

# NXE 200Pro + KeyPrint® Resins - a High Throughput 3D Printing “Game Changer” for Dental Labs

CASE STUDY

**Customer**

Keystone Industries

**Industry**

Dental

**Products**

NXD 200

**Application**

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

**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.

**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.

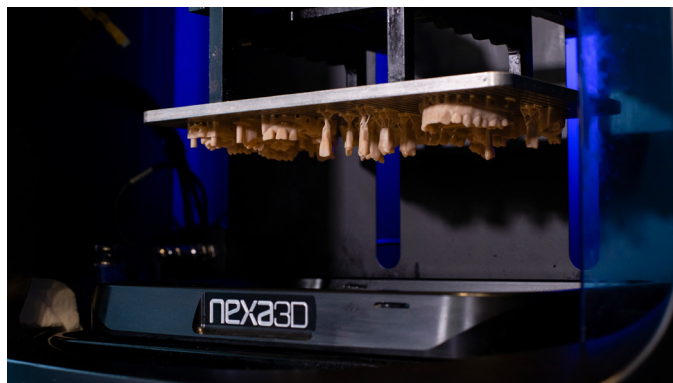
“The simplest solution would seem to be for a growing lab to simply buy more printers,” notes Keystone 3D printing engineer and lab manager Benjamin Taylor. “But that translates into more expense, more maintenance, and the need for more space. The preferred approach is to use faster, larger-volume 3D 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, meaning that lab operators are able to print more product at one time,” Taylor says. 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 3D printer from Nexa3D, and as of early 2022 has validated six of its resins for use with the system. The result has been “a game-changer” at 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.”

## 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

