

nexa3D<sup>®</sup>  
keystone  
industries

# CASE STUDY

**Efficient, Fast,  
Accurate, and  
Profitable Dental  
Production with  
Nexa3D NXD 200 +  
Keystone Industries'  
KeyPrint<sup>®</sup> 3D Resins**



# BACKGROUND

Keystone Industries, a privately held US company founded in 1908, manufactures thousands of dental products as well as its own KeyPrint line of photopolymer 3D printing resins. Its group of dental companies focuses largely on consumable digital, laboratory, operator, and preventative products. The company is a global supplier, maintaining a diverse network of more than 800 US and international dental distribution partners in more than 70 countries.

As an open-source resin supplier, Keystone partners with as many 3D printer manufacturers as possible, after rigorously validating each printer to ensure it meets the necessary accuracy and quality parameters. All of its liquid resins are designed for use with the Digital Light Processing (DLP) process, which cures the part using a UV image. Keystone's KeyPrint resins cover a wide range of dental applications such as splints, models, surgical guides, and indirect bonding trays.

## Validated Resin Partner

Keystone Industries

## Industry

Dental

## Product

NXD 200

## Applications

Ideal for high-volume production of models, surgical guides, splints, trays, and night guards by dental labs

## Advantages

- Among the fastest dental 3D printers, with exceptionally large build area
- High-volume throughput
- Excellent accuracy and repeatability
- Affordable lab-scale printer offering a lower cost of overall ownership

## Learn More

[keyprint.keystoneindustries.com](https://keyprint.keystoneindustries.com)



*This is the definition of higher throughput. If you run the printer all day, you're looking at over 200 splints in an eight-hour day, while most other dental printers would need significantly more time to achieve that volume of parts."*

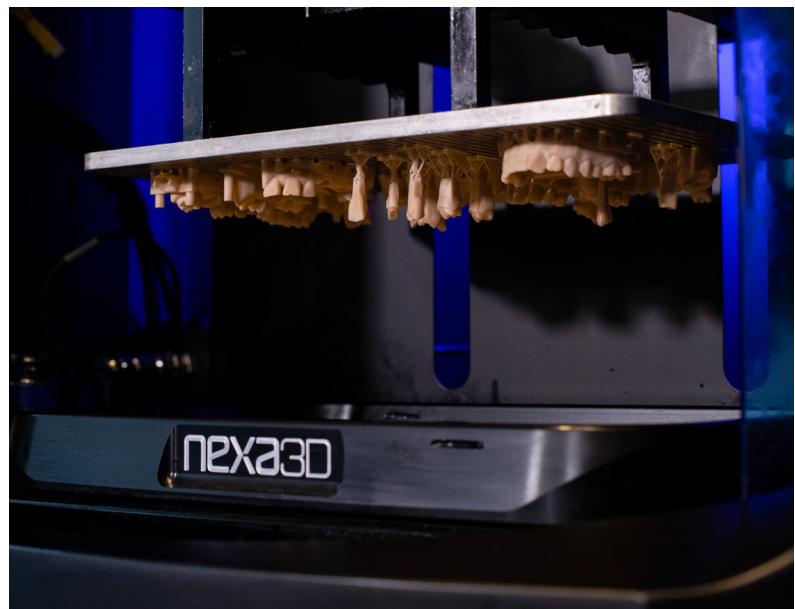
**– Benjamin Taylor  
3D Printing Engineer and Lab  
Manager, Keystone Industries**



## CHALLENGE

While the company already works with nearly two dozen 3D printer partners, Keystone faced the challenge of meeting the high-volume throughputs demanded by busy dental labs. Labs make their money by doing the manufacturing for the doctors. While demand for 3D printed dental products continues to surge, the labs are constrained by the size and throughput limitations of their 3D printers.

The simplest solution would seem to be for a growing lab to simply buy more printers, notes Keystone 3D printing engineer and lab manager Benjamin



Taylor. But that translates into more expense, more maintenance, and the need for more space. The preferred approach is to use faster, larger-volume 3D printers and to keep them constantly pumping out product.

## **SOLUTION**

Nexa3D's NXD 200 currently has the biggest build volume in the dental 3D printing market, Taylor says, meaning that lab operators are able to print more product at one time. The NXD 200 platform combines a superior build volume of 8.5 liters (measuring 10.8 in x 6.1 in x 7.8 in), extreme print uniformity, modular design for onsite automation, 4K resolution, and intelligent print optimization software.

In mid-2021 Keystone began evaluating the NXD 200 printer, and as of early 2022 has validated six of its resins for use with the system. The result has been "a game-changer." With this printer model – which is five to six times larger than many competitive printers – a KeyPrint user can print 32-36 full arch splints (depending on the print orientation) with the KeySplint

Hard resin in 76 minutes, and 16 flat dental models with KeyModel Ultra resin in less than 30 minutes. Other DLP printers can't even hold 32 splints on one build plate at a time, Taylor says, so it would take two complete prints to match just one Nexa3D print, part wise. "This is the definition of higher throughput. If you run the printer all day, you're looking at over 200 splints in an eight-hour day, while most other dental printers would need significantly more time to achieve that volume of parts," Taylor notes.

Additionally, he notes, the NXD 200 "meets or exceeds accuracy standards, offers one of the best print speeds in the market, checks in at an affordable price, and comes with solid tech support."

Powered by Nexa3D's proprietary Lubricant Sublayer Photo-curing (LSPc) technology, the large build plate and repeatable accuracy of the prints make this 3D printer a viable production-level option that stands to help drive greater output and increased profitability for today's busy dental labs.



# MATERIALS

Keystone provided testing data for KeyPrint performance in the NXD 200:

## KeySplint Soft & Hard

- produces splint samples ~25% faster (KSS) & ~50% faster (KSH) than most printers
- can nest ~60% more splints

## KeyGuide

- meets and/or exceeds Surgical Guide accuracy standards
- produces KeyGuide samples 29% faster than most printers
- can nest 25% more surgical guides

## KeyModel Ultra

- meets and/or exceeds Model accuracy standards
- produces KeyModel Ultra samples ~20% faster than most printers
- can nest ~40% more models

## KeyTray

- produces KeyTray samples ~50% faster than most printers
- can nest ~25% more trays

## KeyOrtho IBT

- produces IBT samples ~45% faster than most printers
- can nest 2x the amount of IBT samples





## Upgrade Additive Manufacturing



### About Nexa3D

Nexa3D is passionate about digitizing supply chain sustainably. The company makes ultrafast polymer 3D printers, that deliver 20X productivity advantage, affordable for professionals and businesses of all sizes. The company partners with world-class material suppliers to unlock the full potential of additively manufactured polymers for volume production. The company makes automated software tools that optimize the entire production cycle using process interplay algorithms that ensure part performance and production consistency, while reducing waste, energy and carbon footprints. For more information, please visit [www.nexa3d.com](http://www.nexa3d.com).

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