

nexa3D®

2023 Material Guide for Ultrafast 3D Printing



xABS



xPP



xMODEL



xPEEK



xCERAMIC



xESD



xFLEX475



x45



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Introduction

When it comes to 3D printing, speed is a game changer and in 2023 that is all the more true. With the right mix of modeling and engineering materials (not to mention dental), you can produce flawless prototypes in minutes and even batches of hundreds of real production parts in just hours.

In this guide we will explore the wide range of materials that serve as a medium for your strong, flawless, durable, heat-resistant, ESD, flexible, (you get the idea) parts, and the cutting edge technologies that enable ultrafast, high throughput 3D printing. We'll also tell you the real-world stories of companies and individuals like you who are reliably producing parts with these materials on Nexa3D printers.

Resin 3D Printing

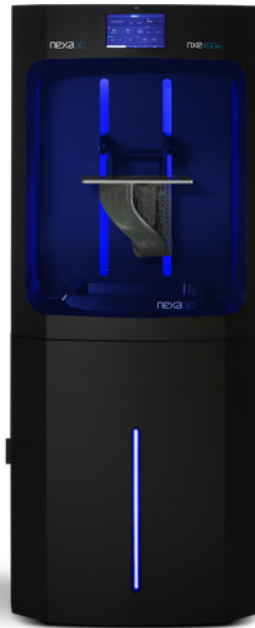
featuring LSPc® Technology

Resin 3D printers are well known for their capabilities – producing high detail parts with exceptional surface finish, but today’s resin 3D printers go far beyond just pretty parts. With a growing landscape of high performance materials, and advanced technologies like Nexa3D’s Lubricant Sublayer Photo-curing Technology – resin parts can outperform even some of the best known manufacturing polymers, and can be produced at unparalleled speeds.



[XiP](#)

XiP brings ultrafast 3D printing to the desktop. Utilizing the industrial light engine and proprietary LSPc membrane technology of the NX Pro Series, XiP is capable of printing production grade parts at lightning speeds - all in a compact and easy to use package.



[NXE 400Pro](#)

NXE 400Pro brings unmatched throughput to the industrial space. With 17 liters of build volume, you can mass produce hundreds of small nested and large single parts in hours, not days.



[NXD 200Pro](#)

NXD 200Pro is one of the fastest dental 3D printers on the market. Capable of producing 20 orthodontic models in just 30 minutes with pinpoint accuracy in a wide variety of certified dental resins.

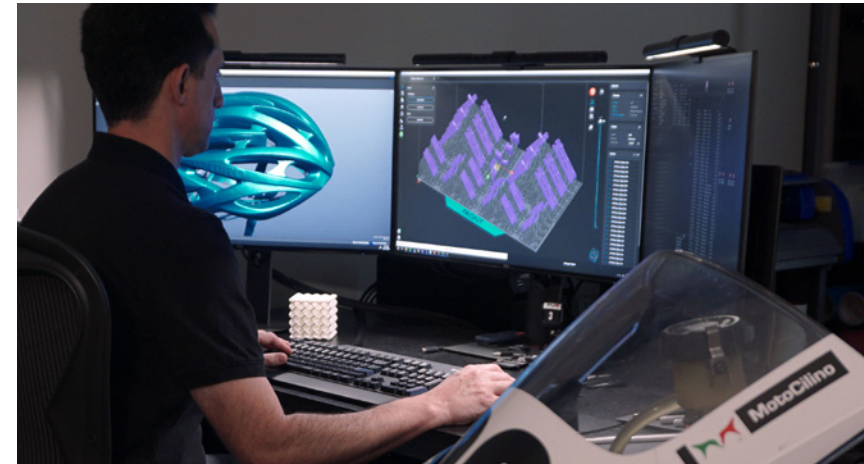
General Purpose Resins

General purpose resins are commonly used for prototyping. They tend to produce a high level of detail, smooth surface finish, and optimal color or clarity. In many cases these also tend to be some of the fastest printing resins making them ideal for iterative design and testing.



Kaden

Czech-based Kaden is a Toy Manufacturer that utilizes xPRO410 on their NXE 400 system to prototype and mass produce parts for their die-cast toy trucks allowing them to streamline their new product development and manufacturing processes simultaneously.



MotoCilino

MotoCilino is a US-based engineering consulting firm that develops new products for clients in a variety of industries including consumer electronics, automotive, government, and medical devices. xPRO410 and x45 resins paired with XiP have accelerated their prototyping throughput by 600%.

x45

A tough material that is ideal for models and functional prototypes requiring high strength and durability. Capable of much higher print speeds than current materials, x45 features excellent out-of-printer properties with robust print styles to ensure high first-time build success. Supporting a wide variety of applications with short processing times, x45 draft build mode offers companies greater flexibility within their manufacturing processes.

Colors

Natural | Clear | Black

Manufacturing Partner

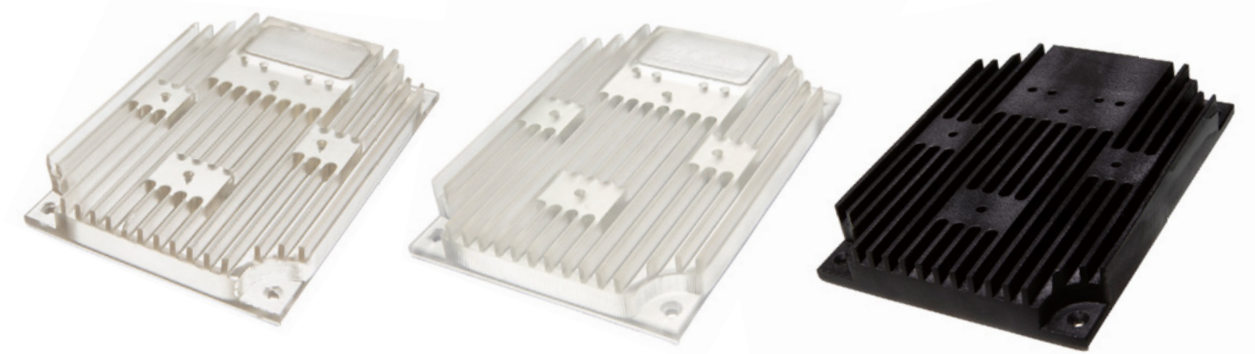
BASF Forward AM

Characteristics

- Draft build mode enables remarkable build speed
- Robust print styles ensure high first-time build success
- Excellent out-of-printer properties and multiple colors support a wide variety of modeling and prototyping applications

Uses

- Fast turnaround modeling and prototyping
- Models and prototypes requiring good optical clarity or matte black finish
- Functional prototypes requiring good strength and toughness



Property	Natural	Clear	Black
Tensile Modulus (ASTM D638)	1600 MPa	1600 MPa	1600 MPa
Ultimate Tensile Strength (ASTM D638)	52 MPa	52 MPa	52 MPa
Tensile Elongation at Break (ASTM D638)	12 %	12 %	12 %
Flex Modulus (ASTM D790)	2100 MPa	2100 MPa	2100 MPa
Flex Strength (ASTM D790)	95 MPa	95 MPa	95 MPa
Notched Izod (ASTM D256)	20 J/m	19 J/m	20 J/m
Water Absorption (ASTM D570)	6 %	6 %	6 %
Hardness Shore D (ASTM D2240)	85	85	85

xMODEL15

xMODEL15 is an economical modeling material that yields superb speed, productivity, and great surface finish quality. Those looking for next level finishes will be glad to know that the xMODEL15 is suitable for polishing, painting, and even plating. Most importantly, xMODEL15 is derived from plant-based materials, has low odor, and can be cleaned easily with water and soft brushing.

Colors

Black | Gray | White

Characteristics

- Fine feature detail
- Smooth surface finish
- Economical

Uses

- Visual models and prototypes
- Multi-iteration prototyping



Property	Black	Gray	White
Ultimate Tensile Strength (ASTM D638)	48 MPa	48 MPa	48 MPa
Tensile Elongation at Break (ASTM D638)	28 %	28 %	28 %
Flex Strength (ASTM D790)	49 MPa	49 MPa	49 MPa
Notched Izod (ASTM D256)	36 J/m	36 J/m	36 J/m

xMODEL17-Clear

xMODEL17-Clear is a rigid and durable modeling material with enhanced clarity, perfect for prototyping applications that require fine feature details and high-quality translucent or transparent surface finishes.

Colors

Clear

Characteristics

- Finishes to high optical clarity
- Fine feature detail
- Smooth surface finish
- Economical

Uses

- Lighting
- Optics prototyping



Property	Clear
Tensile Modulus (ASTM D638)	1213 MPa
Ultimate Tensile Strength (ASTM D638)	30 MPa
Tensile Elongation at Break (ASTM D638)	22 %
Flex Modulus (ASTM D790)	1467 MPa
Flex Strength (ASTM D790)	57 MPa
HDT @0.45 MPa (ASTM D648)	47 °C
Notched Izod (ASTM D256)	47 J/m
Water Absorption (ASTM D570)	0.24 %

xMODEL35

A rigid, high performance modeling resin that demonstrates excellent mechanical performance, good thermal properties, and low moisture absorption. The xMODEL35 produces crisp details, and makers will rest assured their work will retain dimensional accuracy when transported through extremes in temperature and humidity. Well-suited for high-quality functional models as well as many end-use applications, the xMODEL35 provides great first-time print success and achieves the fine detail and precision associated with Nexa3D's LSPc® technology.

Colors

Black | Gray

Manufacturing Partner

BASF Forward AM

Characteristics

- Above average heat deflection
- Low moisture absorption
- Exceptionally rigid for a modeling material

Uses

- Functional prototypes
- Models that will be exposed to elevated temperatures and/or moisture



Property	Black	Gray
Tensile Modulus (ASTM D638)	2600 MPa	2600 MPa
Ultimate Tensile Strength (ASTM D638)	62 MPa	62 MPa
Tensile Elongation at Break (ASTM D638)	10 %	10 %
Flex Modulus (ASTM D790)	2300 MPa	2300 MPa
Flex Strength (ASTM D790)	108 MPa	108 MPa
HDT @0.45 MPa (ASTM D648)	87 °C	87 °C
Notched Izod (ASTM D256)	21 J/m	21 J/m
Water Absorption (ASTM D570)	0.4 %	0.4 %
Hardness Shore D (ASTM D2240)	83	83

xPRO410

Rigid photoplastic that prints parts with extreme accuracy and an exceptional surface finish. Formulated based on Henkel's LOCTITE® PRO410 polymer and optimized for Nexa3D's NXE 400Pro 3D printer, the material is ideal for general purpose prototyping and series production.

Colors

Black

Manufacturing Partner

Henkel

Characteristics

- Mid-range stiffness
- Fast build speed
- Excellent accuracy and aesthetics
- Lower part cost

Uses

- Quick design verification models
- Display models
- Models where accuracy and resolution are critical



Property	Black
Tensile Modulus (ASTM D638)	2365 MPa
Ultimate Tensile Strength (ASTM D638)	41 MPa
Tensile Elongation at Break (ASTM D638)	5.5 %
HDT @ 0.45 MPa (ASTM D648)	61 °C
Notched Izod (ASTM D256)	25 J/m
Water Absorption (ASTM D570)	0.46 %
Hardness Shore D (ASTM D2240)	79

Engineering Resins

Engineering resins have seen a major improvement over the last couple of years. Specialty resins are available for applications ranging from high temp molding tools, to versatile ABS-like production materials, to ESDs, and some unbelievably flexible rubber-like elastomers. These high-performance resins are enabling true-manufacturing with resin 3D printers.



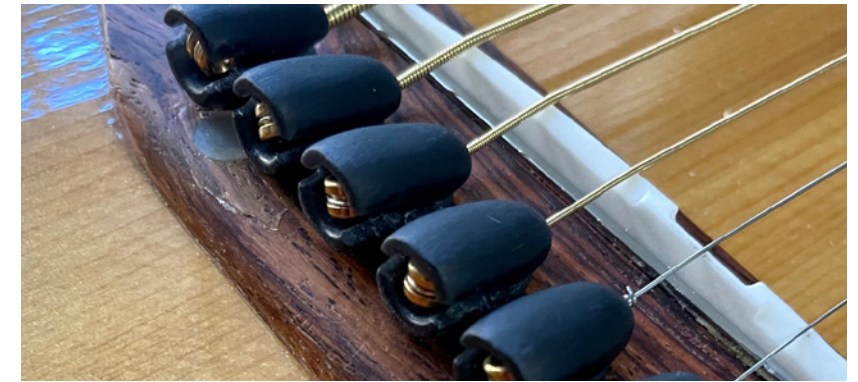
Alstom

Alstom is an Italy-based rolling stock manufacturer that manufactures train cars for some of the world's largest rail agencies. They were able to manufacture hundreds of passenger footrests to replace designs that were no longer available from suppliers using xCE resin with their NXE 400 3D printer.



PepsiCo

PepsiCo was able to reduce their bottle production costs by 96% by switching to 3D printed blow mold tooling. For the blowmold tools they 3D print the xPEEK147 resin on their NXE 400 3D printers - a complete mold set can be ready in just 12 hours compared to several weeks for a machined tool.



Liquid Sound Technologies

Liquid Sound Technologies is a manufacturer of acoustic accessories. With the xCE resin and their XiP desktop 3D printer, they were able to reduce production costs 90% and go from a 9 month lead time with 10,000 minimum order size, to one day lead time with no minimum order size. The xCE is replacing machined brass parts and needs to withstand high force loads.

xPP405

A tough, impact-resistant material with a modulus similar to molded unfilled polypropylene. Exhibits excellent weathering characteristics and UV stability making it suitable for end-use part applications.

Colors

Clear | Black

Manufacturing Partner

Henkel

Characteristics

- Tough, impact-resistant material with a modulus similar to molded unfilled polypropylene
- Good weathering
- Smooth black surface finish

Uses

- Design verification models
- Functional prototypes
- End-use parts including packaging, piping, and consumer and industrial applications, including large housings and enclosures



Property	Black	Clear
Tensile Modulus (ASTM D638)	1300 MPa	1300 MPa
Ultimate Tensile Strength (ASTM D638)	35 MPa	35 MPa
Tensile Elongation at Break (ASTM D638)	100 %	100 %
Flex Modulus (ASTM D790)	1300 MPa	1300 MPa
Flex Strength (ASTM D790)	45 MPa	45 MPa
HDT @0.45 MPa (ASTM D648)	53 °C	53 °C
Notched Izod (ASTM D256)	62 J/m	62 J/m
Water Absorption (ASTM D570)	1 %	2 %
Hardness Shore D (ASTM D2240)	80	79

xABS3843

Tough and durable material with the aesthetics of injection molded black ABS. High performance, high modulus material boasting excellent flexural and tensile physical properties with a relatively high degree of elongation. It displays high green strength and good heat deflection temperature enabling it to print accurately and function in a wide variety of applications. It has been tested in QUV exterior weathering conditions (ASTM G-154) for 800 hours with less than a 15% change in Tensile and IZOD Impact properties.

Colors

Black

Manufacturing Partner

Henkel

Characteristics

- ABS-like stiffness
- Tough & durable
- Great feature detail

Uses

- Design verification models
- Functional prototypes
- Snap fits
- Jigs and fixtures
- Patterns
- End use parts
- Good weathering performance



Property	Black
Tensile Modulus (ASTM D638)	1400 MPa
Ultimate Tensile Strength (ASTM D638)	32 MPa
Tensile Elongation at Break (ASTM D638)	50 %
Flex Modulus (ASTM D790)	1400 MPa
Flex Strength (ASTM D790)	30 MPa
HDT @0.45 MPa (ASTM D648)	56 °C
Notched Izod (ASTM D256)	54 J/m
Water Absorption (ASTM D570)	2.3 %
Hardness Shore D (ASTM D2240)	86

xCE

High stiffness and temperature materials with the aesthetics and environmental longevity of injection molded nylons, polyesters, polyamides and polyimides. xCE is proven for production parts in the field, including in harsh outdoor exposure with sun, humidity, and heat.

Colors

Black | White

Characteristics

- High-performance plastic stiffness
- High temperature
- Durable, resistant to chemicals

Uses

- Functional prototypes subject to higher temperature evaluations
- Low volume injection molding inserts for lower temperature plastics
- End use parts



Property	Black	White
Tensile Modulus (ASTM D638)	2840 MPa	2840 MPa
Ultimate Tensile Strength (ASTM D638)	69 MPa	69 MPa
Tensile Elongation at Break (ASTM D638)	8 %	8 %
Flex Modulus (ASTM D790)	3250 MPa	3250 MPa
Flex Strength (ASTM D790)	135 MPa	135 MPa
HDT @0.45 MPa (ASTM D648)	87 °C	87 °C
Notched Izod (ASTM D256)	20 J/m	20 J/m
Water Absorption (ASTM D570)	0.4 %	0.4 %
Hardness Shore D (ASTM D2240)	89	89

xPEEK147

A stiff, heat-resistant material with a HDT of 230°C similar to many PAEK thermoplastics like PEEK. Exhibits excellent long-term stability at temperatures exceeding 100°C making it suitable for prototypes and end-use parts subjected to high temperatures and fast tooling for plastic molding.

Colors

Black

Manufacturing Partner

Henkel

Characteristics

- High heat deflection temperature
- High stiffness with good dimensional stability
- Good surface finish

Uses

- High performance prototypes or end use parts requiring high temperature capability and long-term thermal stability
- Tools and molds requiring good surface and long-term thermal stability >125°C



Property	Black
Tensile Modulus (ASTM D638)	3190 MPa
Ultimate Tensile Strength (ASTM D638)	75 MPa
Tensile Elongation at Break (ASTM D638)	3 %
Flex Modulus (ASTM D790)	3170 MPa
Flex Strength (ASTM D790)	130 MPa
HDT @0.45 MPa (ASTM D648)	238 °C
Notched Izod (ASTM D256)	15 J/m
Water Absorption (ASTM D570)	0.2 %
Hardness Shore D (ASTM D2240)	94

xCERAMIC3280

xCERAMIC3280 is a ceramic composite resin that produces rigid parts with high heat deflection temperature and excellent tensile modulus at some of the highest speeds of any material class. The new xCERAMIC3280 resin is a perfect choice for tooling applications, wind tunnel testing models, and products that require a ceramic look and feel.

Colors

White

Manufacturing Partner

BASF Forward AM

Characteristics

- High heat deflection
- High speed printing
- Very high rigidity
- Ceramic look and feel

Uses

- Tooling
- Wind tunnel models



Property	White
Tensile Modulus (ASTM D638)	9410 MPa
Ultimate Tensile Strength (ASTM D638)	40 MPa
Tensile Elongation at Break (ASTM D638)	0.5 %
HDT @0.45 MPa (ASTM D648)	280 °C
Water Absorption (ASTM D570)	0.29 %
Hardness Shore D (ASTM D2240)	96

xESD

xESD is a rigid photoplastic with a stable carbon nanotube dispersion that delivers optimal static-dissipative performance and isotropic mechanical properties required by the electronics manufacturing industry. The xESD resin allows users to create custom jigs, fixtures, grippers, assembly aides, and enclosures in hours without the risk of ESD damage to high-value electronic components.

Colors

Black

Characteristics

- Electronic static dissipative
- High rigidity
- Above average heat deflection

Uses

- Electronics housings
- Jigs and fixtures for electronics handling and assembly



Property	Black
Tensile Modulus (ASTM D638)	2600 MPa
Ultimate Tensile Strength (ASTM D638)	68.1 MPa
Tensile Elongation at Break (ASTM D638)	3.8 %
Flex Modulus (ASTM D790)	1800 MPa
Flex Strength (ASTM D790)	97.4 MPa
HDT @0.45 MPa (ASTM D648)	91.3 °C
Notched Izod (ASTM D256)	24 J/m
Hardness Shore D (ASTM D2240)	87

xFLEX402

xFLEX402 is a flexible material with firmer shore 76A durometer, high elongation at break and excellent tensile strength, ideal for functional prototyping applications of elastomeric components and production parts.

Colors

Black

Manufacturing Partner

Henkel

Characteristics

- Firm rubber-like
- High elongation at break

Uses

- Functional prototypes
- Rubber-like production parts



Property	Black
Tensile Modulus (ASTM D638)	42 MPa
Tensile Elongation at Break (ASTM D638)	230 %
Water Absorption (ASTM D570)	3.15 %
Hardness Shore A (ASTM D2240)	73
Energy Return	35 %

xFLEX475

A medium soft rubber-like material that cures to a soft, elastomeric finish. Customers can use this industrial strength material in applications that require resilience, snap back, and tear resistance, such as pipes and manifolds, handles and grips, seals and gaskets, or sportswear and footwear midsoles. This material also boasts an impressive 150 percent elongation at break, an excellent energy return of up to 50 percent, and resistance to most solvents.

Colors

Black | White

Manufacturing Partner

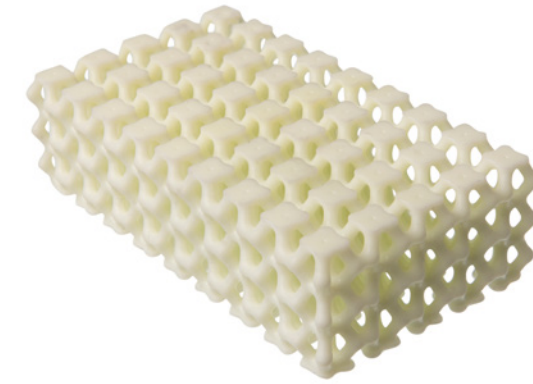
Henkel

Characteristics

- Soft elastic
- Single component with low viscosity

Uses

- Resilience, snap back and tear resistance elastomeric application



Property	Black	White
Tensile Modulus (ASTM D638)	3.7 MPa	4.6 MPa
Ultimate Tensile Strength (ASTM D638)	2.5 MPa	3.8 MPa
Tensile Elongation at Break (ASTM D638)	150 %	159 %
Hardness Shore A (ASTM D2240)	44	55
Energy Return	47 %	39 %
Tear Strength (ASTM D624)	7.3 kN/m	11.7 kN/m

Dental Resins

3D printing has become an invaluable tool in the dental and orthodontic industries due to the need for customized pieces. This demand has driven a range of highly productive dental resins capable of producing everything from models to guards, from guides to aligners.



Excel Orthodontics

Excel Orthodontics produce 150 - 200 orthodontic models per day using the KeyModel Ultra resin on their NXD 200Pro 3D printer. The process trades messy in-office ortho impressions, for quick and easy scans. From the scans 20 models can be printed in about 30 minutes.



KeyDental Technologies

KeyDental is another orthodontic lab who uses 3D printers for models, but their models are used to create their proprietary clear aligners. Using the xMODEL 2505 resin on their NXD 200 3D printer, they have been able to keep up with growing demand and produce 2100 models per month on just one 3D printer.

KeyModel Ultra™

KeyModel Ultra is a material designed for 3D printing of dental and orthodontic models.

Colors

Ivory

Manufacturing Partner

Keystone

Characteristics

- Accurate
- Easy thermoforming release
- Flawless detail
- Carve-able without chipping

Uses

- Dental thermoforming application (100µm)
- Dental removal die and model application (50µm)



Property	Ivory
Tensile Modulus (ASTM D638)	3.7 MPa
Ultimate Tensile Strength (ASTM D638)	2.5 MPa
Tensile Elongation at Break (ASTM D638)	150 %
Flex Modulus (ASTM D790)	44
Flex Strength (ASTM D790)	47 %
Hardness Shore D (ASTM D2240)	85

KeySplint Hard®

KeySplint Hard is a splint material that performs equal to the lab processed Lucitone 199 with excellent wear resistance without tearing or cracking, and excellent resistance to fatigue failure.

Colors

Clear

Manufacturing Partner

Keystone

Characteristics

- Biocompatible
- Strong
- Easy to Polish
- Easily cleaned
- Abrasion resistant

Uses

- Rigid dental splints
- Night guards



Property	Clear
Tensile Elongation at Break (ASTM D638)	9 %
Flex Modulus (ASTM D790)	1600 MPa
Flex Strength (ASTM D790)	65 MPa
Water Absorption (ISO 20795-2)	18 µg/mm ³
Biocompatibility (ISO 10993-5)	Pass

KeySplint Soft®

KeySplint Soft is a strong material for splints, night guards and bleaching trays.

Colors

Clear

Manufacturing Partner

Keystone

Characteristics

- Biocompatible
- Strong
- Flexible
- Easy to Polish
- Easily Cleaned

Uses

- Splints
- Night Guards
- Bleaching Trays (100µm)



510K Compliance

- This material has been validated as *Keystone Compatible* by Keystone Industries.
- Its specific workflows have been validated as compliant with Keystone Industries 510K filings and Keystone Industries guarantees that customers can produce safe and effective medical devices with a Nexa3D printer if the approved workflow is followed.
- See [here](#) for more information.



Property	Clear
Tensile Elongation at Break (ASTM D638)	110 %
Flex Modulus (ASTM D790)	1400 MPa
Flex Strength (ASTM D790)	47 MPa
Hardness (ASTM D2240)	85
Cytotoxicity (ISO 10993)	Pass
Irritation (ISO 10993)	Pass
Sensitization (ISO 10993)	Pass

KeyGuide®

KeyGuide is ideal for fabricating transparent surgical guides, allowing doctors to place implants at a precise angle and depth.

Colors

Translucent

Characteristics

- Biocompatible
- Strong
- Easy to polish
- Autoclavable

Uses

- Surgical guides (100µm)

510K Compliance

- This material has been validated as *Keystone Compatible* by Keystone Industries.
- Its specific workflows have been validated as compliant with Keystone Industries 510K filings and Keystone Industries guarantees that customers can produce safe and effective medical devices with a Nexa3D printer if the approved workflow is followed.
- See [here](#) for more information.



Property	Translucent
Flex Modulus (ASTM D790)	2400 MPa
Flex Strength (ASTM D790)	106 MPa
Biocompatibility (ISO 10993-5)	Pass
Biocompatibility (ISO 10993-10)	Pass

KeyTray™

KeyTray is a strong, biocompatible (Class I) 3D printing resin designed to create customized, individual impression trays quickly and with precision. The material is strong and durable to withstand the forces of taking a patient impression and removing the tray from the oral cavity. It is compatible with all types of impression material.

Colors

Lavender

Manufacturing Partner

Keystone

Characteristics

- Biocompatible
- Strong
- No preliminary casting required
- Improved impression accuracy
- Compound waxes and border molding materials will adhere to tray

Uses

- Customized impression trays (100µm)

510K Compliance

- This material has been validated as *Keystone Compatible* by Keystone Industries.
- Its specific workflows have been validated as compliant with Keystone Industries 510K filings and Keystone Industries guarantees that customers can produce safe and effective medical devices with a Nexa3D printer if the approved workflow is followed.
- See [here](#) for more information.



Property	Lavender
Tensile Modulus (ASTM D638)	2056 MPa
Ultimate Tensile Strength (ASTM D638)	62 MPa
Tensile Elongation at Break (ASTM D638)	26 %
Flex Modulus (ASTM D790)	1913 MPa
Hardness Shore D (ASTM D2240)	86

KeyOrtho IBT™

KeyOrtho IBT combines the strength and precision to accurately set brackets, with the flexibility and non-stick formula needed for easy release.

Biocompatible, tasteless, and odorless, KeyOrtho IBT is ideal for manufacturing indirect bonding trays. Drastically reduce chair time and increase patient comfort during the orthodontic bracket setting process.

Colors

Translucent

Manufacturing Partner

Keystone

Characteristics

- Biocompatible
- Tasteless
- Odorless
- Easy release
- Good strength

Uses

- Indirect bonding trays manufacturing



Property	White
Tensile Modulus (ASTM D638)	10.5 MPa
Ultimate Tensile Strength (ASTM D638)	31 MPa
Tensile Elongation at Break (ASTM D638)	130 %
Biocompatibility (ISO 10993-5)	Pass
Viscosity @ 25°C (cP)	< 1000
Orthodontic Adhesive Release	Pass

xMODEL 2505

xMODEL 2505 is a high resolution dental model material suitable for the ultrafast production of additively manufactured thermoformed dental models, dental removable dies, and other dental model applications.

Colors

Beige

Manufacturing Partner

BASF Forward AM

Characteristics

- High resolution
- Strong and rigid

Uses

- Dental models
- Dental removable dies
- Other model applications



Property	Beige
Tensile Modulus (ASTM D638)	2500 MPa
Ultimate Tensile Strength (ASTM D638)	54 MPa
Tensile Elongation at Break (ASTM D638)	4%
Flex Modulus (ASTM D790)	2100 MPa
Flex Strength (ASTM D790)	8300 MPa
Hardness Shore D (ASTM D2240)	73

Powder 3D Printing

featuring QLS Technology

Powder bed fusion 3D printers are already manufacturing power houses, providing robust, high performance parts for a variety of industries and applications. New technologies such as Nexa3D's Quantum Laser Sintering (QLS) take powder bed 3D printing to the next level with extreme throughput.



QLS 820

Excel Orthodontics produce 150 - 200 orthodontic models per day using the KeyModel Ultra resin on their NXD 200Pro 3D printer. The process trades messy in-office ortho impressions, for quick and easy scans. From the scans 20 models can be printed in about 30 minutes.



SmartDrone

KeyDental is another orthodontic lab who uses 3D printers for models, but their models are used to create their proprietary clear aligners. Using the xMODEL 2505 resin on their NXD 200 3D printer, they have been able to keep up with growing demand and produce 2100 models per month on just one 3D printer.

PA11

PA11 is a white to off-white nylon plastic derived from a renewable source (castor oil). It has great chemical resistance and superior toughness compared to PA12, including high impact strength, as well as improved elongation. It is ideal for production manufacturing applications that require additional durability.

Colors

White

Characteristics

- High durability
- Excellent impact resistance
- Good elongation
- Great chemical resistance

Uses

- Production parts
- Housings and enclosures
- Thin-walled ducting
- Snap-fits and living hinges
- Automotive components



Property	White
Tensile Modulus (ISO 527)	1500 MPa
Ultimate Tensile Strength (ISO 527)	50 MPa
Tensile Elongation at Break (ISO 527)	45 %
Flex Modulus (ISO 178 @ 23°C)	1200 MPa
Charpy Unnotched (ISO 179 1eU @ 23°C)	No Break
Hardness Shore D (ASTM D2240)	77

PA12

PA12 powder is a durable nylon plastic with good detail and surface finish that can be used for a wide range of applications, both for prototyping and for end products. Typical applications of the material are fully functional parts with excellent surface finish right out of the printer, which easily withstand mechanical and thermal loads.

Colors

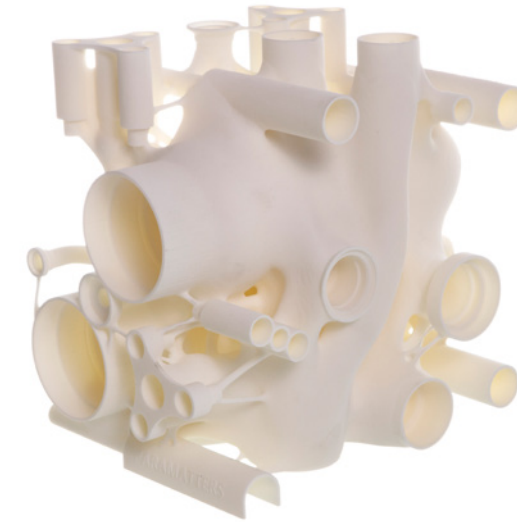
White

Characteristics

- Durable
- Good detail
- Excellent surface finish
- Strong
- Good chemical resistance

Uses

- Fully functional manufactured parts
- Product housings and enclosures
- Thin-walled ducting
- General-purpose prototypes
- Medical applications



Property	White
Tensile Modulus (ASTM D638)	1703 MPa
Ultimate Tensile Strength (ASTM D638)	48 MPa
Tensile Elongation at Break (ASTM D638)	24 %
Flex Modulus (ASTM D790)	1496 MPa
Flex Strength (ASTM D790)	58 MPa
Hardness Shore D (ASTM D2240)	75

Material Tech Specs

				Tensile Modulus (ASTM D638)	Ultimate Tensile Strength (ASTM D638)	Tensile Elongation at Break (ASTM D638)	Flex Modulus (ASTM D790)	Flex Strength (ASTM D790)	HDT @0.45 MPa (ASTM D648)	Notched Izod (ASTM D256)	Water Absorption (ASTM D570)	Hardness (ASTM D2240)	Energy Return	Tear Strength (ASTM D624)	Surface Resistance (ASTM D257)
Property	Sub Group	Material	Color	MPa	MPa	%	MPa	MPa	°C	J/m	%	Shore	%	kN/m	Ω
General Purpose		x45	Natural	1600	52	12	2100	95		20	6.0	D 85			
General Purpose		x45	Clear	1600	52	12	2100	95		19	6.0	D 85			
General Purpose		x45	Black	1600	52	12	2100	95		19	6.0	D 85			
General Purpose		xMODEL15	Black		48	28		49		36					
General Purpose		xMODEL15	Gray		48	28		49		36					
General Purpose		xMODEL15	White		48	28		49		36					
General Purpose		xMODEL17 Clear	Clear		30	22	1467	57	47	47	0.24				
General Purpose		xMODEL35	Black	1213	62	10	2300	108	87	21	0.4	D 83			
General Purpose		xMODEL35	Gray	2600	62	10	2300	108	87	21	0.4	D 83			
General Purpose		xPRO410	Black	2600	41	6			61	25	0.5	D 79			
Engineering	Rigid	xPP405	Black	2365	35	100	1300	45	53	62	1.0	D 80			
Engineering	Rigid	xPP405	Clear	1300	35	100	1300	45	53	62	2.0	D 79			
Engineering	Rigid	xABS3843	Black	1400	32	50	1400	30	56	54	2.3	D 86			
Engineering	Rigid	xCE	Black	2840	69	8	3250	135	87	20	0.4	D 89			
Engineering	Rigid	xCE	White	2840	69	8	3250	135	87	20	0.4	D 89			
Engineering	Rigid	xPEEK147	Black	3190	75	3	3170	130	238	15	0.2	D 94			
Engineering	Rigid	xCERAMIC3280	White	9410	40	0.5			280		0.3	D 96			
Engineering	Rigid	xESD	Black	2600	68	4	1800	97	91	24		D 87	75		10 ⁷
Engineering	Elastomers	xFLEX402	Black	42		230					3.15	A 73	35		
Engineering	Elastomers	xFLEX475	Black	4	3	150						A 44	47	7.3	
Engineering	Elastomers	xFLEX475	White	5	4	159						A 55	39	7.3	
Dental		KeyModel Ultra	Ivory	1700	50	5	1940	70				D 85			
Dental		KeySplint Hard	Clear			9	1600	65							
Dental		KeySplint Soft	Clear			110	1400	47	32			D 85			
Dental		KeyGuide	Translucent				2400	106							
Dental		KeyTray	Lavender	2056	62	26	1913	84				D 86			
Dental		KeyOrtho IBT	Translucent	10.5	31	130									
Dental		xMODEL2505	Beige	2500	54	4%	2100	8300				D 73			
MFG Powder		xPA11	White	1500*	50*	45*	1200 †					D 77			
MFG Powder		XPA12	White	1703*	48*	24*	1496 †	58				D 75			

* ISO 527
† ISO 176
∅ Charpy ISO 179 1eU (23°)

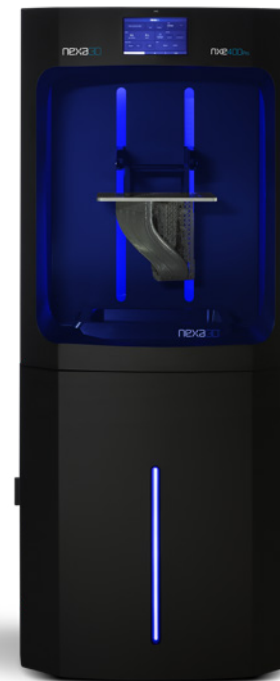
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