Introduction to Lumia X1

The Lumia X1 is a Hi-Speed SLA system that encompasses patented Hybrid PhotoSynthesis (HPS) and TruLayer Technology.

HPS technology uses multiple energy sources to simultaneously image both expansive flat areas and intricate details. Meanwhile, TruLayer Technology facilitates rapid detachment of the active print layer, seamlessly transitioning to the next layer.

With the Lumia X1, traditional tradeoffs among accuracy, surface finish, throughput, and print reliability are now obsolete and accomplished within a single print. Standard waiting periods between layers are eradicated, freeing the process from limitations on the size and bulk of printed cross-sections. Achieving diverse geometries is now possible with 2X-8X higher throughput compared to current technologies.

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INDUSTRIAL RESIN

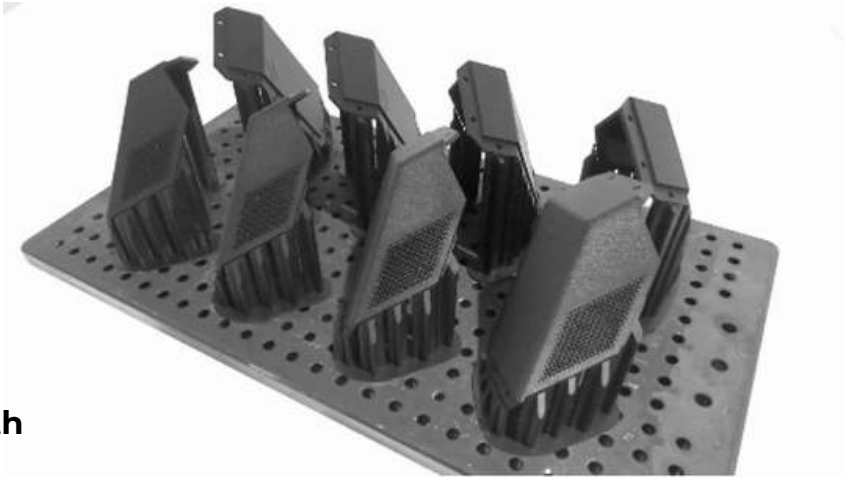
Henkel

Loctite® 3D IND3380™

TThis material is a high-temperature resistant resin with electrostatic dissipating (ESD) capabilities and high stiffness. It has a smooth surface finish, impressive chemical resistance, and a high HDT of 190°C. It's a reliable option for tooling applications, jigs, and fixtures.

Features
- High accuracy and fine detail printing
- Displays electrostatic dissipative properties (ESD)
- Excellent stiffness and versatility

Applications
- Jigs & fixtures
- Electronic manufacturing
- Tooling at high temperature and low pressure



Ultimate Tensile Strength
50 MPa

Tensile Modulus
3000 MPa

Elongation at Break
1-2 %

Notched Izod Impact Strength
12.5 J/m

Shore Hardness
86.5 D

HDT, 1.82 MPa
110°C

HDT, 0.455 MPa
190°C

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AXTRA3D

INDUSTRIAL RESIN

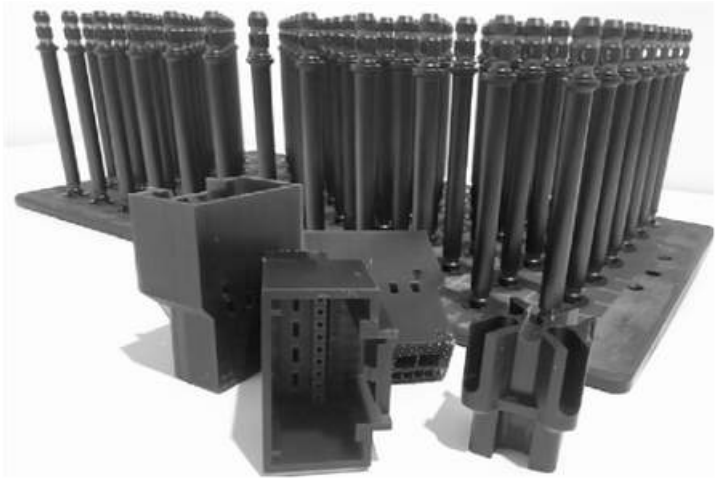
Henkel

Loctite® 3D IND 249™

This material is a high-temperature, high strength material that prints challenging geometries with fine feature resolution. This low-viscosity material features exceptionally high green strength to enable ease of processing. Stiffness and thermal durability ideal for production applications such as mold tooling, manufacturing aids and other complex geometries.

Features
- High stiffness and thermal durability
- Low viscosity
- High accuracy

Applications
- Electronic manufacturing
- Mold tooling
- Manufacturing aids



Ultimate Tensile Strength
98 MPa

Tensile Modulus
3300 MPa

Elongation at Break
5 %

Notched Izod Impact Strength
24 J/m

Shore Hardness
88 D

HDT, 0.455 MPa
115°C

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AXTRA3D

INDUSTRIAL RESIN

Arkema

N3xtDimension® N3D-FR512™

This material is a flame retardant material that achieves a UL-94 rating of V-0 at 0.8mm while maintaining good print accuracy with fine feature parts. It is characterized by excellent green strength allowing for robust printing and easy cleanup and processing.

Features
- High strength and HDT
- Liquid at room temperature
- Robust printing and processing

Applications
- Flame retardant materials
- Electrical connectors

Ultimate Tensile Strength
42 MPa

Tensile Modulus
5100 MPa

Elongation at Break
4.2 %

HDT, 0.455 MPa
170°C

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MEDICAL INDUSTRY

Loctite®

Loctite® 3D MED414

This material is a medical grade soft photopolymer resin with excellent elongations and tear strength properties. Good tear resistance and strength make this material ideal for use in a wide variety of elastomeric medical device and skin contact applications. Comes in blue.

Features
- Torsional flexibility
- True elastomeric behavior
- Good balance of strength and elongation

Applications
- Medical Devices
- PPE

Tear Strength
16 kN/m

Stress at Break
4 MPa

Hardness
51

Elongation at Break
240 %

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INDUSTRIAL RESIN

Loctite®

Loctite® 3D IND475

Single component industrial strength UV resin that cures to a soft, elastomeric material. IND475 is suitable for applications where resilience, snap back, and tear resistance is desired, such as lattice structures and functional prototyping. Easy to print of a variety of platforms, making it a superior material for elastomeric applications. The material is available in black.

Features
- High Resilience/High energy return
- True elastomeric behavior
- Fast printing with low shrinkage behavior

Applications
- Air and dust gaskets
- Flexible seals and housings
- Cushioning pads

Energy Return
77 ± 4 %

Elongation at Break
140 %

Hardness
48 A

Tensile Stress at Break
3.2 MPa

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AXTRA3D

INDUSTRIAL RESIN

Henkel

Loctite® 3D 3843™

This material is a slow curing engineering tough resin with high strength, good impact resistance and excellent surface finish. It's the best choice for a wide variety of tooling applications in automotive, industrial and consumer markets. Examples are jigs and fixtures, housings and covers. It meets biocompatibility standards for irritation and cytotoxicity.

Features
- High impact strength
- Semi-flexible
- Good impact resistance
- Excellent and matte surface finish
- Biocompatible capable per ISO10993-23 and ISO10993-5

Applications
- Manufacturing aids
- Jigs & fixtures
- Housings
- Covers and insoles

Solid Part Density
1.2 g/cc

Tensile Strength at Break
51 MPa

Tensile Modulus
1800 MPa

Elongation at Break
43 %

Notched Izod Impact Strength
53 J/m

Shore Hardness
75 D

HDT, 0.455 MPa
63°C

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INDUSTRIAL RESIN

3D Systems

Figure 4® PRO-BLK 10

Offers tool-less, same-day production for various applications. Fast print speed and exceptional throughput. High precision resin producing parts with a smooth surface finish and sidewall quality. It has excellent mechanical properties and long-term environmental stability.

Features

– Improved environmental stability of mechanical and performance properties over time
– Fast throughput for part-in-hand with no secondary thermal cure required
– Accurate, low distortion material for fast first article print success

Applications

– Motor housings
– Connectors
– Snap-fits
– Automotive interior components

Ultimate Tensile Strength
63 MPa

Solid Part Density
1.16 g/cc

Tensile Modulus
2320 MPa

Elongation at Break
12 %

Unnotched Izod Impact Strength
614 J/m

Shore Hardness
79 D

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INDUSTRIAL RESIN

Forward AM

Ultracur3D® RG 3280

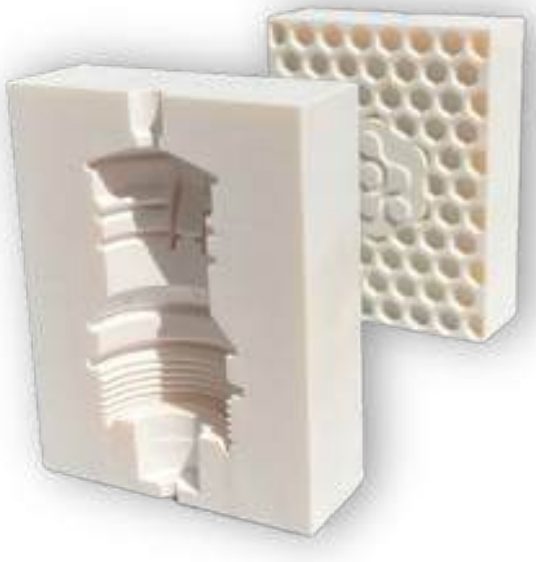
This material is a ceramic-filled composite material offering an extremely high stiffness around 10 GPa and an HDT above 280°C. This material finds applications in tooling, molding, and wind tunnel testing. Despite the high particle loading, the viscosity is kept low and the settling of particles is limited, making this resin very easy to handle and print. It meets biocompatibility standards for cytotoxicity.

Features

- Superior stiffness and temperature performance
- Fast and easy to print
- High suspension stability
- Ceramic-like color and feel
- Biocompatible capable per ISO10993-5

Applications

- Tooling
- Molding
- Wind tunnel testing



Solid Part Density
1.73 g/cc

Ultimate Tensile Strength
87 MPa

Elongation at Break
1.3 %

Shore Hardness
96 D

Tensile Modulus
10600 MPa

HDT, 1.82 MPa
132°C

HDT, 0.455 MPa
284°C

Flammability
UL94 HB

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INDUSTRIAL RESIN

Forward AM

Ultracur3D® ST 45

This material is a reactive urethane photopolymer for tough applications that delivers an excellent combination of high strength, long term toughness and impact resistance. It is well suited for 3D printing high performance functional parts requiring high accuracy and mechanical strength. It ensures fast printing with impressive surface finish. Available in clear and black.

Features
- High strength, toughness and impact resistance
- Very fast printing and great surface finish
- Available in clear and black

Applications
- Electrical connectors
- Housings
- Prototyping
- Highly detailed and textured parts

Solid Part Density
1.23 g/cc

Elongation at Break
21 %

Tensile Modulus
2000 MPa

HDT, 0.455 MPa
63°C

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AXTRA3D

INDUSTRIAL RESIN

Forward AM

Ultracur3D® RG 1100

This material is a high-strength polyurethane-based engineering grade resin with mechanical properties comparable to widely spread injection molding grades used in automotive or other demanding industries.

Features
- Very high stiffness
- Impressive all-round temperature resistance
- Very high chemical resistance and low water uptake

Applications
- Low pressure molding
- Demanding engineering parts
- Exterior covers
- Brackets and housings

Ultimate Tensile Strength
70 MPa

Solid Part Density
1.2 g/cc

Elongation at Break
5 %

Tensile Modulus
3080 MPa

HDT, 0.455 MPa
100°C

HDT, 1.82 MPa
78°C

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INDUSTRIAL RESIN

ForwardAM

Ultracur3D® EL 4000

This material is a flexible and elastomeric resin. Due to its superior strength, rebound, and tear resistance, this material is perfectly suitable for applications such as footwear, bike saddles, and cushioning pads. The material is available in black.

Features
- High hardness (Shore 90 A)
- High green strength, ideal for printing intricate flexible parts
- Superior strength, rebound and tear resistance

Applications
- Footwear
- Bike saddles
- Cushioning pads

Elongation at break
160 %

Hardness
90 A

Rebound resilience
26 %

Tear Strength (Graves)
49 N/mm

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INDUSTRIAL RESIN

Spectroplast

TrueSil-X50

This material is a biocompatible 100% pure silicone material offering exceptional performance and versatility for both industrial and healthcare applications. It combines low viscosity, durable mechanical properties and high resolution.

Features
- Biocompatible
- Durable and flexible
- Precise and customizable

Applications
- Sealants, gaskets, buttons
- Adapters, holders, connectors
- Anatomical models
- Audiology
- Dental mouthguards
- Cosmetics
- Baby care

Elongation at Break
350 %

Shore Hardness
55 A

In Development.

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AXTRA3D

INDUSTRIAL RESIN

3D Systems

Figure 4® Hi-Temp 300-AMB

This material is an ultra-high temperature plastic for use in applications requiring high heat resistance. With an HDT of over 300°C at both low and high stress (HDT at 0.455 and 1.82 MPa), this material is well suited for the testing of high temperature components. It does not require a secondary thermal post-cure.

Features
- High-temperature resistant
- Translucent
- Impressive visualization properties
- No secondary thermal post-cure
- Long term environmental UV and humidity stability

Applications
- High temperature component testing
- General use parts
- Low pressure molding/tooling: expanding foams, rubbers, etc.
- Overmolding

Solid Part Density
1.3 g/cc

Ultimate Tensile Strength
77 MPa

Elongation at Break
2.5 %

Shore Hardness
89 D

Tensile Modulus
4100 MPa

HDT, 0.455 MPa
> 300°C

HDT, 1.82 MPa
> 300°C

Flammability
UL94 HB

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AXTRA3D

INDUSTRIAL RESIN

3D Systems

Figure 4® Tough Clear

This material delivers a versatile combination of mechanical stability and properties suitable for functional prototyping or end-use parts. It offers high light transmission that can be made fully transparent with post-processing.

Features

– Excellent clarity that can be further improved with post-processing steps like clear coating
– Long-term environmental stability of mechanical properties and performance
– Ability to go from prototype to production parts using clear or transparent aesthetics
– Supports functional testing in outdoor settings
– Automotive fluid and chemical compatibility

Applications

– Lighting covers, cases, light guides
– Structural brackets, snap-fits, fasteners
– End-use manufacturing of high volume, small plastic parts
Consumer goods, consumer packaging

Solid Part Density
1.2 g/cc

Tensile Modulus
2300 MPa

Elongation at Break
12 %

Unnotched Izod Impact Strength
460 J/m

Shore Hardness
81 D

Flammability
UL94 HB

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AXTRA3D

INDUSTRIAL RESIN

3D Systems

Figure 4® MED-WHT 10

Rigid, white material for a range of medical and industrial applications, including when biocompatibility, sterilization and/or thermal resistance is required. Capable of meeting ISO 10993-5 and -10 standards for biocompatibility (cytotoxicity, sensitization, and irritation), this material can also be sterilized by autoclave. Delivers highly accurate parts with excellent feature resolution and high definition.

Features
- Sterilizable by autoclave
- High temperature testing
- True-to-CAD accuracy and crisp feature detail
- Smooth surfaces for beautiful display models

Applications
- General medical applications requiring biocompatibility, sterilization and/or thermal resistance
- Splints, surgical drill guides, bone models
- Parts requiring rigidity with high temperature and/or water resistance
- Parts with high-definition details

Solid Part Density
1.27 g/cc

Ultimate Tensile Strength
60 MPa

Tensile Modulus
3090 MPa

Elongation at Break
3 %

Unnotched Izod Impact Strength
91 J/m

Shore Hardness
91 D

HDT, 0.455 MPa
102°C

HDT, 1.82 MPa
79°C

Flammability
UL94 HB

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DENTAL RESIN

Keystone

KeyModel Ultra™

Engineered with ultra-fast technology, this material enables lightning-speed printing without compromising accuracy. It's easy thermoforming release, coupled with a quick-release agent, simplifies the post-processing stage, allowing for efficient and seamless model extraction. Designed for 3D printing of next-gen dental and orthodontic models. Available in Light Gray and Ivory.

Features

– Ultra-fast printing
– Integrated thermoforming quick-release agent
– Flawless detail
– Carve-able without chipping
Impressive surface detail

Applications

– Rapid production of dental and orthodontic models

Ultimate Tensile Strength
> 50 MPa

Tensile Modulus
1700 MPa

Elongation at Break
5 %

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DENTAL RESIN

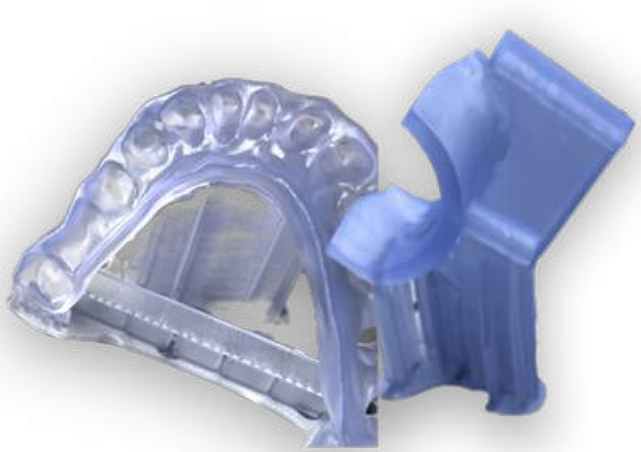
Keystone
KeyGuide®

KeyGuide is a clear, stiff, durable, and biocompatible (class I) light curing resin designed for 3D printing highly accurate surgical guides. It's indicated for intra-oral use in guided dental implant surgery and for placing implants at a precise angle and depth by a dental professional. This material can withstand the forces of guided surgery in the oral cavity.

Features
- Biocompatible capable per ISO10993-5 and ISO10993-10
- Autoclave sterilizable
- High strength and stiffness for withstanding typical forces during use

Exceptional accuracy ensuring consistent fit of the guide and sleeves

Applications
- Surgical guides



Ultimate Flexural Strength
106 MPa

Flexural Modulus
2400 MPa

Elongation at Break
6.3 %

Shore Hardness
95 D

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DENTAL RESIN

Keystone

KeySplint Hard® Clear

This material is indicated for the fabrication of orthodontic and dental appliances such as bite planes, mouthguards, nightguards, snoring appliances, splints and repositioners. It provides unmatched detail and precision, while being stain and abrasion resistant.

Features

– Biocompatible capable per ISO10993-1
– United States FDA 510k-Cleared
– CE Marked (Class IIA)
– Unmatched Strength
– Stain resistant
– Highly abrasion-resistant

Easy to polish

Applications

– Mouthguards, nightguards
– Splints, reposiitioners
– Retainers (not flexible)

Ultimate Flexural Strength
100 MPa

Flexural Modulus
2300 MPa

Elongation at Break
9 %

Shore Hardness
89 D

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AXTRA3D

DENTAL RESIN

Keystone

KeySplint Soft® Clear

This material has the effectiveness of a hard splint while obtaining the comfort of a soft splint. This material contains high detail and precision. Supports are easy to release without too much after treatment, and the models are easy to finish for a beautiful end result.

Features

– Biocompatible capable per ISO10993-5 and ISO10993-10
– Enhanced patient comfort
– Not brittle
– Fracture and abrasion resistant
– Flexible
– Transparent

Applications

– Orthodontic and dental appliances
– Bite planes, mouthguards, nightguards, splints and repositioners

Ultimate Flexural Strength
45 MPa

Flexural Modulus
1200 MPa

Ultimate Flexural Strength
52 MPa

Tensile Modulus
1790 MPa

Elongation at Break
> 110 %

Shore Hardness
80-85 D

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DENTAL RESIN

NextDent

Base

This material is intended for the manufacturing of removable denture bases, normally intended for permanent use. It offers accurate and repeatable printing results. It is a class IIa material and CE-certified.

Features

– Biocompatible capable per ISO10993-1
– High break resistance
– Flexibility for partial dentures
– Accurate and repeatable printability

Applications

– Full removable dentures
– Partial removable dentures

Fracture Work
≥ 2000 J/m²

Stress Intensity Factor
≥ 1.5 N/mm

Charpy Impact
≥ 8.0 kJ/m²

Water Sorption
≤ 32 µg/mm³

Water Solubility
≤ 8 µg/mm³

Viscosity
300-400 cps

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DENTAL RESIN

Pro3dure

Printodent® GR-19.1 OA | MSI

This material is the first biomimetic 3D printing resin for the generative production of hard-elastic orthodontic splints. Splints made of this material exhibit reduced biofilm adhesion. The effect is based on natural substances that sustainably inhibit the communication of bacteria.

Features

– Reduced biofilm adhesion due to MSI technology
– Hard flexible
– Highest wearing comfort due to thermo effect

Applications

– Hard-elastic orthodontic splints with reduced biofilm adhesion

Ultimate Flexural Strength
56 MPa

Flexural Modulus
1550 MPa

Water Sorption
< = 32 ug/mm3

Water Solubility
< = 5 ug/mm3

Water Solubility
< = 250 MPa/m2

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