Nexa3D XiP

Fast, Easy, and Cost Effective

Bring Manufacturing and Prototyping Processes Inhouse with Nexa3D XiP Additive Manufacturing System

Executive Summary

Introduction

You want to bring prototyping and manufacturing inhouse, but you don't have the knowledge or resources. You don't like giving up control or taking on the existential risks that come with relying on a third-party, but you have to—it's the only way you can afford to.

That is, until now.

With additive manufacturing (AM) technology, you can eliminate the need for costly and complicated manufacutring processes (like injection molding), so you can build your prototypes and manufacture parts in-house. Not only does this allow you to take complete control over the process, but it also provides you with a level of flexibility that you've never experience before. With AM prototyping and manufacturing in house, you can make last-second revisions and keep a close eye on jobs to correct problems the second they come to light—not after 500 units are built. On top of that, bringing the process in-house decreases your cost per part and time to part (even when dealing with complex parts) and shields you from existential threats, such as sharing proprietary information with someone outside of the company.
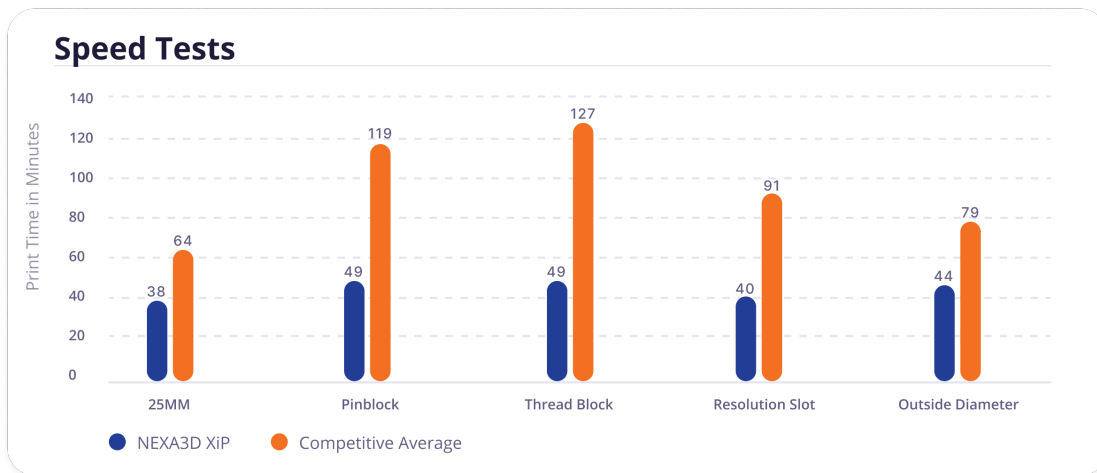
But not all AM systems are created equal. Some are faster or more accurate than others. Some are very expensive and complicated, and some are limited in what they can do. One AM solution can handle your needs, but the wrong system can be a detriment to your business.

In this report, we use Keypoint Intelligence's AM Lab Testing data to show future-thinking, growth-oriented businesses that the Nexa3D XiP is the right AM system for bringing prototyping and manufacturing processes in house.

FAST BUILD TIMES

The Nexa3D XiP is built with speed in mind. A Vat Photopolymerization masked stereolithography (mSLA) device, it uses UV light to cure resin one layer at a time. In general, mSLA AM systems are much faster than traditional Vat Photopolymerization Stereolithography (SLA) AM systems. That is because mSLA cures one entire layer simultaneously using an LCD screen as a mask, while SLA uses a laser to raster each point of each layer at a time. The device also leverages Sublayer Photo-curing (SPLc) technology to reduce wasted motion and eliminate "peel" forces that can slow down other print systems and have a negative impact on output quality.

Print Times using Default Settings and xCE Black Photopolymer Resin

Speed Tests

	NEXA3D XiP	Competitive Average
25MM	38	64
Pinblock	49	119
Thread Block	49	127
Resolution Slot	40	91
Outside Diameter	44	79

Print Time in Minutes

The Nexa3D XiP is faster than its competitors, according to Keypoint Intelligence's AM Speed Test results. The device built Keypoint Intelligence's test objects faster than all the devices in its competitive group. Not only can the Nexa3D XiP accelerate your time to part faster than a third-party, but it can also do it faster than other competing AM systems that can be used for manufacturing and prototyping.

EXCELLENT OUTPUT QUALITY

Accuracy is key in Additive Manufacturing, especially when building usable parts and prototypes. Objects that are not printed to spec are useless—you must throw them away and start the process all over again—which means projects take longer, costs increase, and your margins suffer.

In Keypoint Intelligence's 25MM block output quality assessment, the Nexa3D XiP hit the aim on the X and Y axes but was lower than the aim on the Z axis. In other words, the Nexa3D XiP was able to match the performance of the competitive average while completing the job nearly twice as fast.

25MM Block Using Default Settings and xCE Black Photopolymer Resin

25MM Block
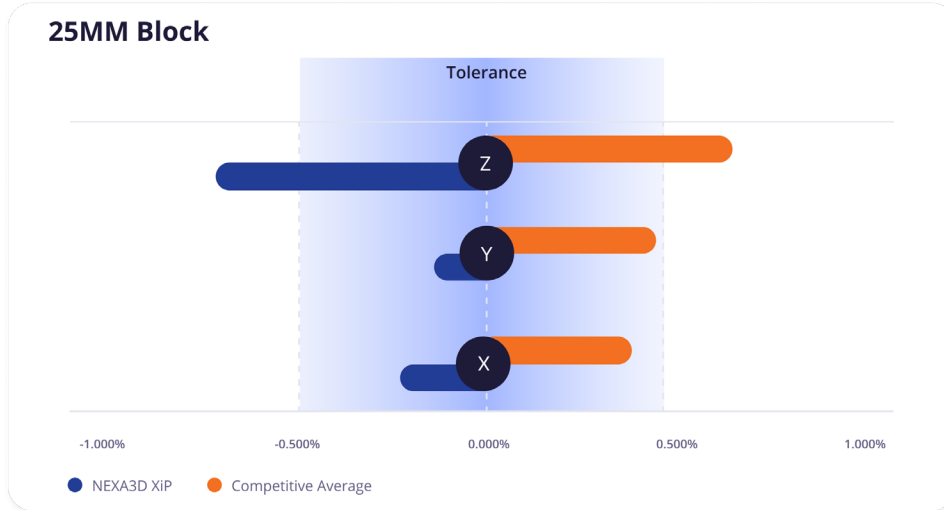
The Nexa3D XiP outperformed the competitive average during the ISO/ASTM 52902:2019(E) ASTM Resolution Slot test object--both in object accuracy and in build time. The Nexa3D XiP hit the aim for each slot measured except for one (the 2mm slot) whereas the competitive average higher than aim for the 2mm and 1mm slots. So compared to other devices, you can rely on it for a higher degree of feature detail from the Nexa3D XiP. But more importantly, the Nexa3D XiP's ability to hit the aim of the 1mm indicates that the device can handle the fine details required to replace some injection molding processes.
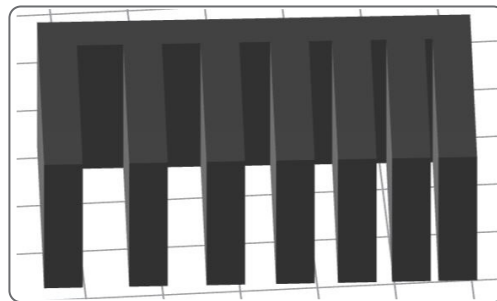

ISO/ASTM 52902:2019(E) Resolution Slot Using Default Settings and xCE Black Photopolymer Resin

ASTM Resolution Slot
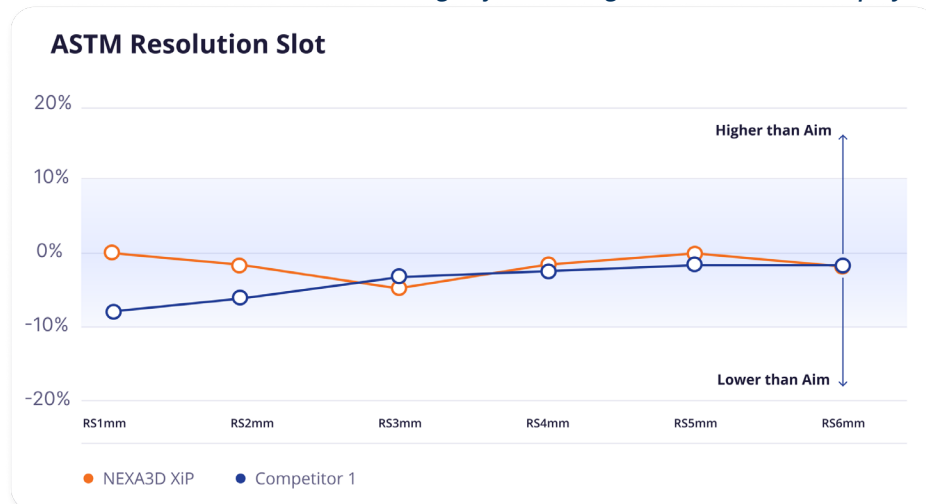
To see which devices can be relied upon to create a batch of objects quickly and efficiently, we measured how long it takes for the Nexa3D XiP to complete a batch of five 25mm cubes. We also measured the accuracy and consistency of each object created. Speeds, accuracy, and consistency were then compared to other industrial AM systems that we have tested in the past.

Consistent with results in the 25mm solo block test, both the Nexa3D XiP and competitive average hit the aim on the X and Y axes but were lower and higher than aim on the Z axis, respectively. While output quality results were the same, the Nexa3D XiP was able to complete the test in about 25% of the time.

While accuracy could be improved, the Nexa3D XiP proved that it can be used to bring low-volume mass production of simple objects in house.
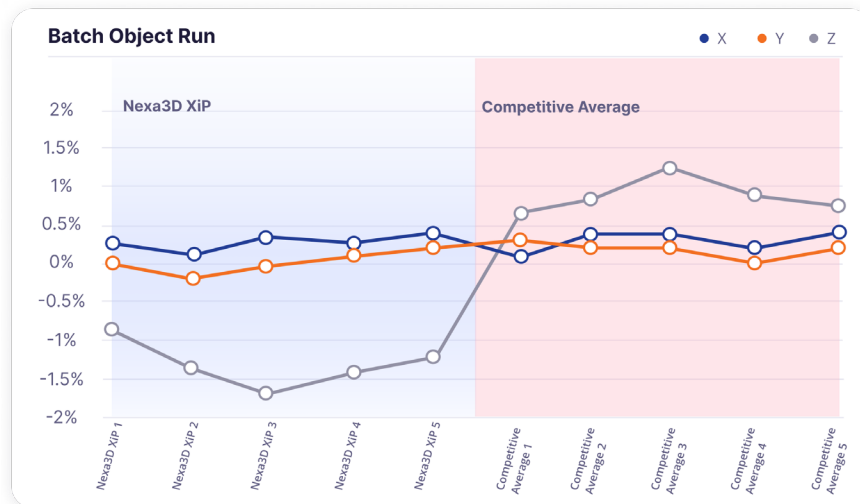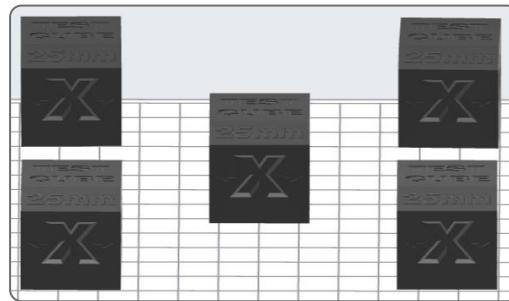
Normally, there is a tradeoff between build speed and accuracy. But based on the results of Keypoint Intelligence's AM Lab Testing, this is not the case with the Nexa3D XiP. The Nexa3D XiP was able to build Keypoint Intelligence's test objects between 1.7 and 2.6 as fast as the competitive average while beating or matching its output accuracy.

EXTENSIBLE LIBRARY OF MATERIALS TO SUPPORT A WIDE VARIETY OF PROCEDURES

The Nexa3D XiP supports a variety of resins that can handle different industrial needs, like injection mold tooling, end use parts, and creating prototypes for a variety of environments. Unlike other AM systems, the Nexa3D XiP supports third-party resins.

You can purchase an annual subscription to Nexa Pro, which unlocks a fully open resin architecture. The expanded resin ecosystem allows you to use resins based on what is best for the job instead of what is supported by the machine. You can tweak device settings that you would not be able to see using the standard version of Nexa X, so you can make tiny settings adjustments that lead to huge improvements in your finished product.

Library of Materials

Material	Use Case(s)	Characteristics	
x45	• Rapid modeling • Functional prototyping	• Fast build speed using draft mode • 52 MPa Tensile Strength	• 95 MPa Flex Strength • 20 J/m Notched Izod
xMODEL15	• Modeling • Multi-iteration prototyping	• Fine feature detail and smooth surface finish • 48 MPa Tensile Strength	• 49 MPa Flex Strength • 36 J/m Notched Izod
xMODEL17	• Lighting • Optics prototyping	• Clear resin is rigid and durable • 30 MPa Tensile Strength	• 97 MPa Flex Strength • 47 J/m Notched Izod
xMODEL35	• Functional prototyping • Models in high-temp or high-moisture environments	• Better than average heat deflection and low moisture absorption • 62 MPa Tensile Strength • 108 MPa Flex Strength • 21 J/m Notched Izod	
xPRO410	• Display models • Model verification	• Ideal for applications where accuracy and resolution are critical • 41 MPa Tensile Strength • 25 J/m Notched Izod	
xPP405	• Model verification • Functional prototyping • End-use parts	• Tough and impact resistant resin with weather and UV resistant qualities • 35 MPa Tensile Strength • 45 MPa Flex Strength • 62 J/m Notched Izod	
xABS3843	• Model verification • Functional prototyping • End use parts	• Ideal for FIM applications • 32 MPa Tensile Strength	• 30 MPa Flex Strength • 54 J/m Notched Izod
xCE	• Functional prototypes for high-temp environments • Low-volume IM inserts in low-temp environments • End use parts	• Ideal for parts and prototypes in high- and low-temp environments • 69 MPa Tensile Strength • 135 MPa Flex Strength • 20 J/m Notched Izod	
xPEEK147	• End use parts • Tools and molds that require thermal stability	• Ideal for environments that require heat resistant materials • 75 MPa Tensile Strength • 130 MPa Flex Strength • 15 J/m Notched Izod	
xCERAMIC3280	• Tooling • Wind tunnel models	• Ceramic composite resin for high heat environments • 40 MPa Tensile Strength	
xESD	• Electronics housing • Jigs and fixtures for electronics handling and assembly	• Ideal for manufacturing parts that will be used in electronic appliances • 68 MPa Tensile Strength • 97 MPa Flex Strength • 24 J/m Notched Izod	
xFLEX402	• Functional prototypes • Rubber-like production parts	• Perfect for environments where elongation and tensile strength are important • 230% Tensile elongation • 35% Energy Return	
xFLEX475	• Elastromeric applications	• Ideal for environments where resilience, snap back, and tear resistance is required • 150% Tensile elongation • 47% Energy Return • 7.3 kN/m Tear Strength	

The Nexa3D XiP supports authorized third-party resins standard. Nexa customers can also purchase an annual subscription to Nexa Pro to unlock a fully open resin architecture. The expanded resin ecosystem provides dentists with a choice to use resins based on what is best for (or preferred by) the patient, and expands the number of procedures they can replace or augment with AM. Other AM systems require customers to pay extra for an open resin printing system if the option is available at all.

SIMPLE AND EASY USER EXPERIENCE

You do not have to be a 3D printing whiz to use the Nexa3D XiP in your manufacturing and prototyping. The device is very easy to setup, use, and maintain, and it doesn't take long to get familiar with. The device even comes with features that can automate tedious, difficult job setup tasks that can take a long time to handle manually (and lead to failed prints if not done correctly).

Unlike other VP devices on the market, the Nexa3D XiP uses a resin cartridge and automated tank fill system. Resin comes in cartridges, which are loaded into a designated slot on the machine. Each cartridge is keyed, so the device can detect the type of resin the user loaded and automatically apply the appropriate settings. When it is time to print, the Nexa3D XiP automatically dispenses the correct amount of resin into the tank.

With other devices, you must manually measure and pour resin into the tank and adjust the settings accordingly for each job. Not only can this be time consuming and messy, but it can also cause prints to fail due to over/underfilling the vat, an improper job configuration, or both.

Nexa X—free bundled software that enables users to configure settings and kickoff jobs— comes with several features that automate complex job configuration tasks, such as the ability to detect/repair problems within the submistted print file, arrange how objects will be printed on the build plate, and generate rafts and supports for each object. Nexa X can nest and multiply objects, and automatically configure how to layout objects on the build plate to maximize the number of objects you can complete in a single job. By automating these tasks, you do not need to learn any new, specialized skills. In fact, Nexa X makes starting a job so easy, everyone—even those who are not tech savvy—in your shop can be trained to use it. The Nexa3D XiP has simplified the 3D print workflow to a three-step process: load your resin cartridge, load your file, and press start—the Nexa3D XiP handles the rest.

KEYPOINT INTELLIGENCE'S EXPERT OPINION

The Nexa3D XiP excels in three areas, which make it the ideal fit in manufacturing and prototyping environments. The Nexa3D XiP is fast and accurate, so it can be relied upon to build what is needed quickly. It is open and versatile, so you can avoid the high costs of vendor lock-in and use the resin that's best for the job. And despite the sophisticated nature of 3D printing, the device is very easy to setup, and even easier to use. Based on the results of Keypoint Intelligence's AM Lab Tests, the Nexa3D XiP is an outstanding choice for businesses that want to bring some manufacturing and prototyping processes in house.

About Keypoint Intelligence

For over 60 years, clients in the digital imaging industry have relied on Keypoint Intelligence for independent hands-on testing, lab data, and extensive market research to drive their product and sales success. Keypoint Intelligence has been recognized as the industry's most trusted resource for unbiased information, analysis, and awards due to decades of analyst experience. Customers have harnessed this mission-critical knowledge for strategic decision-making, daily sales enablement, and operational excellence to improve business goals and increase bottom lines. With a central focus on clients, Keypoint Intelligence continues to evolve as the industry changes by expanding offerings and updating methods, while intimately understanding and serving manufacturers', channels', and their customers' transformation in the digital printing and imaging sector.