsmore, said: “It’s only a matter of time before people notice the importance of this collaboration of two technologies into one, DLP filling while you have the accuracy and surface finish of the laser.”

Laser Prototypes Europe

Belfast-based Laser Prototypes Europe (LPE), a veteran rapid prototyping service operating with clients across the UK and Ireland, exploits the large build volume of Axtra3D’s technology for the production of larger parts that still require fine details. The company, which offers SLA, SLS, DLP, and DMLS in addition to HPS 3D printing, appreciates the Lumia X1 for its high level of accuracy and larger build capacity, as well as its suitability for transitioning from design prototypes to functional parts.

Prinoa

German service bureau Prinoa, which specializes in dental devices like dental models, aligner molds, splints, and surgical guides, uses Axtra3D’s technology for the production of various components. The company reportedly increased its throughput by 40% by using HPS technology instead of DLP-only systems.

“Thanks to the extremely fast HPS process, we were able to increase our 3D printing capacities many times over, offer our customers completely new materials and thus take our



innovative manufacturing concept a further step forward," said Marcus Klab from Prinoa.

Prototek

At Prototek, a US-based digital manufacturing service that specializes in dental and medical devices, Axtra3D's platform is integral to its prototyping and low-volume production. The system's material versatility, speed, and high-quality finishes (of +/- 20 microns) were what drew the company to Axtra's hybrid technology.

As Ben DeGrave, Production Manager at Prototek, said: "Axtra3D's Lumia X1 technology that combines DLP speed with SLA sidewall quality, provides the best quality at fast speeds with broad new material options. The high accuracy rivals or surpasses competitors."

Repeatability, productivity, flexibility

Overall, there is no surprise why 3D printing service bureaus have embraced Axtra3D's technology. With broad material support—and the ability to validate new materials—as well as rapid printing rates, a high level of detail, and integrated process optimizations at every step, the Axtra Workflow is a reliable production tool for services of all kinds.

As the company continues to grow, with a particular focus on the EMEA region, and brings more materials into its validated portfolio, there is little doubt that more services will start adopting its technology and bringing its benefits to their respective customers.

