



Ultracur3D[®] Photopolymers

Product Portfolio

BASF 3D Printing Solutions (B3DPS)

Status June 2024

Ultracur3D® - Product Lines

Ultracur3D®
Product
Portfolio



Flexible



Tough



Rigid



Dental



Supplementary

Technology
Specific



Daylight



SLA

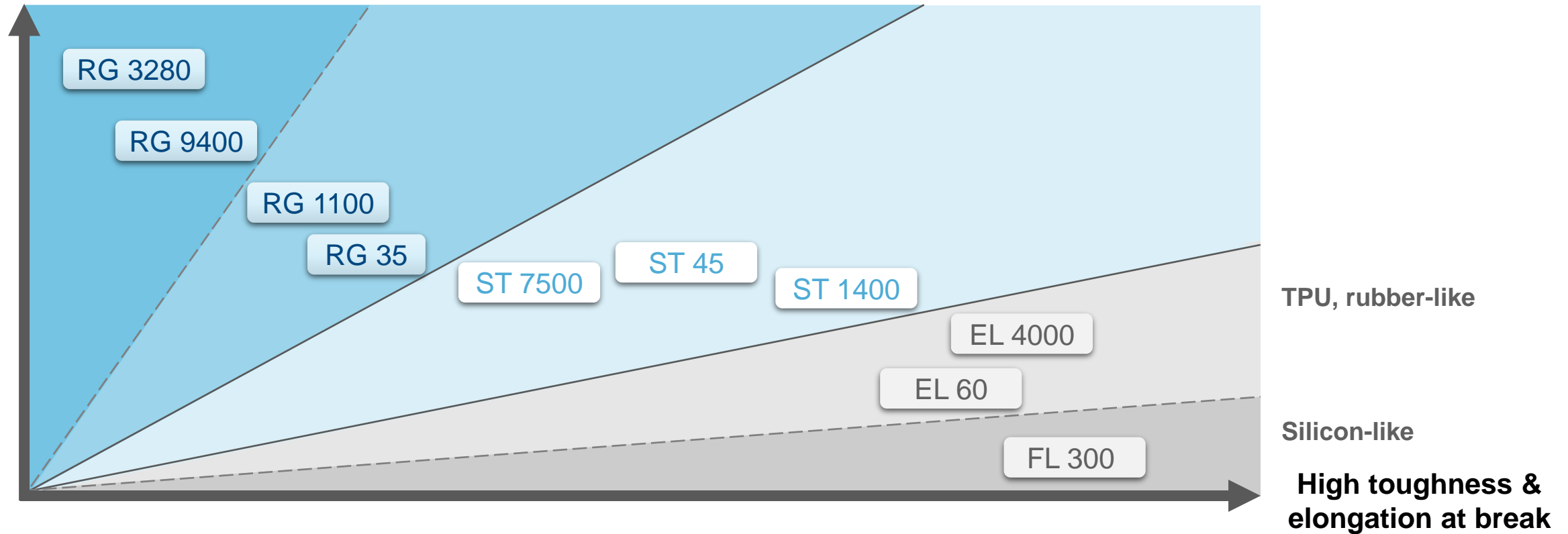
Ultracur3D® - Overview Engineering Grades

High stiffness
& HDT

PEEK, PA6-like

PBT, PC-like

ABS, PP-like



Ultracur3D® Portfolio

Products at a Glance

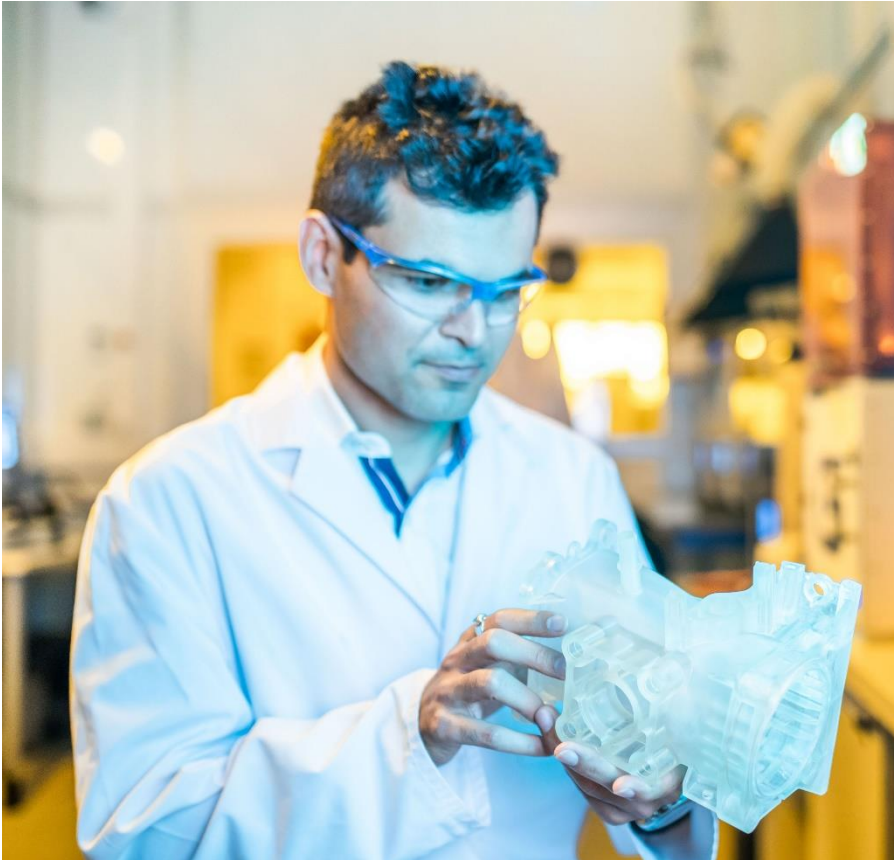
Ultracur3D® Photopolymers Product Lines

- Class-leading performance and reliability to enable serial production of end-use parts
- Offering cost-effective and scalable solutions through high printing speed and ease of processing
- Broad portfolio spanning different technologies and material classes to cover a wide range of applications



Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® RG

Rigid, high-performance resins

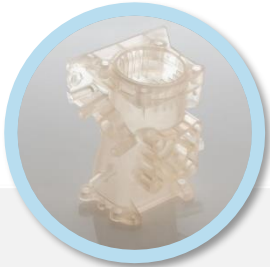
- Top-notch materials for high-performance applications
- Excellent strength, stiffness and temperature resistance



Ultracur3D® RG

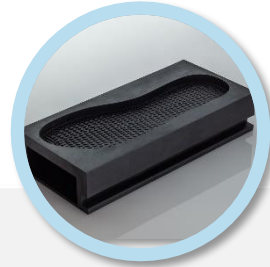
Rigid, High-Performance Resins

- Top-notch materials for high-performance applications
- Excellent strength, stiffness and temperature resistance



Ultracur3D® RG 35 (B)

Rigid | HDT 80 | Clear
Rigid | HDT 80 | Black



Ultracur3D® RG 1100 (B)

Rigid | HDT 100 | Clear
Rigid | HDT 100 | Black



Ultracur3D® RG 9400 B FR

Rigid | Flame-Retardant | Black

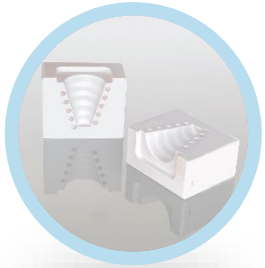


Ultracur3D® RG 3280

Rigid | HDT 280 | Ceramic-Filled

Material Spotlight - Ultracur3D[®] RG 3280

Rigid | HDT 280 | Ceramic-filled



Ceramic-filled resin with exceptionally high stiffness and temperature resistance

- Superior stiffness (E = 10 GPa)
- Superior temperature performance (HDT B >280°C)
- Very fast and easy to print, very stable ceramic suspension
- Exceptional chemical resistance
- Smooth finish
- TPO-free

Color

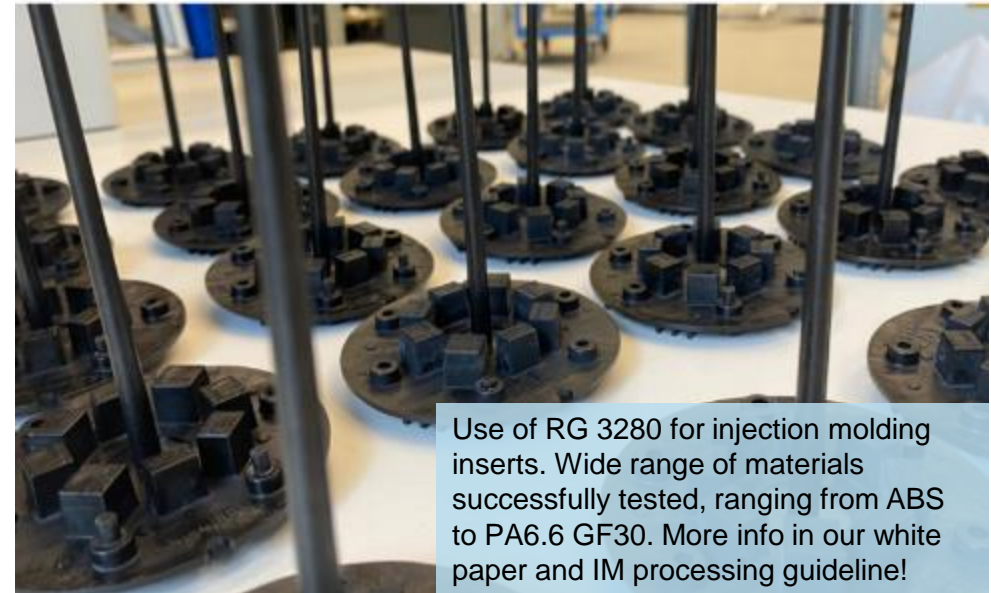
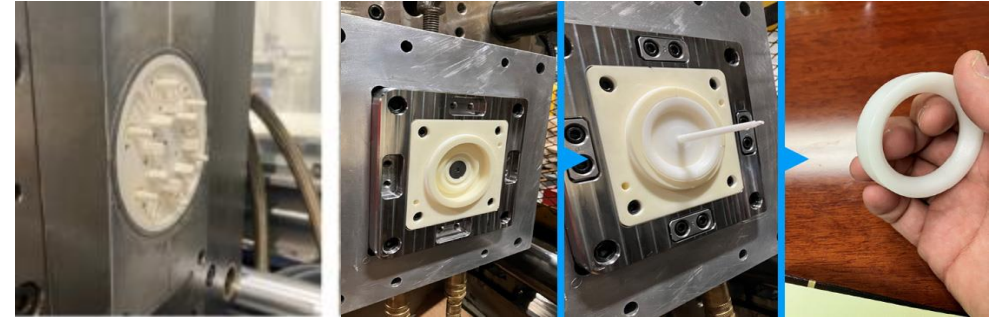
White, ceramic-like



[White paper
IM processing guide](#)

Applications

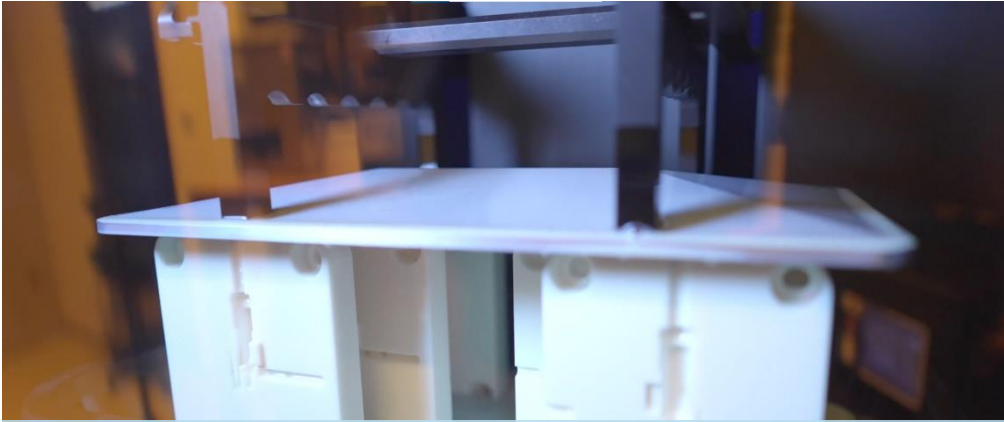
Tooling & molding, wind tunnel testing, decorative / luxury items, electrical applications like insulators



Use of RG 3280 for injection molding inserts. Wide range of materials successfully tested, ranging from ABS to PA6.6 GF30. More info in our white paper and IM processing guideline!

Material Spotlight - Ultracur3D® RG 3280

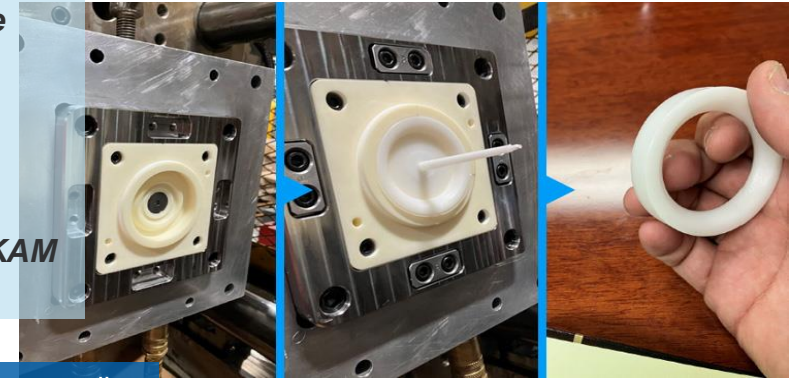
Advancing Rapid Tooling with 3D Printed Injection Molding Inserts



3D Printed Injection Molding Inserts
with Ultracur3D® RG 3280

“Components produced with the inserts matched the performance of those made with traditional tooling, delivering production-like components without the associated costs.”

— Tony Matthews, Global KAM
at Cellasto®



Use case

Expert talk



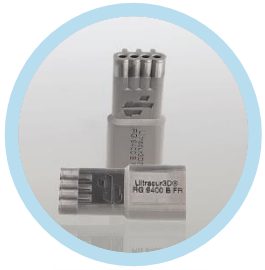
“The technology achieved the requirements for early prototype production and enabled us to check our product geometry and discover potential failures before we invested in an expensive mold. This meant we could eliminate production defects in the steel mold, therefore reducing the number of correction/optimization cycles.”

— Markus Kaaserer, Expert Techno Polymers, MD ELEKTRONIK



Material Spotlight - Ultracur3D® RG 9400 B FR

Rigid | Flame-retardant | Black



Flame-retardant resin with UL 94 V-0 rating and superior HDT

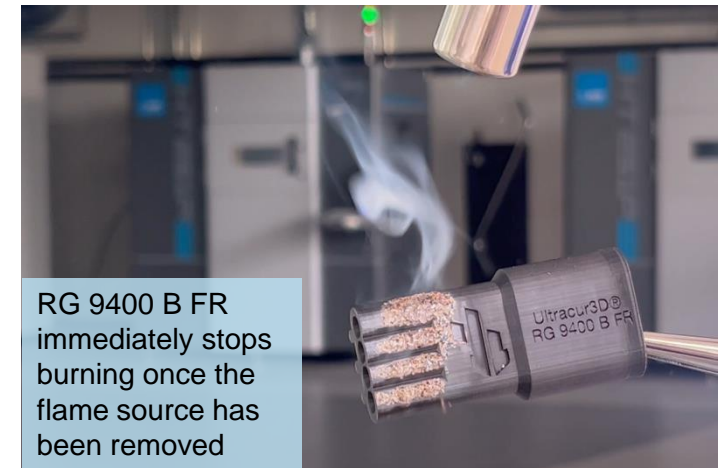
- Flame-retardant (UL 94 V-0 at 2mm)
- Very high temperature resistance (HDT B >250°C)
- Low viscosity, easy to print and process, no heated printer required
- Good fire, smoke, toxicity (FST) performance. Compliant to HL1 (R22) and HL2 (R23, R24) railway classifications.
- Very high chemical and UV weathering resistance
- Halogen free & TPO-free

Color

Black

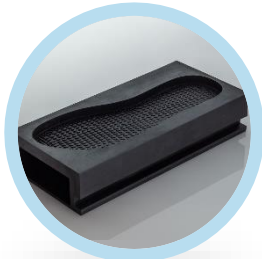
Applications

Applications requiring UL 94 V-0 rating in E&E, automotive, railway & aerospace industries, like electrical connectors, cable holders and housings



Material Spotlight - Ultracur3D[®] RG 1100 (B) – RG 1200 B*

Rigid | HDT 100 | Clear/Black



High-performance rigid resin with superior stiffness and temperature performance

- High stiffness for structural integrity
- Impressive all-round temperature resistance
- Excellent chemical resistance and low water uptake
- Low viscosity and high printing speed, enabling low cost per part

Color

Clear & black

Applications

Manufacturing aids (tools & molds), demanding end-use components in E&E and automotive, like exterior covers, brackets, clips & housings

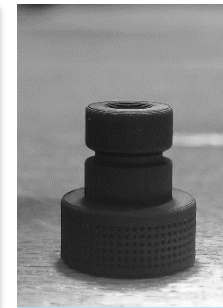
Polyurethane molds with Nexa3D & BASF Polyurethanes



Cable mounts



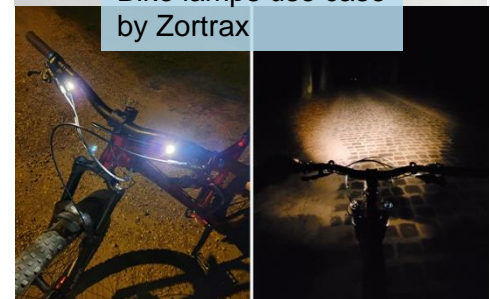
Electric connectors (GENERA, 3D-Werk)



Industrial filters (GENERA, 3D-Werk)



Bike lamps use case by Zortrax



* TPO-free version, currently in beta phase

Material Spotlight - Ultracur3D® RG 1100 B

Polyurethane Molds with Ultracur3D® RG 1100 B / xPRO1100-Black



Polyurethane Molds
with Ultracur3D® RG 1100 B / xPRO1100-Black

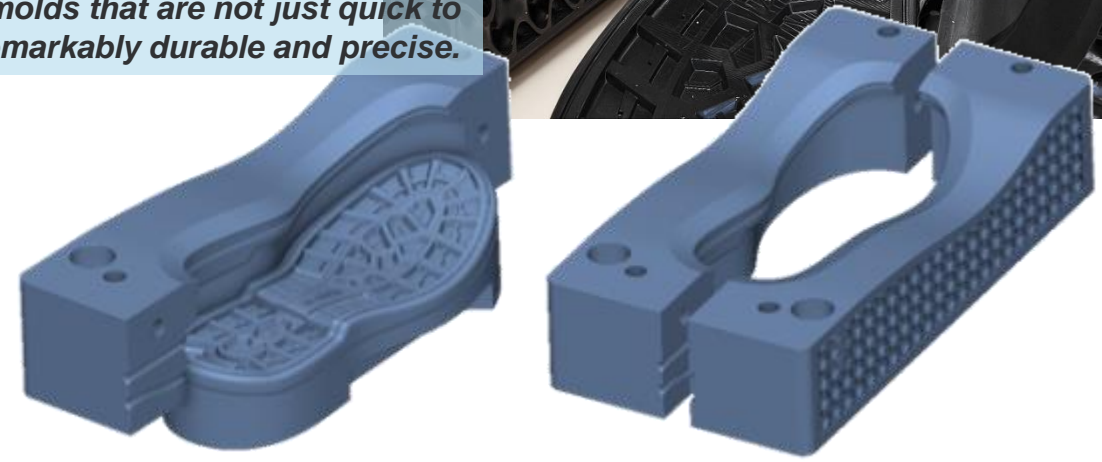


[PU molding guide](#)



3D Printed Polyurethane Molds
Processing Guideline

Through a collaborative effort between BASF Forward AM, BASF Polyurethanes GmbH in Lemförde and Nexa3D, the Ultracur3D® RG 1100 B (rebranded as xPRO1100-Black by Nexa3D) material comes as a definitive solution, enabling the creation of PU molds that are not just quick to produce but also remarkably durable and precise.



Material Spotlight - Ultracur3D[®] RG 35 (B)

Rigid | HDT 80 | Clear/Black



Rigid resin with optimum balance of strength, stiffness and temperature resistance

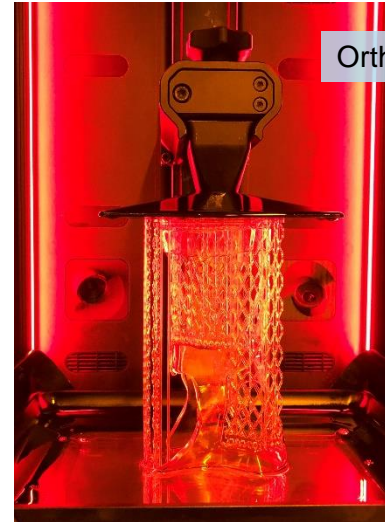
- Good balance of stiffness, toughness and temperature resistance
- Low water uptake
- Very good biocompatibility (passes ISO 10993-5,-10,-11)
- Sterilizable (steam, E-beam, EtO)
- Easy to polish and finish

Color

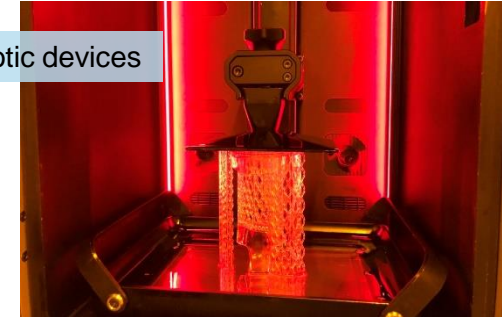
Clear & black

Applications

Jigs & fixtures, molds & inserts, orthotic devices and braces



Orthotic devices



Shoe last



Various post-processing techniques: pearl varnish, enamel, polishing

Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® RG

Rigid, high-performance resins

- Top-notch materials for high-performance applications
- Excellent strength, stiffness and temperature resistance



Ultracur3D® Portfolio

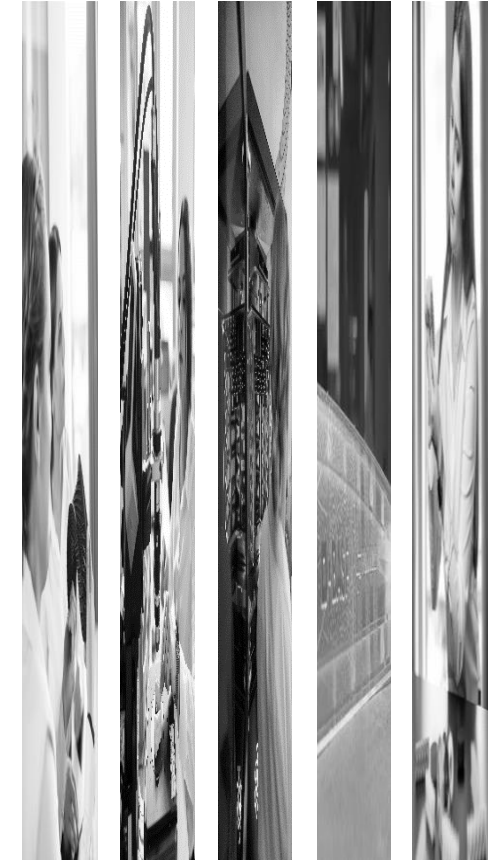
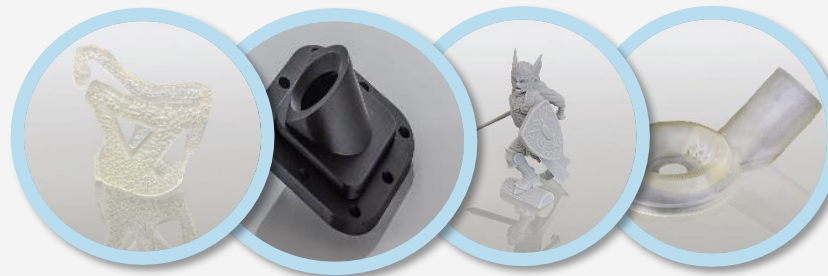
Products at a Glance



Ultracur3D® ST

Tough, multi-purpose resins

- Multi-purpose materials for a wide range of applications
- Superior toughness and impact resistance



Ultracur3D® ST

Tough, Multi-Purpose Resins

- Multi-purpose materials for a wide range of applications
- Superior toughness and impact resistance



Ultracur3D® ST 1400

Tough | High Impact | Clear



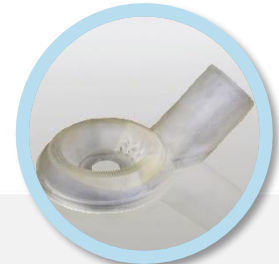
Ultracur3D® ST 45 (B/M)

Tough | Fast | Clear
Tough | Fast | Black
Tough | Precision | Clear



Ultracur3D® ST 7500 G

Tough | Durable | Grey



Ultracur3D® ST 80

Tough | Economic | Clear

Material Spotlight - Ultracur3D® ST 45 (B/M) – ST 4500 (B)*

Tough | Fast | Clear/Black



Tough resin with great mechanical performance and processing speed

- Excellent strength, toughness and impact resistance
- Outstanding printing speed
- Great surface quality
- ST 45 M version has a lower curing depth for higher z-resolution
- Biocompatibility (passes ISO 10993-5,-10)

Color

Clear & black

Applications

Functional parts requiring high accuracy and toughness; housings and covers; tools and manufacturing aids; orthotic devices and braces

Leak testing tool for battery assembly lines (Valiant TMS)



Orthobox designed by Accante to facilitate application of brackets by orthodontists



Camera housing components in Origin printers, ST 45 B was used to replace CNC-ABS



* TPO-free version, currently in beta phase

Material Spotlight - Ultracur3D[®] ST 7500 G

Tough | Durable | Grey



Tough resin with high durability and fast easy printing

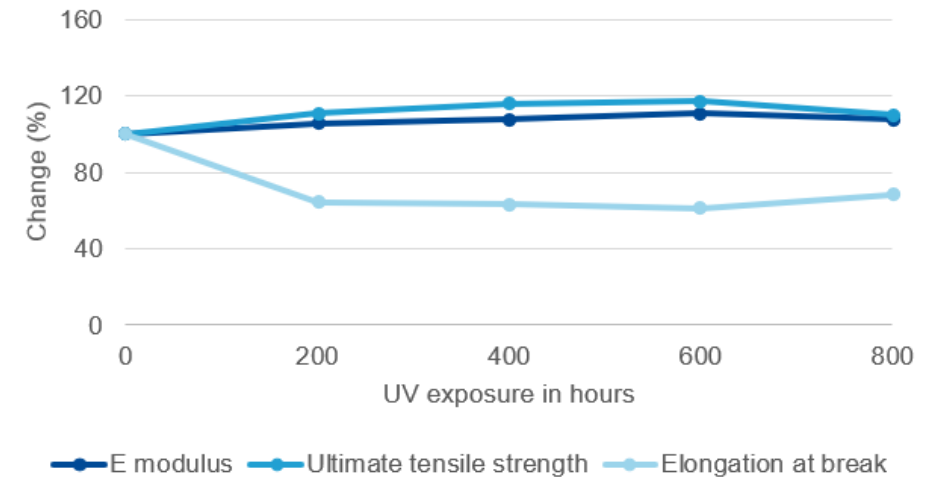
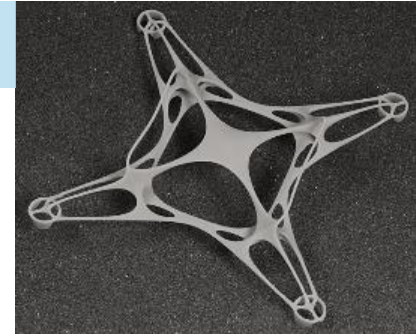
- Very fast and easy to print
- Excellent surface quality and intricate details
- Combining high toughness with UV weathering resistance, ideal for demanding outdoor applications
- Biocompatibility (passes ISO 10993-5,-10)
- TPO-free

Color
Grey

Applications

Functional parts or prototypes for outdoor use, figurines & hobby models

Drone part made with ST 7500 G



Stable performance in accelerated weathering test (ISO 4892-2 UV light + water spray)

Ultracur3D® Portfolio

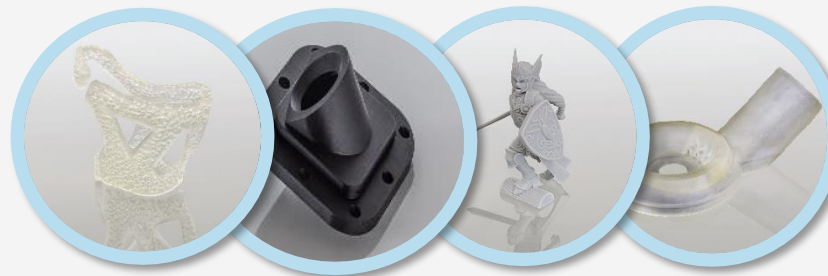
Products at a Glance



Ultracur3D® ST

Tough, multi-purpose resins

- Multi-purpose materials for a wide range of applications
- Superior toughness and impact resistance



Ultracur3D® Portfolio

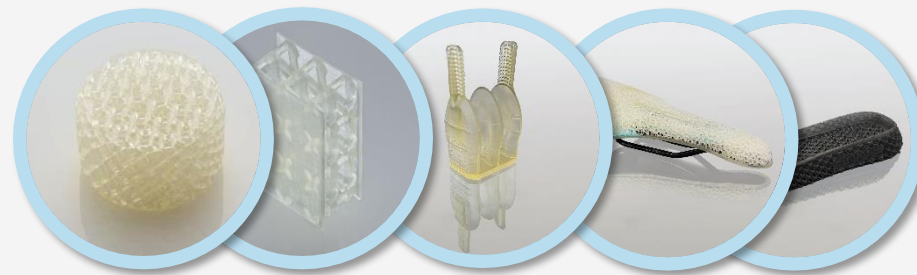
Products at a Glance



Ultracur3D® FL / EL

Flexible and elastomeric resins

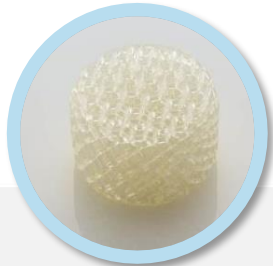
- Excellent performance for applications requiring elasticity and flexibility
- Covering a wide range of shore hardness combined with superior elongation at break



Ultracur3D[®] FL / EL

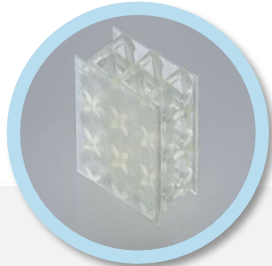
Flexible and Elastomeric Resins

- Excellent performance for applications requiring elasticity and flexibility
- Covering a wide range of shore hardness combined with superior elongation at break



Ultracur3D[®] FL 300

Flexible | 40 A | Clear



Ultracur3D[®] FL 60

Flexible | 60 A | Clear



Ultracur3D[®] EL 60

Flexible | 75 A | Clear



Ultracur3D[®] EL 150

Flexible | 80 A | Clear



Ultracur3D[®] EL 4000 (B)

Flexible | 90 A | Clear
Flexible | 90 A | Black

Material Spotlight - Ultracur3D® EL 4000 (B)

Flexible | 90 A | Clear/Black



Flexible 90A resin with high strength and rebound

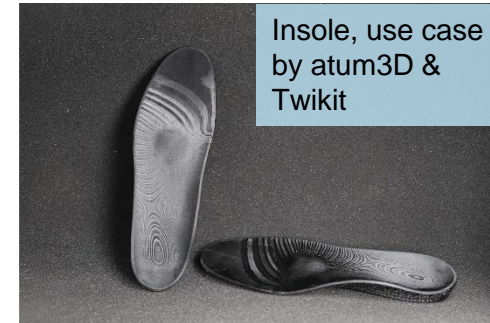
- High hardness (Shore 90A)
- Superior strength, rebound and tear resistance
- Fast elastic response, resembling conventional elastomers
- Easy to print due to high green strength and low viscosity
- Low glass transition, good cold temperature performance
- One-component, single-cure system
- Compatible with Ultracur3D® Coat F+

Color

Clear & black

Applications

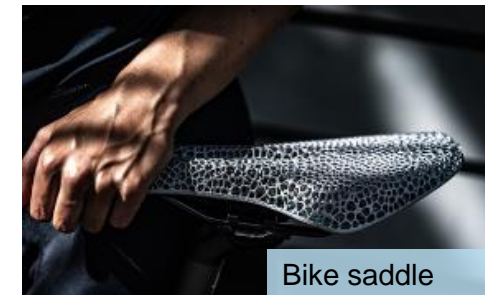
Consumer goods like footwear, bicycle saddles and handles, soft tooling, brushes, robotic grippers



Insole, use case by atum3D & Twikit



Robotic gripper made with EL 4000 B, use case by atum3D



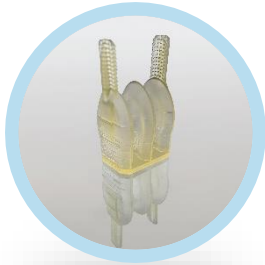
Bike saddle



FORWARD | BASF
Ultracur3D® EL 4000
Drop Tower Test

Material Spotlight - Ultracur3D[®] EL 60

Flexible | 75 A | Clear



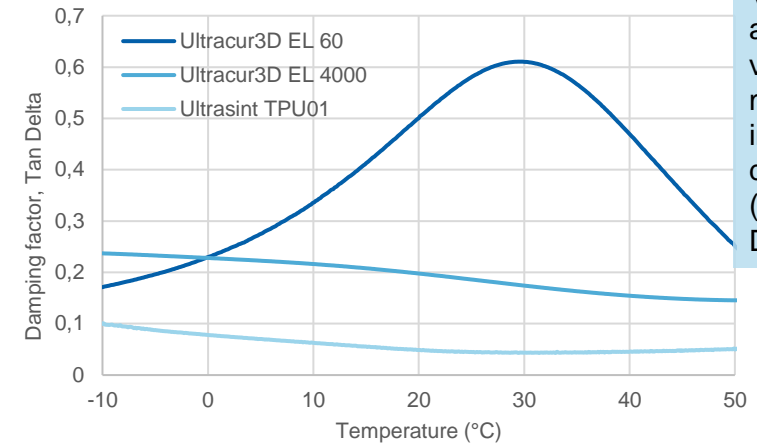
Flexible 75A resin with superior energy absorption

- Medium hardness (Shore 75A)
- Superior energy and shock absorption
- Low water uptake
- Cost-effective solution for flexible applications
- One-component, single-cure system
- Biocompatibility (passes ISO 10993-5,-10)
- Compatible with Ultracur3D[®] Coat F+

Color
Clear

Applications

Protective gear like helmets, cushioning pads and shock absorbers, soft tooling

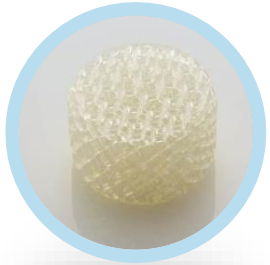


Very high energy absorption of EL 60 vs. other flexible materials, as indicated by the damping factor (Tan Delta) in a DMA measurement



Material Spotlight - Ultracur3D® FL 300

Flexible | 40 A | Clear



Flexible 40A resin, extremely soft and elastic

- Very soft, comparable to a silicone (Shore 40A)
- Superior elongation at break
- Very low viscosity
- Very good performance in cyclic loading (Rossflex >100k cycles)
- Low glass transition, good cold temperature performance
- Biocompatibility (passes ISO 10993-5,-10)
- One-component, single-cure system
- Compatible with Ultracur3D® Coat F+

Color

Clear

Applications

Seals and gaskets, consumer goods like wristbands, electrical/thermal insulators, anatomical models

Watch band with
Ultracur3D® Coat F+



Anatomical
model



Soft touch
tooling, use
case with
Valiant



Ultracur3D® Portfolio

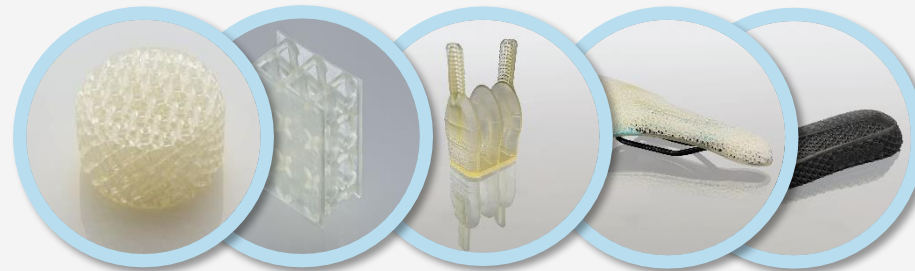
Products at a Glance



Ultracur3D® FL / EL

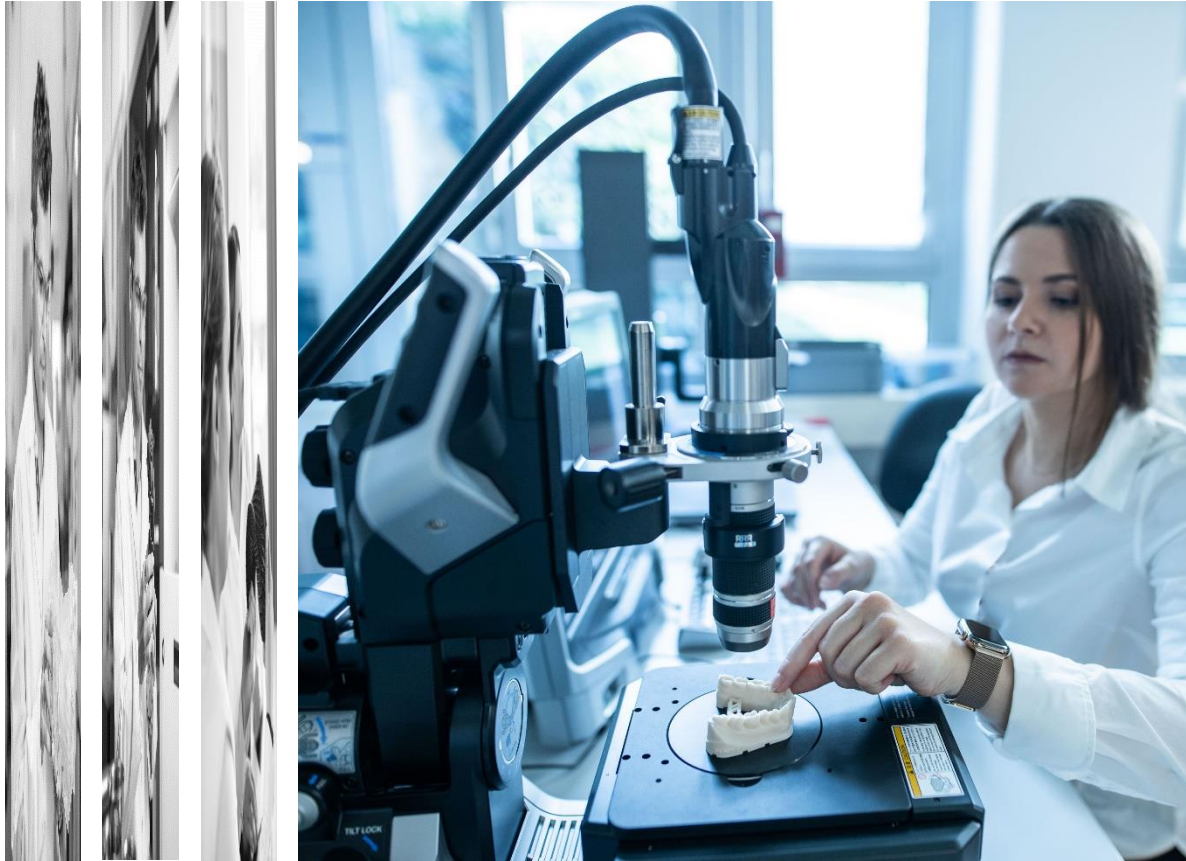
Flexible and elastomeric resins

- Excellent performance for applications requiring elasticity and flexibility
- Covering a wide range of shore hardness combined with superior elongation at break



Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® DM Dental resins

- Optimized performance for use in dental applications
- Cost-effective and scalable solutions for dental industries



Ultracur3D[®] DM

Dental Resins

- Optimized performance for use in dental applications
- Cost-effective and scalable solutions for dental industries



Ultracur3D[®] DM 2505

Dental | Dental Model | Beige



Ultracur3D[®] DM 2304

Dental | Gingiva Mask | Pink

Material Spotlight - Ultracur3D[®] DM 2505

Dental | Dental Model | Beige



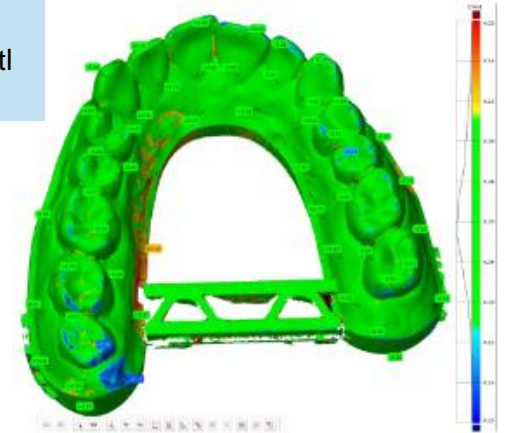
Rigid resin, perfect solution for dental models and molds

- Enables precise manufacturing of dental models and molds
- Ideal for thermoforming
- Parts can be washed with water, no chemicals needed

Color
Beige

Applications
Dental models & molds

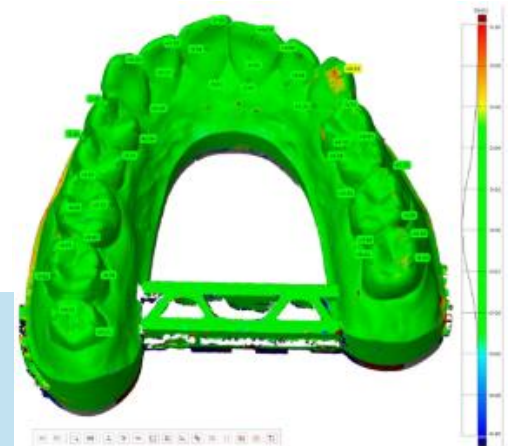
Printed part
vs. original stl
($\pm 100\mu\text{m}$)



Accuracy scans of printed molds. More data available on the extended TDS and in our Accuracy Evaluation Study.

[Extended TDS](#)
[Accuracy evaluation study](#)

Part before vs.
after thermoforming
($\pm 50\mu\text{m}$)



Ultracur3D® Portfolio

Products at a Glance



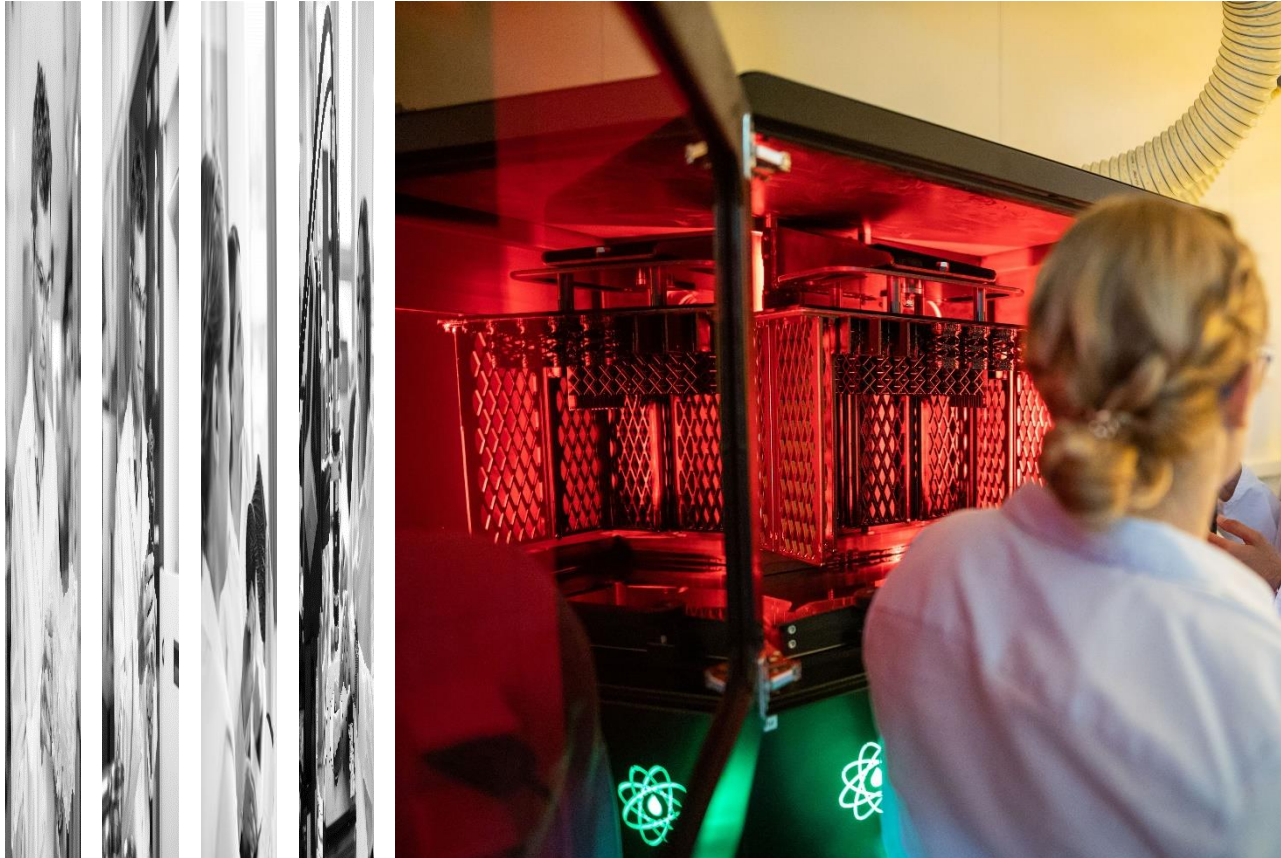
Ultracur3D® DM Dental resins

- Optimized performance for use in dental applications
- Cost-effective and scalable solutions for dental industries



Ultracur3D® Portfolio

Products at a Glance



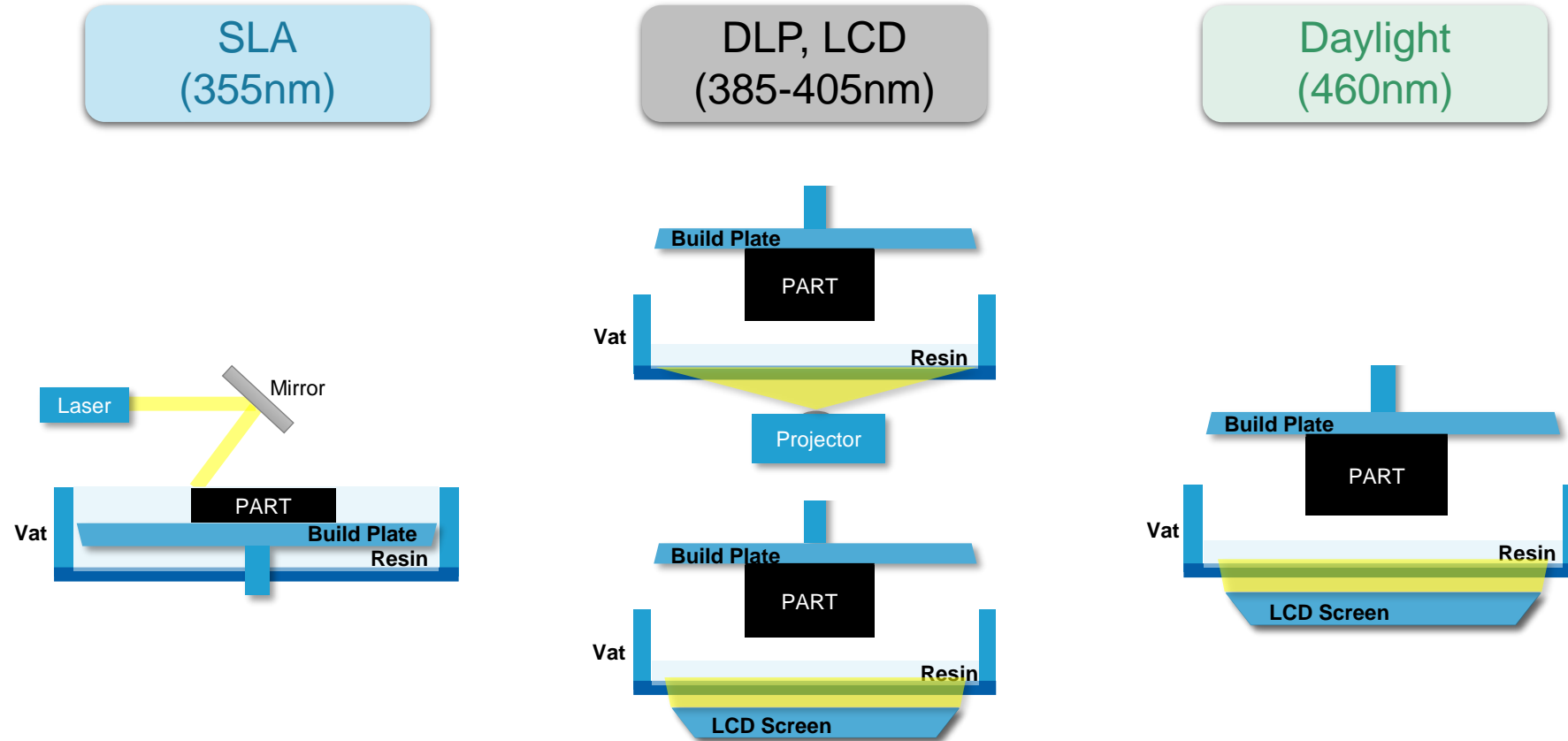
Ultracur3D® EPD

Daylight resins

- LCD daylight technology to enable economic and large-scale production
- Increased throughput and productivity



Ultracur3D® - Technology-Specific Product Lines Overview



Ultracur3D® - Technology-Specific Product Lines Overview

High stiffness
and HDT



High toughness
and elongation
at break

SLA
(355nm)

DLP, LCD
(385-405nm)

Daylight
(460nm)

SLA 7700

RG 1100

RG 35

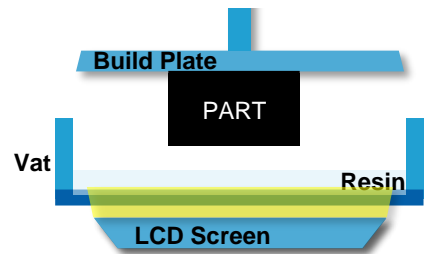
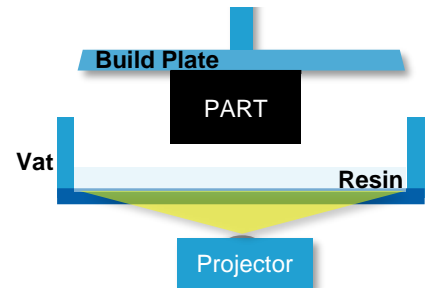
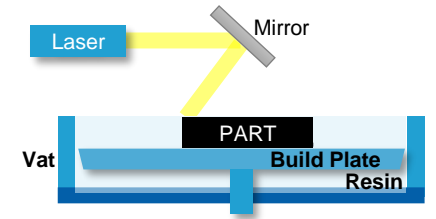
ST 7500

ST 45

ST 1400

EPD 2006

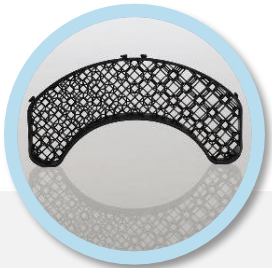
EPD 1086



Ultracur3D® EPD

Daylight Resins

- LCD daylight technology to enable economic and large-scale production
- Increased throughput and productivity



Ultracur3D® EPD 1086

Daylight | General purpose
| Black



Ultracur3D® EPD 2006

Daylight | Rigid | Black

Material Spotlight - Ultracur3D® EPD 2006

Daylight | Rigid | Black

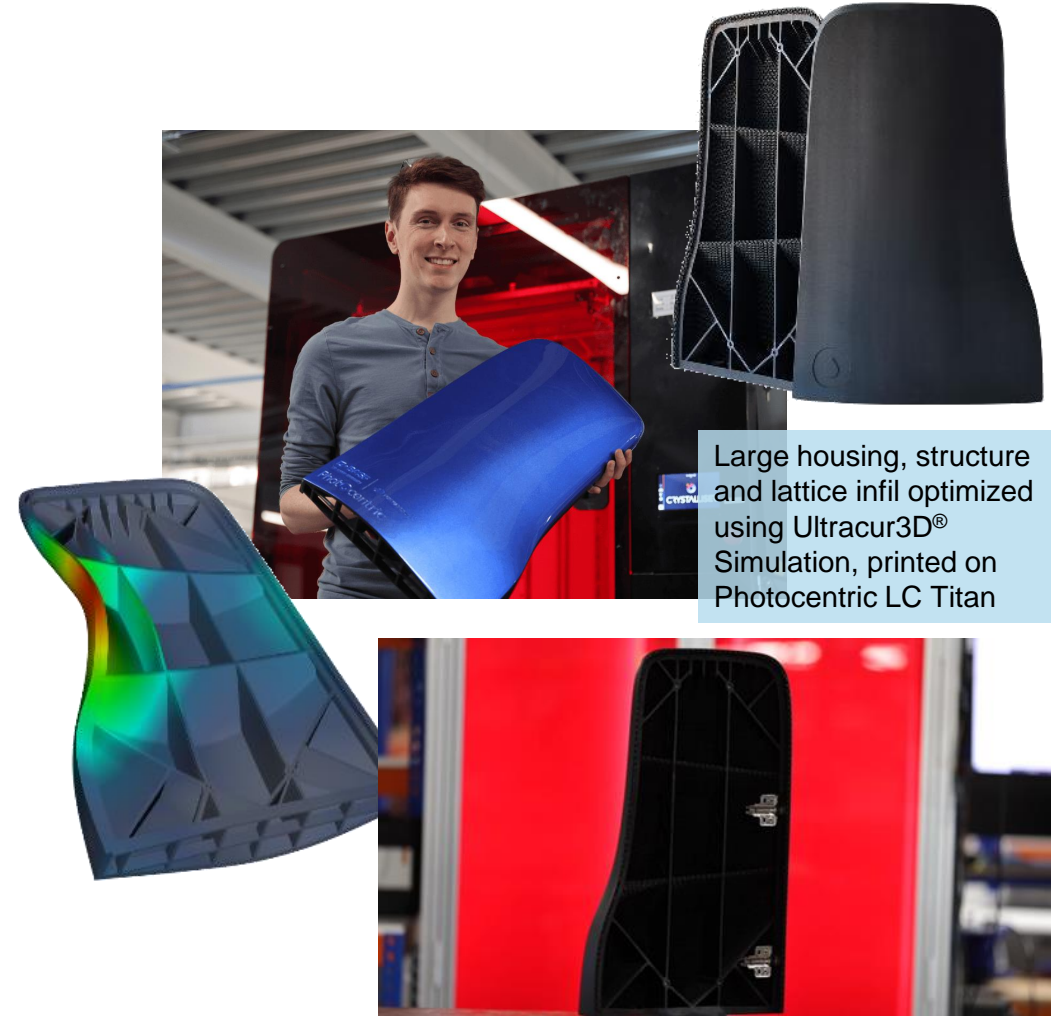


Rigid daylight resin with high stiffness and temperature resistance

- Very high stiffness and temperature resistance
- Ideal for large-scale objects
- Excellent surface quality and intricate details
- Biocompatibility (passes ISO 10993-5,-10)

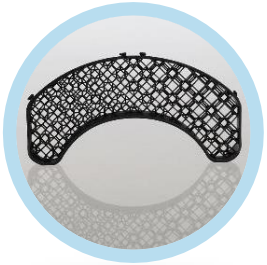
Color
Black

Applications
Small series parts, large covers and housings



Material Spotlight - Ultracur3D® EPD 1086

Daylight | General purpose | Black

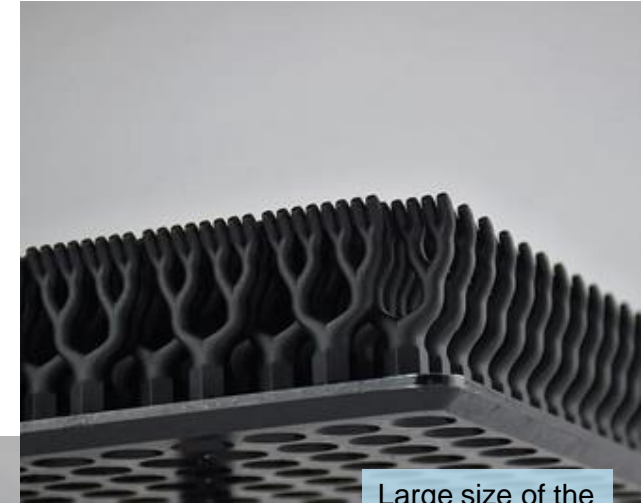


Multi-purpose daylight resin with high toughness and durability

- Very high toughness and durability
- Scalable, cost-effective solution for a wide range of applications
- Excellent resistance against water, chemicals and UV weathering

Color
Black

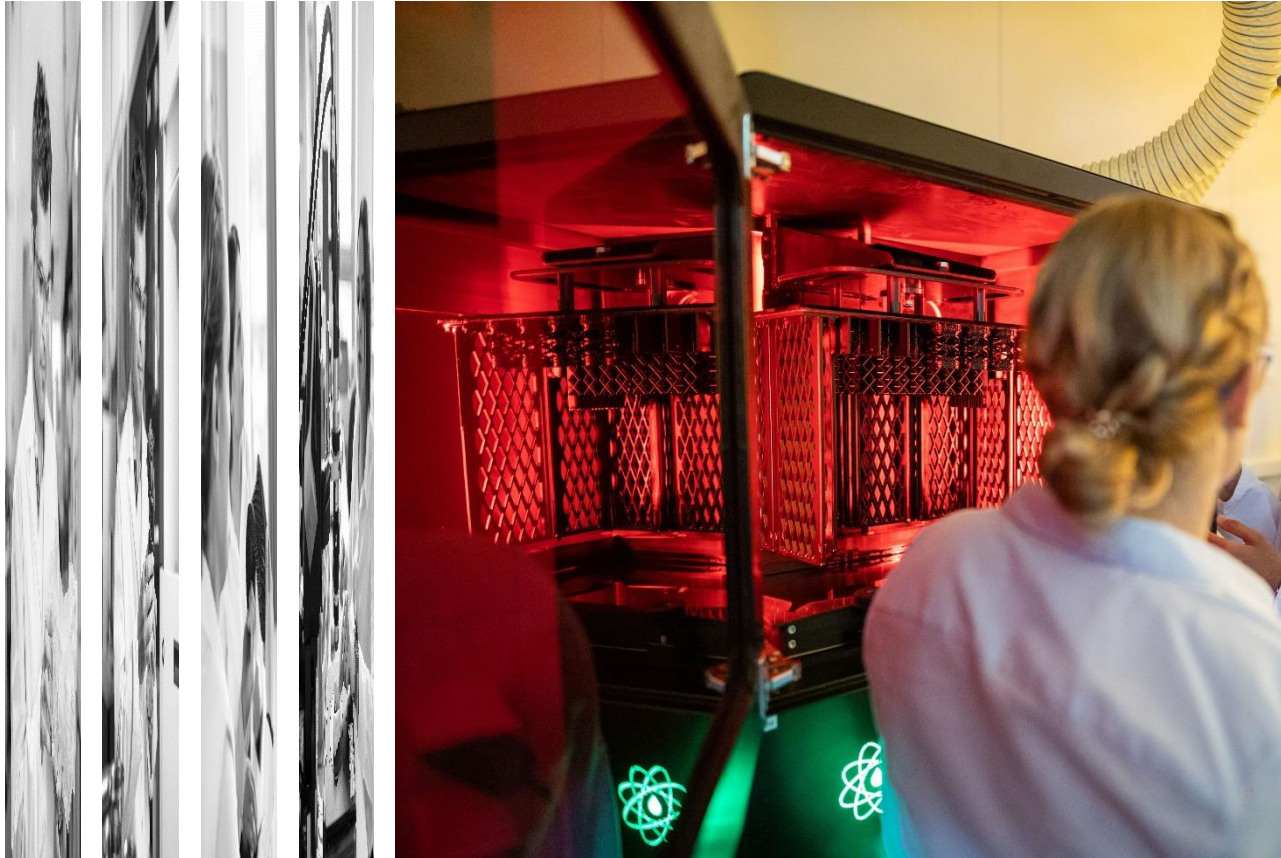
Applications
Durable small series parts, customized gadgets and tools



Large size of the build tray in Daylight technology enables printing of series and large parts in EPD 1086 (Sculpteo)

Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® EPD

Daylight resins

- LCD daylight technology to enable economic and large-scale production
- Increased throughput and productivity



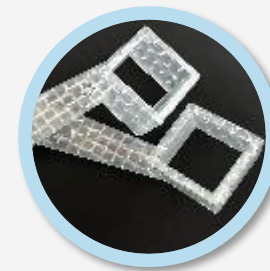
Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® SLA SLA resins

- Printing of very large and precise parts
- Reliable large-scale production on big SLA systems



Ultracur3D® SLA

SLA Resins

- Printing of very large and precise parts
- Reliable large-scale production on big SLA systems



Ultracur3D® SLA 7700

SLA | General-purpose
| Ultraclear

Material Spotlight - Ultracur3D[®] SLA 7700

SLA | General-purpose | Ultraclear



General purpose SLA resin, easy-to-print and exceptional part clarity

- Exceptional optical clarity
- Easy and reliable printing on large-vat systems
- Excellent accuracy, detail and surface finish
- Minimal material shrinkage, ideal for printing large parts
- Very high resistance to water and chemicals

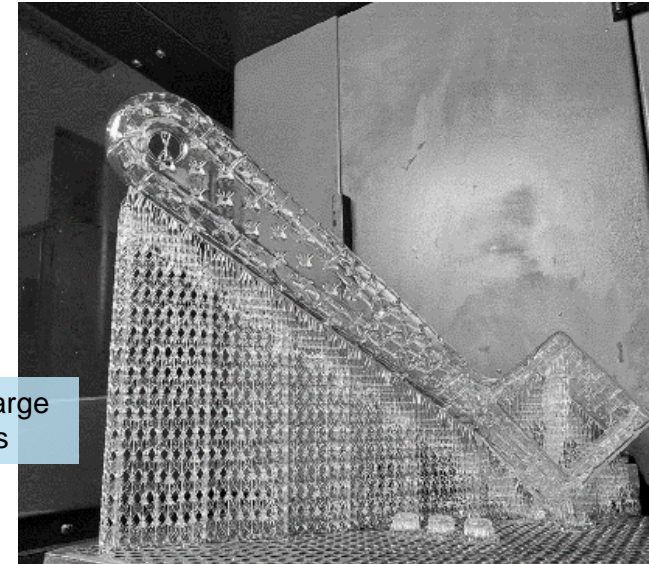
Color

Ultraclear

Applications

Aesthetic and functional prototypes and concept models for consumer, automotive and aerospace industries; vacuum and investment casting patterns

Printing of large & clear parts



Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® SLA SLA resins

- Printing of very large and precise parts
- Reliable large-scale production on big SLA systems



Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® Supplementary products

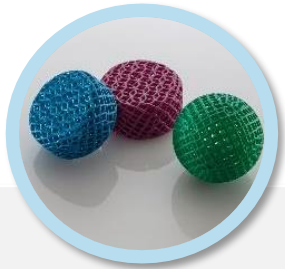
- Supporting products to enable easier and more versatile processing
- Enabling a wide range of colors and finishes for printed parts



Ultracur3D®

Supplementary Products

- Supporting products to enable easier and more versatile processing
- Enabling a wide range of colors and finishes for printed parts



Ultracur3D® Coat F+

Flexible coatings



Ultracur3D® CK

Color kits

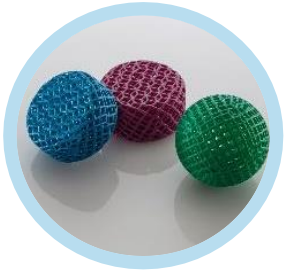


Ultracur3D® Cleaner

Cleaning solution

Material Spotlight - Ultracur3D[®] Coat F+

Flexible coatings



Flexible coating solution to improve part properties and appearance

- Waterborne polyurethane coating
- Unlimited possibilities in colors and effects
- Good wear and scratch resistance
- Excellent flexibility and surface haptic
- Biocompatible
- Good adhesion on wide range of materials

Compatibility

Ultracur3D[®] EL/FL Line, Ultrasint[®] TPU Line, Ultrasint[®] PA Line, Ultrafuse[®] TPU Line

Colors

Jet black, pure white, pure red, purple violet, signal orange, canola yellow, grass green, light blue, metallic silver, metallic blue

Applications

Automotive interior, footwear, consumer goods, O&P

Ultracur3D[®]
EL/FL Line



Ultrasint[®] TPU Line



Ultrasint[®]
PA Line

Ultrafuse[®]
TPU Line



Material Spotlight - Ultracur3D® CK

Color kits



Color kit solution enabling parts in a wide range of colors without the need for post-processing

- Color mixing solution, add to your base resin before printing
- Add color to your parts without the need for post-processing

Compatibility

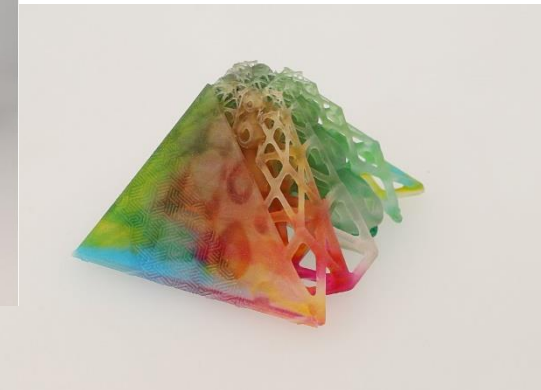
Ultracur3D® entire resin portfolio

Colors

White, yellow, cyan, magenta and black

Wide range of colors without post-processing. User guideline with suggested mixing ratio's.

[User guideline](#)



Ultracur3D® Portfolio

Products at a Glance



Ultracur3D® Supplementary products

- Supporting products to enable easier and more versatile processing
- Enabling a wide range of colors and finishes for printed parts



Ultracur3D® - Overview Engineering Grades

	Flexible					Tough				Rigid				Daylight		SLA
	FL 300	FL 60	EL 60	EL 150	EL 4000	ST 80	ST 1400	ST 45	ST 7500	RG 35	RG 1100	RG 9400	RG 3280	EPD 1086	EPD 2006	SLA 7700
Young's modulus (MPa)						1500	1900	2300	2300	2600	3080	3900	10600	1810	2370	2250-2550
Tensile strength (MPa)	5	4	9	7	11	35	45	60	54	80	70	78	87	42	50	46-51
Elongation at break (%)	245	90	95	182	170	20	43	25	13	6	5	3	1.3	26	10	5-15
Hardness	40 A	60 A	75 A	80 A	90 A	80 D	78 D	80 D	82 D	85 D	85 D	88 D	96 D	81 D	80 D	80 D
Notched izod, 23°C (J/m)						24	43	30	25	23	16	20	24	28	11	25
HDT - 0.45 MPa (°C)						46	57	73	64	83	116	255	284	53	81	51
HDT - 1.82 MPa (°C)						42	48	61	54	64	84	86	132	46	61	50
Viscosity, 30 °C (mPas)	160	400	3400	90	350	400	280	210	130	600	200	490	230	450	310	330
Flammability										HB (1.5mm)	HB (1.5mm)	V-0 (2.0mm)	HB (1.5mm)	HB (1.5mm)	HB (1.5mm)	HB (1.5mm)
Available color(s)	clear	clear	clear	clear	clear, black	clear	clear	clear, black	grey	clear, black	clear, black	black	white	black	black	ultraclear
Biocompatibility data	available		available	available	available	available	available	available	available	available			available	available		
Water resistance	★★	★★	★★★	★★	★★	★★★	★★★	★	★★★	★★★	★★★	★★★	★★★	★★★	★★★	★★★
Chemical resistance	★		★	★	★	★★		★★	★★	★★★	★★★	★★★	★★★	★★	★★★	★★★
UV weathering resistance	★	★★★		★★	★★★	★★★	★★	★	★★	★★	★★	★★★		★★	★	★★
Printing speed	★★★	★★★	★	★★★	★★	★★	★★	★★★	★★★	★	★★★	★★★	★★	★★	★★	★★
Compatible technologies	DLP, LCD	DLP, LCD	DLP, LCD	DLP, LCD	DLP	DLP, LCD	DLP, LCD	DLP, LCD	DLP, LCD	DLP, LCD	DLP, LCD	DLP, LCD	DLP, LCD	Daylight	Daylight	SLA

Product Naming

Ultracur3D® Photopolymers



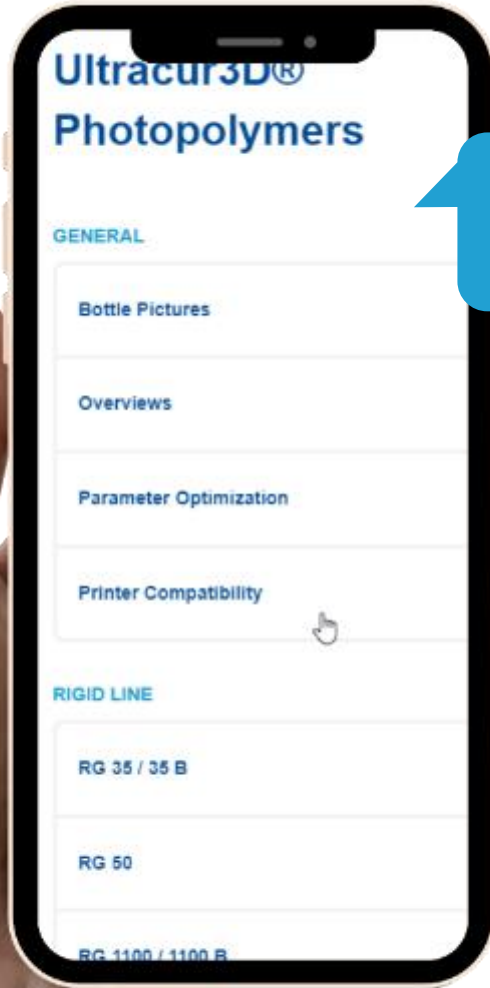
1st name (e.g. Safety Data Sheet, Purchase Orders)

2nd name (e.g. TDS, brand label, marketing material)

Ultracur3D®	RG	1100	B		Rigid	HDT 100	Black
Registered trade mark for BASF's photopolymer resins for 3D Printing	<p>Product line</p> <ul style="list-style-type: none"> FL/EL = Flexible ST = Tough RG = Rigid DM = Dental EPD = Daylight SLA = SLA CK = Color Kit 	<p>2 to 4 numbers, usually based on history/ development, no direct link to material properties</p>	<p>Color of the resin</p> <ul style="list-style-type: none"> No letter = clear B = black G = grey N = natural, light beige T = tan, dark beige W = white <p>Exception: all EPD products are black</p>	<p>Special material property, if applicable</p> <p>M = modified FR = flame retardant</p>	Product line	Main characteristic of the material, main USP that distinguishes it from other materials	Color of the resin

Partner Resource Center

Available Product Information across All Technologies



All information available in the Partner Resource Center

[Partner Resource Center](#)

Overviews:

- Material overview & comparison
- Printer compatibility, parameter optimization
- Summary of available tests e.g. chemical & UV resistance, biocompatibility

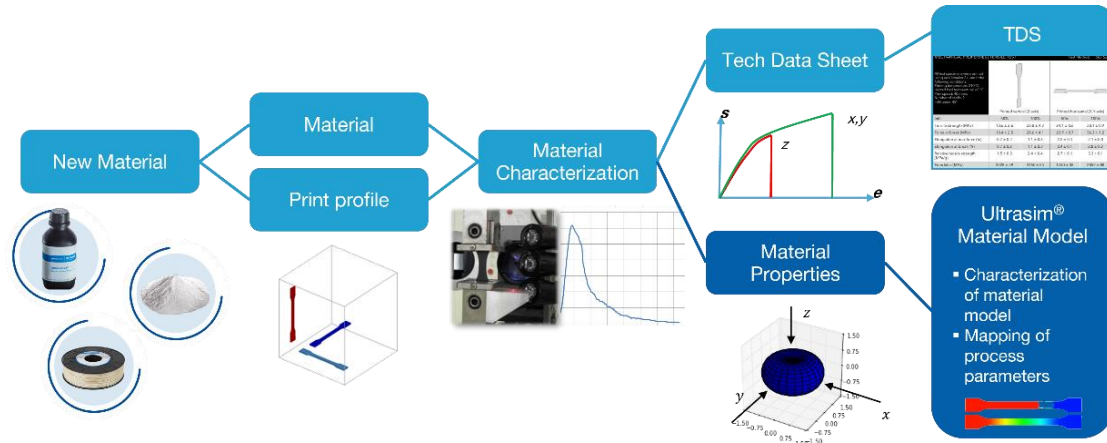
Product-related:

- Extended TDS
- User guidelines
- Images, videos and STLs
- Use cases & studies

AROUND 950 FILES AVAILABLE

Additive Manufacturing Solutions

BASF material modeling workflow



Ultrasim3D[®] simulation (FEA)

3D Simulation helps you to speed up the engineering process using a digital twin. We offer 3 easy methods to get started:

Raw Material Data	3D Simulation	Material Model as a Service
<p>Starter:</p> <p>Get the curves behind our TDS data to start basic simulation work.</p>	<p>Premium:</p> <p>We run the simulation for you. We help you to speed up your engineering process and increases confidence in part performance using a digital twin of your part.</p>	<p>Enterprise:</p> <p>Use our in-house developed material models for 3D-Printing incl. anisotropy of the process and FEA support of our experienced virtual engineers.</p> <ul style="list-style-type: none"> ■ Anisotropic ■ Nonlinear ■ Strain-rate sensitive ■ Tensile-compression asymmetry ■ Failure modelling ■ Temperature dependent

Quality Standards and Regulatory Compliance

BASF Forward AM Quality standards

- ISO & ASTM testing standards for all materials
- ISO 9001 certification for all production sites
- ISO 14001 certification for our HQ in Heidelberg
- Thorough QC, batch traceability and CoA for every batch

BASF Forward AM regulatory and EHS compliance

- Worldwide availability of our products
- Safety data sheets and product labels provided in local language and fully compliant to local laws and regulations
- Thorough knowledge of the chemical composition, including impurities and side products, allowing proper classification
- Strictly following import regulations and local inventories e.g. REACH, RoHS, SVHC, TSCA (statements available on request)





Our Mission

“

**We enable our customers
to shape the Additive
Manufacturing industrial
revolution.**

”



THE ONLY WAY FORWARD IS TOGETHER

The future of 3D printing depends our ability to work together to create value

Any questions left?

Let's talk!



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We create chemistry



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Innovating Additive Manufacturing