keyprint™

by keystone industries

PRECISION 3D RESINS

/print™
one Industries
Model™

We Are Keystone

- Dental manufacturer of innovative operatory, laboratory and preventive dental products since 1908
- Maintains FDA licensing, ISO 9001 and 13485 (medical device) certifications, and international product registrations
- 800+ distribution partners in 70+ countries
- Manufacturing: 400,000 sf in 3 sites in PA and NJ
  - 25 years ago, Keystone started making light-cured products for the dental and cosmetic nail industries
  - Today, we make millions of pounds of biocompatible photopolymer materials each year
- R&D focus - more than 45 granted and pending patents and 34 degreed scientists.
- Keystone is both a branded and private label supplier

100

YEARS IN DENTAL

+

25

YEARS AS A MANUFACTURER OF PHOTOPOLYMERS

=

keyprint™

Our Journey

In an industry that is increasingly defined by the ability to innovate, adapt, and produce consistent results, Keystone Industries is proud to introduce KeyPrint™ — a new line of precision 3D resins specifically formulated for the dental industry.

Keystone has combined its unique blend of dental and photopolymer expertise to deliver the highest quality 3D printing resins to the dental market. Not only has Keystone been manufacturing premium dental products since 1908, but it has decades of experience as a leading producer of biocompatible, cutting-edge, patented photopolymer resins.

Entirely designed and produced in the USA, the full KeyPrint™ line of materials will be available throughout North America and Europe. These high-quality resins are designed for use in DLP printers using wavelengths from 365 - 405 nm and yield accurate, stable and strong printed parts.

> "These are certainly the best materials I have ever seen. The color, clarity and detail of the printed parts are superior."
>
> DELL DINE, COO OF 3D DDS

Keystone is profiling 3D printers on an on-going basis to ensure our KeyPrint™ resins work reliably in multiple open source printers. Keystone will work with your company's specific printer needs to optimize the printer settings to work with KeyPrint™ resins.

Keystone also offers private label opportunities for its dental 3D printing materials. We can partner with companies looking to develop and launch 3D resins specifically tailored to your additive manufacturing system.

Future of 3D Dental: Growth

60
PERCENT

60% of dental production is expected to be filled by 3D printing by 2025*

16.5
PERCENT

The Global 3D Dental Market is expected to grow by 16.5% CAGR by 2025**

41.9
PERCENT

North America is the fastest growing 3D dental market, expected to be 41.9% of the global 3D market by 2025**

*SmarTech: 3D Printing in Dentistry 2015: A Ten-year Opportunity Forecast and Analysis, May 2015
**Transparency Market Research Report, June 2017

KEYPRINT™: PRECISION 3D RESINS

KeyModel™

- Material produces highly-precise models with smooth, hard surfaces for optimal scanning
- Colored for easy visibility of margins and tooth anatomy
- Keystone's low-shrinkage formulation yields exacting models for crown, bridge or implant work
- Perfect for forming thermalplastics such as splints, sports guards and bleaching trays
- Pairs perfectly with KeyMask™

#4220006 KeyModel™, 35.3 oz (1 kg)

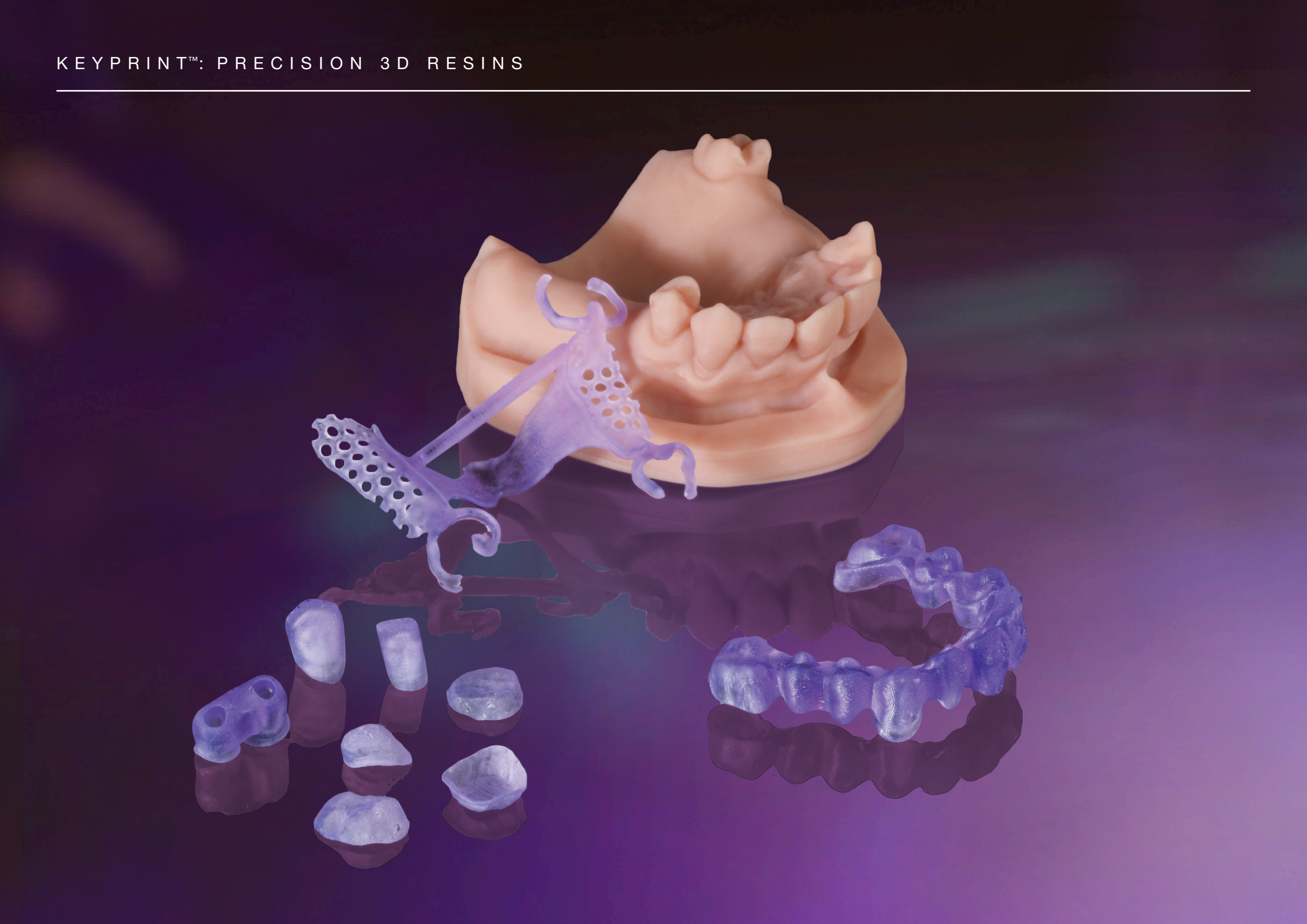
PROPERTY	PROCEDURE	TESTING	KEYMODEL™
Tensile Strength (MPa)	ASTM D638-03	Pull Force	51.5
Elongation at break %	ASTM D638-05	Pull Force	5.60%
Young's Modulus (MPa)	ASTM D638-04	Pull Force	1853
Flexural Strength (MPa)	ASTM D790	Flex Force	79.6
Flexural Modulus (MPa)	ASTM D790	Flex Force	2293
Flexural Strain % (Max 10%)	ASTM D790	Flex Force	7%
Tg (°C)	DSC	Thermal Analysis	50-60°C
Shore Hardness (D)	Scale D	Physical Analysis	86D
IZOD Impact (J/m)	ASTM D256	Physical Analysis	42.3

KeyOrthoModel™

- Designed for high-speed prints (150 µm+ z-axis layers) that are highly accurate, hard and strong
- Fast and accurate – can build at least 780 µm per minute printing @ 200 µm z-axis layers
- Perfect for thermoforming orthodontic devices
- Maintains stability when subjected to thermoforming temperatures

#4220003 KeyOrthoModel™, 35.3 oz (1 kg)

PROPERTY	PROCEDURE	TESTING	KEYORTHOMODEL™
Tensile Strength (MPa)	ASTM D638-03	Pull Force	51.5
Elongation at break %	ASTM D638-05	Pull Force	5.60%
Young's Modulus (MPa)	ASTM D638-04	Pull Force	1853
Flexural Strength (MPa)	ASTM D790	Flex Force	79.6
Flexural Modulus (MPa)	ASTM D790	Flex Force	2293
Flexural Strain % (Max 10%)	ASTM D790	Flex Force	7%
Tg (˚C)	DSC	Thermal Analysis	50-60˚C
Shore Hardness (D)	Scale D	Physical Analysis	86D
IZOD Impact (J/m)	ASTM D256	Physical Analysis	42.3

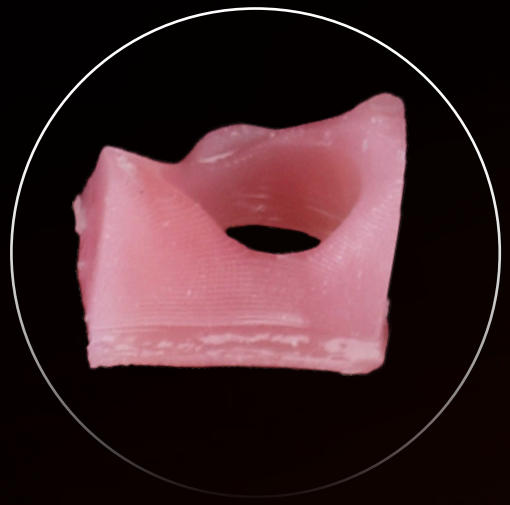


KeyCast™

- For casting of crowns, copings and partial dentures, this material produces a strong, porous-free 3D print that is resistant to fractures in even the finest of details
- It burns out easily using existing ovens and workflows, with no residual ash, yielding detailed frames and accurate crowns

#4220000 KeyCast™, 35.3 oz (1 kg)

PROPERTY	PROCEDURE	TESTING	KEYCAST™
Tensile Strength (MPa)	ASTM D638-03	Pull Force	16
Elongation at break %	ASTM D638-05	Pull Force	15.60%
Young's Modulus (MPa)	ASTM D638-04	Pull Force	25
Shore Hardness (D)	Scale D	Physical Analysis	40
Shrinkage	ASTM D792	Dimensional Stability	<2%
CTE 0-150˚C (32-302˚F)	ASTM E831	Thermal Analysis	168 x 10-6m/(m·˚C)
CTE 150-250˚C (302-482˚F)	ASTM E831	Thermal Analysis	64 x 10-6m/(m·˚C)
CTE >250˚C (>482˚F)	ASTM E831	Thermal Analysis	<0m/(m·˚C)



KeyMask™

- A flexible pink material that produces gingival masks to simulate the look and feel of gum tissue in restoration planning
- Pairs perfectly with KeyModel™

#4220002 KeyMask™, 17.6 oz (0.5 kg)

Bio
Biocompatible Resins
PRECISION 3D RESINS

KEYPRINT™: PRECISION 3D RESINS

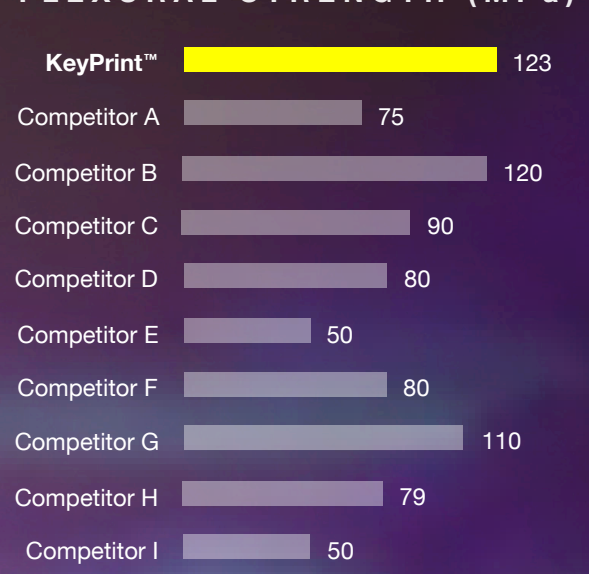
Bio

KeyGuide™

- Biocompatible material for precise and transparent surgical guides
- The print is strong and high-precision for optimal placement and drilling during surgery

#4220001 KeyGuide™, 35.3 oz (1 kg)

AS STRONG AS THEY COME



Available now for sampling!
Purchase availability coming soon.

Bio

KeySplint Hard™

- Biocompatible material for rigid splint devices
- The print is strong and transparent for cases where tooth immobilization is the priority

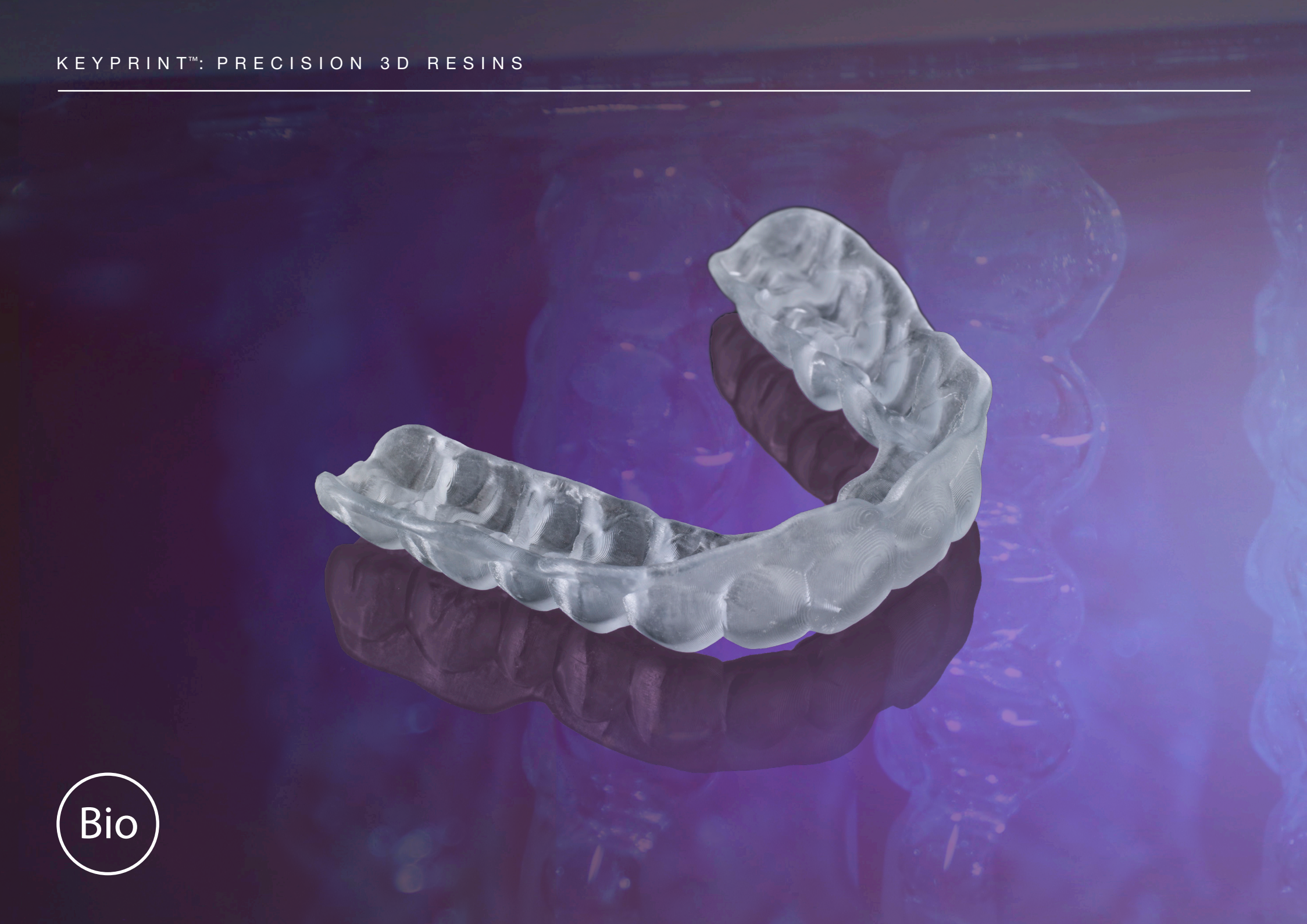
#4220004 KeySplint Hard™, 35.3 oz (1 kg)

AS STRONG AS THEY COME

FLEXURAL STRENGTH (MPa)

FLEXURAL MODULUS (MPa)

Available now for sampling!
Purchase availability coming soon.



Bio

KeySplint Soft™

- Biocompatible material for flexible splint devices
- Unique formulation balances flexibility and strength in the material
- The print is transparent and polishable, with some flexibility and give
- Perfect for night guards and retainers

#4220005 KeySplint Soft™, 35.3 oz (1 kg)

PROPERTY	PROCEDURE	TESTING	KEYSPLINT SOFT™
Tensile Strength (MPa)	ASTM D638-03	Pull Force	43.7
Elongation at break %	ASTM D638-05	Pull Force	60%
Young's Modulus (MPa)	ASTM D638-04	Pull Force	1063
Flexural Strength (MPa)	ASTM D790	Flex Force	39.6
Flexural Modulus (MPa)	ASTM D790	Flex Force	863
Flexural Strain % (Max 10%)	ASTM D790	Flex Force	10+%
Tg (°C)	DSC	Thermal Analysis	78°C
Shore Hardness (D)	Scale D	Physical Analysis	82D
IZOD Impact (J/m)	ASTM D256	Physical Analysis	83.9

Available now for sampling!
Purchase availability coming soon.

keystone®
industries

480 South Democrat Road Gibbstown, NJ 08027 USA | 1.800.333.3131
Werner-von-Siemens Str. 14a D-78224 Singen, Gerrmany | +49 77 31 91 21 01
keystoneindustries.com

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