Graphy

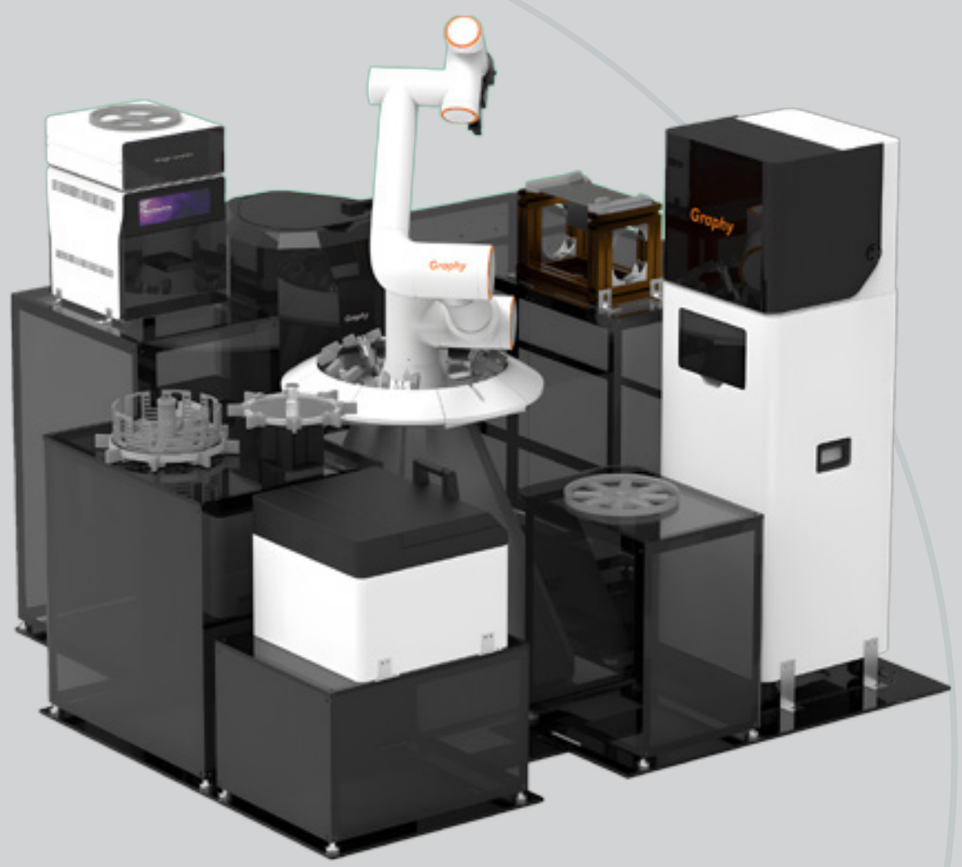
3D Print the World with Graphy's Solutions

DIAR TAJHIZ
ONGOING SMILES

Exclusive Distributor
021-24816

Graphy

3D Print the World with Graphy's Solutions



The world's first direct 3D-printable

Shape Memory Aligner®

Graphy inc. is a premier manufacturer and supplier of advanced photopolymer resins for 3D printing, boasting an extensive array of domestic and international patents. We specialize in materials for various industries, especially the dental sector, where our products have been clinically validated and acclaimed for their superior quality, significantly enhancing our global market presence.

We have achieved recognition for our technological innovation, particularly with the development of the world's first Shape Memory Aligner@ for orthodontics and top-tier permanent materials for Crown & Bridge applications (TC-S0DP/BR-23). Our materials are non-toxic, hypoallergenic, and biocompatible, meeting high standards of strength, heat resistance, and precision. This expertise simplifies and shortens dental manufacturing processes by tackling complex preparation and post-processing challenges.

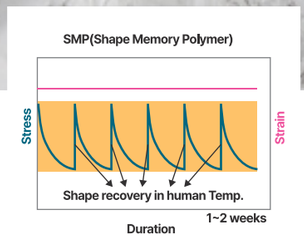
Graphy is also at the forefront with the world's first 3D printable shape-memory transparent orthodontic material. Our diverse range of photopolymer resins is ideal for applications such as flexible dentures, permanent prostheses, denture bases, models, and surgical guides. We provide comprehensive solutions bolstered by advanced software and hardware.

Our ongoing commitment is to continue innovating and introducing specialized materials for the dental and biotech industries, aiming to set future industry standards and spearhead market innovations.

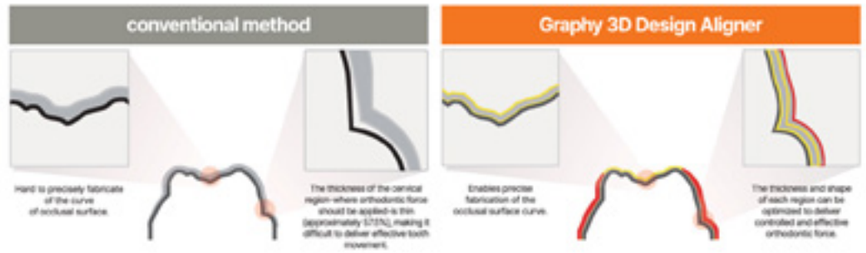
UNIZ NBEE

AccuFab CELL

UNIZ UBEE



This innovative Graphy's world-first directly 3D printable material for aligners breaks the preexisting concept of clear aligners and offers a significant advancement in digital dentistry.



Proven clinical effectiveness in the thesis

The mechanical properties of the 3D printed Shape Memory Aligner® using the Tera Harz Clear showed no change in properties even one week after the patient wore it.
(quoted from: European Journal of Orthodontics, 2021, 1–5 / doi: 10.1093/ejo/cjab022 / University of Zurich / Dr. Nearchos Panayi)

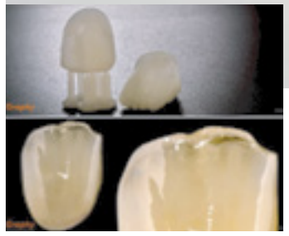
Properties	Unit	TC-85	TA-28	TR-07	Remark
Color	-	Clear	Clear	Clear	
Density	g/cm³ @ 25 °C	1.061 ± 0.02	1.091 ± 0.02	1.064 ± 0.02	
Viscosity	cps @ 25 °C	800 ± 200	700 ± 200	800 ± 200	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	≥ 98	≥ 98	
Shore Hardness (D)	-	≥ 85	≥ 85	≥ 85	
Flexural Strength	MPa	≥ 50	≥ 70	≥ 60	ISO 20795-2
Flexural Modulus	MPa	≥ 1500	≥ 2000	≥ 1600	ISO 20795-2
water solubility	μg/mm³	2.0	≤ 0.5	1.0	ISO 20795-2

Permanent C&B
(TC-80DP)

Tera Harz C&B(TC-BOOP) is a permanent C&B resin with the world's highest flexural strength (ISO-10477). TC-BOOP has obtained KFDA Class II, CE Class II-a medical device certification, which means its stability of physical properties is approved by the international authorities. TC-BOOP is an internationally validated 30 printing material, suitable for both temporary and permanent treatments, ranging from single crowns to full bridges.

Properties	Unit	TC-80DP	Remark
Color	-	A1, A2, A3, B1, OM1	
Density	g/cm³ @ 25 °C	1.076 ± 0.02	
Viscosity	cps @ 25 °C	2000 ± 300	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (D)	-	≥ 90	
Bi-axial Flexural Strength	MPa	≥ 350	ISO 6872
Flexural Strength	MPa	160(ISO Standard), 220(Graphy Standard)	ISO 10477
Flexural Modulus	MPa	3500(ISO Standard), 4500(Graphy Standard)	ISO 10477
water sorption	μg/mm³	18.9	ISO 10477
water solubility	μg/mm³	0.5	ISO 10477

Permanent C&B
(BR23)
Opaque, A/8/C/D shade



Courtesy of Chang-Woo Woo, MSE, PhD
YONSEI UNIVERSITY COLLEGE OF DENTISTRY, SEOUL. KOREA

Courtesy of Dr. Katsuhiro Asaka, DDS, PhD, Japan
Doctor of Dentistry, Matsudo School of Dentistry, Japan University

This is the best material for implant prosthetics or natural tooth prosthetics for bridges. It was developed to be used as a resin for permanent dental crowns for bridges. Has been verified for its physical stability and obtained MFDS Class 2 and CE Class IIa. The material has a soft, stable bond and high elongation. It can be used temporarily or permanently for all indications, including full-mouth bridges, and is a 30 printer-specific material. Its high flexural strength and abrasion resistance ensure exceptional durability, while its absorbency and solubility make it ideal for long-term prosthetics. In addition, the material has the advantage of being applicable to a variety of treatment validations.
Key Features: non-toxic, biocompatible, with high bending and tensile strength; suitable for various applications, including long bridges, C&B, inlays, onlays, veneers, and more.

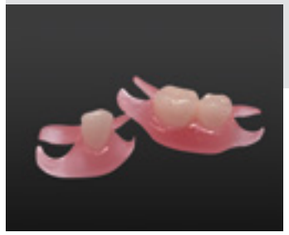
Properties	Unit	BR-23	Remark
Color	-	A,B,C,D, OM	
Density	g/cm³ @ 25 °C	1.015 ± 0.02	
Viscosity	cps @ 25 °C	1300 ± 300	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (D)	-	≥ 85	
Flexural Strength	MPa	≥ 100	ISO 10477
Flexural Modulus	MPa	≥ 2500	ISO 10477
water sorption	μg/mm³	10	ISO 10477
water solubility	μg/mm³	0.2	ISO 10477

Denture Base
(THD)

Tera Harz Denture Base (THO) is removable and offers high patient satisfaction, thanks to its excellent color stability and durability against significant water sorption. When used with Graphy's permanent materials, it guarantees the best strength and stability and esthetical performance, ensuring optimal results to the patients.

Properties	Unit	THD	Remark
Color	-	Magenta	
Density	g/cm³ @ 25 °C	1.063 ± 0.02	
Viscosity	cps @ 25 °C	1500 ± 300	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (D)	-	≥ 85	
Flexural Strength	MPa	140(ISO Standard), 190(Graphy Standard)	ISO 20795-1
Flexural Modulus	MPa	3000(ISO Standard), 3900(Graphy Standard)	ISO 20795-1
water sorption	μg/mm³	15.9	ISO 20795-1
water solubility	μg/mm³	0.6	ISO 20795-1

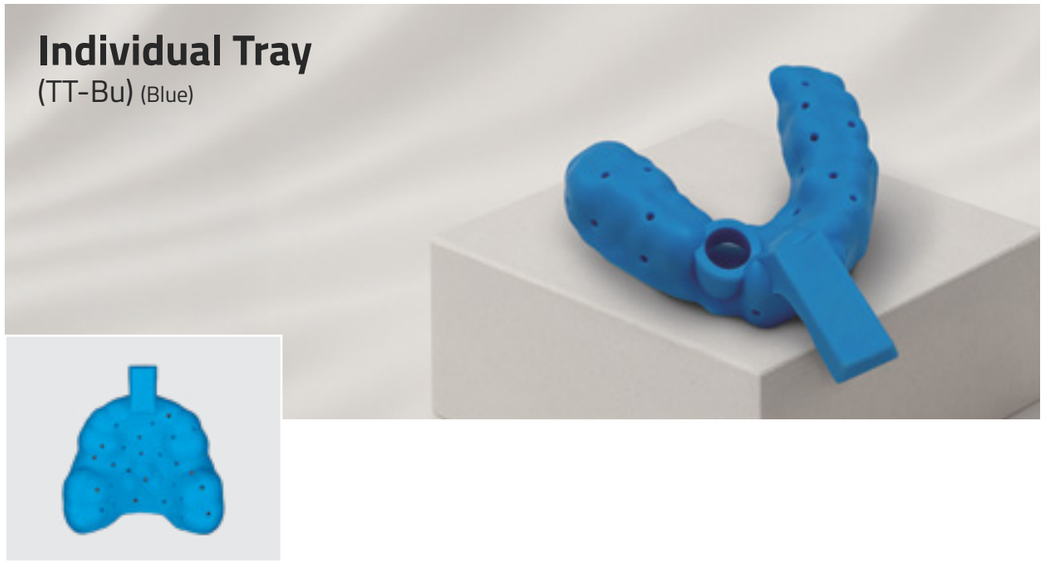
Flexible Denture
(TFDH)



Tera Harz Flexible Denture (TFDH) is a resin for flexible and removable partial dentures.
This material is ideal for filling gaps caused by missing teeth, preventing adjacent teeth from shifting, and its soft composition ensures easy wear and removal.
When used with Graphy's permanent materials, it guarantees the best strength and stability and esthetical performance, delivering optimal results for patients.

Properties	Unit	TFDH	Remark
Color	-	Magenta	
Density	g/cm³ @ 25 °C	0.998 ± 0.02	
Viscosity	cps @ 25 °C	700 ± 200	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (D)	-	≥ 80	
Flexural Strength	MPa	≥ 110	ISO 20795-1
Flexural Modulus	MPa	≥ 2800	ISO 20795-1
water sorption	μg/mm³	10.8	ISO 20795-1
water solubility	μg/mm³	1.4	ISO 20795-1

Individual Tray
(TT-Bu) (Blue)



The individual tray (custom tray) is used in prosthodontic treatments that require highly accurate impression taking, such as implant restorations, complete dentures, and partial dentures. Using CAD software, the tray can be digitally designed to match the patient's oral anatomy, and 3D printing allows for fast and precise fabrication.
This digital workflow enhances impression accuracy, enables easy reproduction and modifications, and reduces material waste, making it highly cost-efficient. Compared to manual fabrication, it also ensures consistent quality, improving both clinical efficiency and patient satisfaction.

Properties	Unit	TT-Bu	Remark
Color	-	Blue	
Density	g/cm³ @ 25 °C	1.04 ± 0.02	
Viscosity	cps @ 25 °C	600 ± 100	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (D)	-	≥ 80	
Flexural Strength	MPa	≥ 80	ISO 20795-1
Flexural Modulus	MPa	≥ 2000	ISO 20795-1
water sorption	μg/mm³	13.7	ISO 20795-1
water solubility	μg/mm³	1.6	ISO 20795-1

Surgical Guide
(SG-100)

Tera Harz Flexible Denture (TFDH) is a resin for flexible and removable partial dentures.
This material is ideal for filling gaps caused by missing teeth, preventing adjacent teeth from shifting, and its soft composition ensures easy wear and removal.
When used with Graphy's permanent materials, it guarantees the best strength and stability and esthetical performance, delivering optimal results for patients.

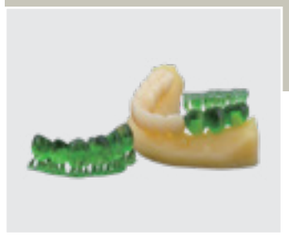
Properties	Unit	SG-100	Remark
Color	-	Clear	
Density	g/cm³ @ 25 °C	1.110 ± 0.02	
Viscosity	cps @ 25 °C	600 ± 200	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (A)	-	≥ 90	
Flexural Strength	MPa	≥ 110	ISO-20795-1
Flexural Modulus	MPa	≥ 2500	ISO-20795-1
Tensile Strength	MPa	≥ 60	ASTM D638
Tensile Modulus	MPa	≥ 2500	ASTM D638
Elongation	%	≤ 10	ASTM D638
Impact strength	J/m²	≥ 3000	ASTM D256
water sorption	μg/mm³	16.2	ISO-20795-1
water solubility	μg/mm³	0.6	ISO-20795-1

Model
(S-100M/S-200M)

One of the earliest and most common 30 printed creations used in dentistry is the dental model.
With the S-100M and S-200M material, traditional impressions are no longer necessary, as the intraoral scanner can be used to acquire oral data and the model can be created directly by the printer.
This saves dentists time and money in transferring a patient's intraoral image to its making, and the simplicity of the process brings a more accurate intraoral image as the fewer the steps of the whole process, the less the error is.

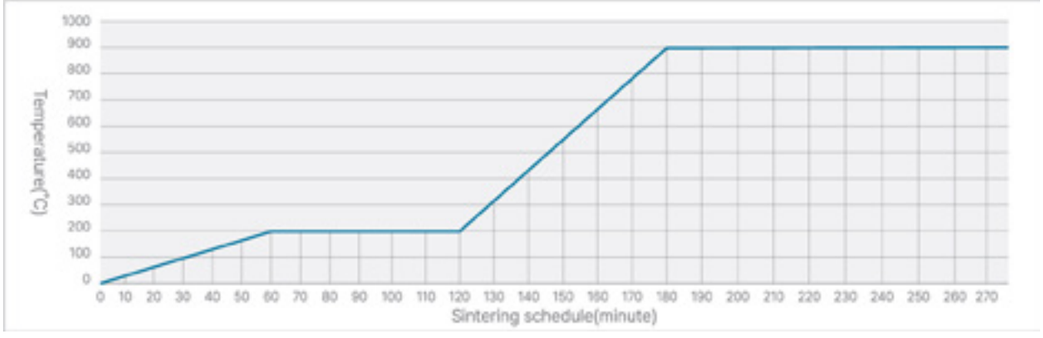
Properties	Unit	S-100M	S-200M	Remark
Color	-	Grey-Beige	Yellowish, Gray, Beige, White, Light Gray	
Density	g/cm³ @ 25°C	1.120 ± 0.02	1.116 ± 0.02	
Viscosity	cps @ 25 °C	600 ± 100	950 ± 100	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	≥ 98	
Shore Hardness (D)	-	≥ 90	≥ 90	
Flexural Strength	MPa	≥ 110	≥ 160	ASTM D790
Flexural Modulus	MPa	≥ 2500	≥ 3500	ASTM D790
Tensile Strength	MPa	≥ 75	≥ 100	ASTM D638
Tensile Modulus	MPa	≥ 2500	≥ 3500	ASTM D638
Elongation	%	≤ 10	≤ 5	ASTM D638
Impact strength	J/m²	≥ 2100	≥ 3000	ASTM D256 (Notched)

Castable
(SC-130)



Metal prostheses have such a long history in dentistry. Until now, metal prostheses have been made by using wax as a casting material, which requires a great deal of time and effort for specialized personnel to handle with precision. Now that 30 printers are widely used in the dental field, it is possible to design castings using 30 modeling and print them with precision and accuracy, allowing for faster and more accurate castings than ever before.

Properties	Unit	SC-130	Remark
Color	-	Green	
Density	g/cm³ @ 25 °C	1.110 ± 0.02	
Viscosity	cps @ 25 °C	100 ± 50	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	

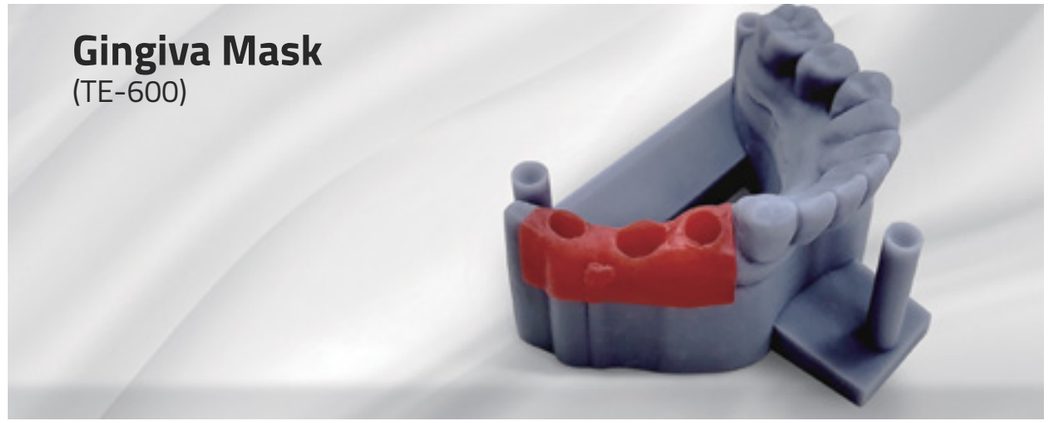


TE-151

The demand for flexible and elastic materials in dental applications such as mouthguards continues to grow. Most products of the materials like silicone are pretty much off-the-shelf, but dentistry requires personalized products, so it's very time-consuming and expensive to customize them.
However, when 3D printing the products, they can be made with a personalized design and that saves time and costs. This material was created to make that possible.

Properties	Unit	TE-151	Remark
Color	-	Clear	
Density	g/cm³ @ 25 °C	1.063 ± 0.02	
Viscosity	cps @ 25 °C	1300 ± 200	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (A)	-	≥ 75	
Tensile Strength	MPa	≥ 10	ASTM D638
Elongation	%	≤ 110	ASTM D638
Water sorption	μg/mm³	37.9	ASTM D638
Water solubility	μg/mm³	3.4	ASTM D638

Gingiva Mask
(TE-600)



Tera Harz Gingiva Mask is a gingiva-like material with a flexible and soft texture. It is ideal for combination with implant models. Tera Harz Gingiva Mask resin has excellent elasticity and tear resistance and reproduces the feeling of actual gums. Due to its high accuracy, the dental technician can print gingiva mask more easily, which perfectly fits the dental models, and with Its smooth surface finish ensures optimal aesthetic results.

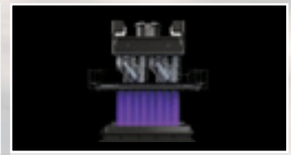
Properties	Unit	TE-600	Remark
Color	-	Red	
Viscosity	cps @ 25 °C	400 ± 100	BrookField
Solid content	% @ 80 °C x 1h	≥ 98	
Shore Hardness (A)	-	≥ 50	
Tensile Strength	MPa	≥ 1.5	ASTM D638
Tear Strength	kN/m	≥ 6	ASTM D638
Elongation	%	≥ 150	ASTM D638

Formlabs Form 4B

Core Features

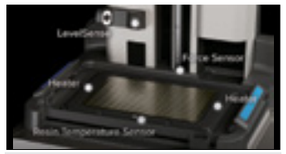
Low Force Display™

Minimizes peel forces for faster print cycles, better surface quality, and extended tank life-ideal for precise, high-volume dental production



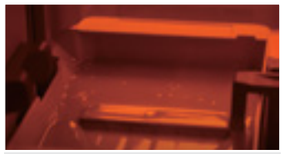
Backlight Unit

60 high-power LEDs with collimating lenses deliver uniform, high-intensity light for consistent layer curing-ensuring accuracy, detail, and repeatability across the entire build area



Smart Sensor System

Six sensors-including Z-axis force and ultrasonic resin sensing-automatically optimize print conditions for consistent, high-quality results



Advanced Resin Handling

Infrared heating and continuous mixing maintain resin between 25-45 °C, ensuring optimal flow, easier handling, and excellent accuracy and print quality

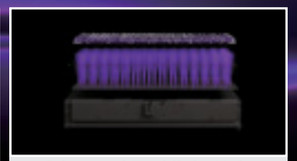
Description	Specification
Printing Speed	Avg. 40 mm/h / Max. 100 mm/h
Printing Technology	Low Force Display™ (LFD)
Build Volume	200 × 125 × 210 mm (W x D x H)
XY Resolution	50µm
Layer Thickness (Z resolution)	25–200µm
Support	Auto-generated / Light-touch removal
Dimension / Weight (incl. pkg.)	398 × 367 × 554 mm / 18.3kg
Working Temperature	Auto-heats resin to 25–45 °C (77–113 °F), depending on material
Power Requirement	100–240VAC /4.8A | 50/60Hz, 480W
Z-axis leveling method	Auto-calibrated platform
Connectivity	Wi-Fi (2.4 and 5 GHz; IEEE 802.11 b/g/n/ac, WPA/WPA2) Ethernet (1000 Mbit), USB-C 2.0
Optical System	60 uniform-wavelength LEDs, 405 nm, 16 mW/cm²
Control Pannel	7" touchscreen, PreForm software
Product Features	Fast, versatile, biocompatible materials, intuitive use

Formlabs Form 4BL

Core Features

Low Force Display™

Minimizes peel forces for faster print cycles, better surface quality, and extended tank life-ideal for precise, high-volume dental production



Advanced Backlight Unit

Features 145 high-intensity LEDs and collimating lenses, delivering uniform, ultra-high-pcwer light for rapid and precise resin curing across the entire build platform

Smart Sensor & Resin Control System

Six sensors, including z-axis force and resin level detection, work with IR heating and continuous mixing to maintain ideal print conditions-ensuring stable fklw, easy handling, and high-quality results

Large-Format Optimized

Infrared heating and continuous mixing maintain resin between 25-45°C, ensuring optimal flow, easier handling, and excellent accuracy and print quality

Description	Specification
Printing Speed	Avg. 24 mm/h | Max. 80 mm/h
Printing Technology	Low Force Display™ (LFD), Masked Stereolithography (MSLA)
Build Volume	353 × 196 × 350 mm (W x D x H)
XY Resolution	46 µm with anti-aliasing
Layer Thickness (Z resolution)	25–200µm
Support	Auto-generated / Light-touch removal
Dimension / Weight (incl. pkg.)	66.4 × 52.8 × 79.4 cm / 58.5 kg
Working Temperature	Auto-heats resin to 25–45 °C (77–113 °F), depending on material
Power Requirement	100–240VAC, 9A | 50/60Hz, 900W
Z-axis leveling method	Printer Leveling Sensor (auto)
Connectivity	Wi-Fi (2.4 & 5 GHz), Ethernet (1000 Mbit), USB-C 2.0
Optical System	145 LEDs, 405 nm, 16 mW/cm²
Control Pannel	7" touchscreen, PreForm software
Product Features	Fast, accurate, wide material compatibility via Open Material Mode

UNIZ NBEE

Core Features

High Efficiency Liquid Cooling

Maintains system temperature below 40°C

Micro-Stereo Composite

Patent low force peel technology

High Power Collimated Light

16mW/cm2 high power, 95% Uniformity

Resin Temperature Control System

Maintain optimal reaction Temp

Description	Specification
SMA Printing Speed	50μm – 1Hour | 100μm –30minutes
Printing Technology	LCD Stereo lithography Technlolgy
Build Volume	192 × 120 × 180 mm
XY Resolution	49.8 μm
Layer Thickness(Z resolution)	10~200μm (25, 50, 100μm recommended)
Support	UNIZ Smart Support Technology
Dimension / Weight /Weight including packaging	380 × 380 × 1230 mm / 60kg / 85kg
Working Temperature	18 ~ 28°C
Power Requirement	110V/60Hz 6A | 220V/50Hz 3A
Z-axis leveling method	Leveling using A4 paper
Connectivity	USB Flash Drive, Wi-Fi, Ethernet
Optical System	4th Generation Collimated Light Source
Control Pannel	7-inch Touchscreen
Product Features	Strong durability Compatible with over 100 types of materials

UNIZ UBEE

Core Features

Liquid Cooling Empowered High Power Photocuring System (LEPH 2.0}

Light Processing Unit 6 (LPU 6)

Smart Sensor & Control System (SSCS)

FSD Module- 4 Z-Axis Force Sensor integrated into the LPU panel

Smart Identification System (SIS}

With NFC and ID Sensing Board Inside

Industrial Robot - KK Linear Module

High-Precision Ball Screw, Servo Motor Control System

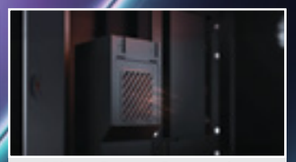
Description	Specification
SMA Printing Speed	50μm – 1hour | 100μm –30minutes
Printing Technology	Masked Stereolithography(MSLA)
Build Volume	198 × 124 × 180mm
XY Resolution	34μm
Layer Thickness(Z resolution)	10~200μm (25, 50, 100μm recommended)
Support	UNIZ Smart Support Technology
Dimension / Weight /Weight including packaging	383 × 425 × 712 mm / 34kg / 56kg
Working Temperature	18 ~ 28°C
Power Requirement	110V/60Hz 6A | 220V/50Hz 3A
Z-axis leveling method	Leveling using built-in sensors
Connectivity	USB Flash Drive, Wi-Fi, Ethernet
Optical System	5th Generation Collimated Light Source
Control Pannel	7-inch Touchscreen
Product Features	Excellent performance in terms of high resolution and precision High Performance and Cost Efficiency

AccuFab CEL

Core Features

High Efficiency Liquid Cooling

Maintains system temperature below 40°C



Micro-Stereo Composite

Patent low force peel technology

High Power Collimated Light

16mW/cm2 high power, 95% Uniformity

Resin Temperature Control System

Maintain optimal reaction Temp

Description	Specification
SMA Printing Speed	50μm – 1hour 20minutes | 100μm – 45minutes
Printing Technology	Light Board Uniformity with High Accuracy
Build Volume	194 × 120 × 180mm
XY Resolution	35μm
Layer Thickness(Z resolution)	50~100μm
Support	Professional Slicing Software
Dimension / Weight /Weight including packaging	360 × 360 × 530mm/ 19kg / 30kg
Working Temperature	20 °C ~ 35 °C
Power Requirement	110 V ~ 240 V / 360 W
Z-axis leveling method	Leveling using custom paper
Connectivity	USB, Wi-Fi, Ethernet
Optical System	Parallel light (resclution 5760 × 3600)
Control Pannel	5-inch Touchscreen
Product Features	Using a ceramic platform for precision printing and excellent biocompatibility Three types of resin tanks available for different purposes

Tera Harz Spinner

Centrifuge

- Fast & efficient resin removal
- Powerful and noiseless spin
- Strong and practical design

Description	Specification
Size	390 × 450 × 430(Wdh) (mm)
weight	6.5kg
capacity	max. 16 aligners
time	spinning time adjustable (5 minutes for aligners)
functions	Digital display | Internal heating during operation | Safety Stops | Simple and efficient maintenance

Tera Harz Care

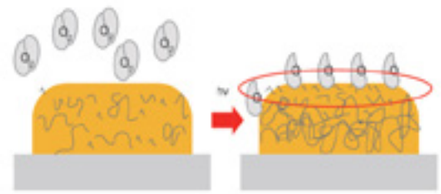
Ultrasonic Cleaner & Warmer

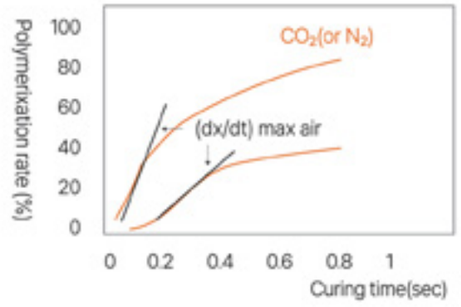
- Takes care of the hygiene of Shape Memory Aligner®s as well as its comfortable wearing and removing
- Easy operation
- Portable size

Description	Specification
Size	Φ115 x 103H
weight	325g
capacity	200ml
Maximum temperature	50°C
Time	5minutes (Auto power off)
functions	Ultrasonic | warmer + Ultrasonic | Auto power off

Benefits of Nitrogen Curing

- Achieve the best mechanical property strength and optimal color depth
- Improved surface gloss (C&B, Denture, etc.) and quality and conformity of castings in nitrogen curing
- Minimize surface stickiness of printouts
- Minimize water absorption & water solubility by disrupting oxygen bonds during curing





Oxygenation Reactions on Surfaces

- Surface Tack Generation by Oxygen
- UV curing uses radical polymerization resins, and radical polymerization is the generation of radicals by UV irradiation. If radicals combine with atmospheric oxygen before resin bonds, oligomers or monomers may remain on the surface and cause surface tack.
- Minimize water absorption & water solubility by disrupting oxygen bonds during curing

Polymerization Rate Based on Atmosphere

- Increased polymerization rate in C02,N2 atmosphere compared to Air atmosphere

Quoted from "Optimize the UV curing process" Science&Technology,2008

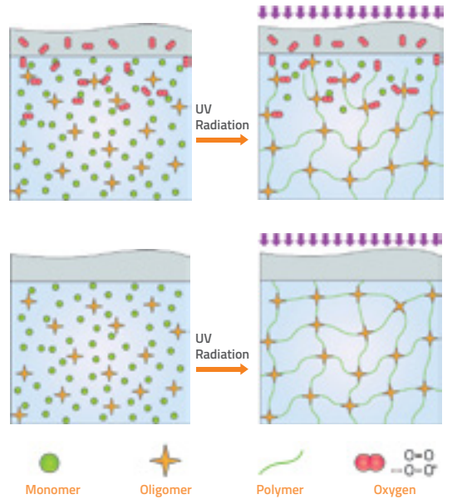
Inhibition of Free Radical Polymerization by Oxygen

Photopolymerization in the presence of atmospheric oxygen

Photocurable resins undergo a radical reaction when exposed to light. In the presence of oxygen, even if radicals are produced, the radicals and oxygen will react with each other. Because oxygen attacks radicals, it inhibits radical polymerization of the monomers and oligomers inside the resin. This mechanism produces an unreacted monomer. This results in a structure with a low cross-linking density. The surface of the cured resin, which has a low surface cross-linking density, can absorb water in a moist environment (oral cavity), resulting in haze and elution of unreacted material.

Photopolymerization in the absence of atmospheric oxygenatmospheric oxygen

The probability of encountering an acyl group increases if the radical has had enough time to stabilize. A cured resin with a strong structure that exhibits high crosslinking density will be stable against moisture. In addition, there is extremely little unreacted monomer and very little risk of exfoliation due to the high crosslinking density.



Mandal, Joydeb, Kaihuan Zhang, and Nicholas D. Spencer. "Oxygen inhibition of free-radical polymerization is the dominant mechanism behind the "mold effect" on hydrogels." Soft Matter 17, no. 26 (2021): 6394-6403.

Tera Harz Cure

3rd Generation Nitrogen Curing Machine

World's first UV curing device to achieve 100% polymerization conversion of materials

- 280,000Mj/cm2,1,000MW/cm2(5 minute-curing based), the best material intensity and shade with high intensity UV energy Ability to store 5 curing conditions per material
- The optimal light level for each printed materials(Level 1-5) 360° UV irradiation and optimal LED arrangement for best light uniformity
- Safety cooling system based on LED temperature Maximum curing size(180mm,360 Turntable)

Benefits of Nitrogen Curing

Able to obtain the best mechanical properties and optimal shading Minimize oxygen to improve surface quality for C&B, denture fabrications, etc. Perfect final metal crown alignment by improving casting surface quality Nitrogen curing is mandatory for dental and medical field products (for surface tacky and residual polymer removal) Improved economic efficiency and convenience compared to existing nitrogen curing machines connected to a nitrogen tank.

Nitrogen Generation

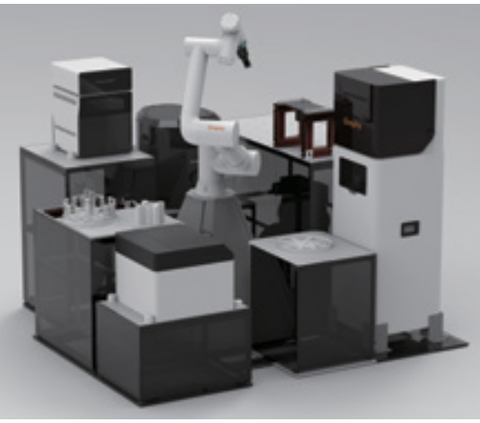
Minimize Oxygen in the Chamber (artificial image)

Properties	Description
Display	7.9" TFT Touch LCD
LED Wavelength	405nm
LED Power	200W
Curing Chamber	Ø180 × 650mm
Dimension (weight)	275 × 310 × 310mm (8.5kg)
UV Energy Density Irradiance of UV (5 minute-curing based)	280,000 mJ/cm2 1,000 mW/cm2

UV Energy density Irradiance of UV Light (UV Meter LS128 / 5 minutes)	180,000 mJ/cm²	205,000 mJ/cm²	230,000 mJ/cm²	255,000 mJ/cm²	280,000 mJ/cm²
	600 mW/cm² (Lv.1)	700 mW/cm² (Lv.2)	800 mW/cm² (Lv.3)	900 mW/cm² (Lv.4)	1,000 mW/cm² (Lv.5)

Tera Harz Smart Robot

The most advanced integrated device for Shape Memory Aligner manufacturing.



Advantages of Tera Harz Smart Robot

This system is more than just a system. The excellence of the world's first Shape Memory Aligner is more elaborated, possible by introducing a state-of-the-art robot-system for greater excellence and convenience. Shape Memory Aligner is made more efficient with the solution of Graphy's new Tera Harz Smart Robot.

1 Competitive excellency in technology

Deliver consistent quality of product, 24hr operation time and optimized automated reprogramming.

2 Improvement outcomes

Improve the quality of the outcome through sophisticated operation.

3 Economic benefits

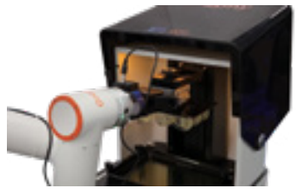
Reduce consumables, accelerate the treatment and enhance productivity.

4 Time efficiency

Same day and convenient treatment.

Description	Specification
Product Name	Tera Harz Smart Robot (THSR)
Model Name	R2K2U
Weight(Kg)	20
Application	In-house Aligner Manufacturing (lab/clinic)
Voltage	220V(110V Compatible Module Provided)
Usage	Production Line
After Warranty Service	Video Technical Support
Type	6-axis Vertical Multi-joint
Machine type	Aligner Manufacturing Robot Arm 6 Axis
Aligner Material	Tera Harz Clear
Warranty	1 year

Manufacturing Process of Tera Harz Smart Robot

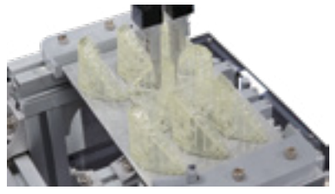


01
Aligner Printing

When the Tera Harz Smart Robot(THSR) picks up the pen and touches the LCD, the print will start.
Once the printing is finished, the printer door will open.

02
Detach the Build Plate

Tera Harz Smart Robot(THSR) loosens the knob that secures the build plate in the printer and removes it.
The build plate is then flipped and mounted onto the alignment disassembly Jig.



03
Remove the Aligner

Use the tip to initially separate the aligner from the support.
After changing the tip, completely detach the initially separated aligner.
Arrange the separated aligners and mount them in order on the Spinner holder.

04
Resin Removal

ift the Spinner holder and mount it onto the Spinner.
After mounting, turn the digital knob of the spinner to start the de-resining process.
Once de-resining is complete, open the door and remove the holder.

05
Curing

Take each aligner from the Spinner holder and mount it onto the curing plate (up to 8 pcs).
Lift the curing plate and position it inside the curing device.
Close the door and press the LCD to start curing.

HISTORY

ABOUT GRAPHY INC

2017

01. **Graphy Inc. was founded.**
06. **Annex Research Institute was established.**
09. **Certified as Venture Company**
11. Factory was registered.

2018

01. Patent of [Digital Castings Using 3D Data] was registered.
04. [Technology Evaluation Outstanding Company T-5 Certification] was granted for the technology of [Modifying casts and splints with 3D data].
09. [Technology Evaluation Outstanding Company T-5 Certification] was granted for the techniques for developing 3D cast fabrication solutions.

    Won the grand prize in the preliminary round of the [Challenge K-Startup Innovation League].

2019

02. **Signed an agreement with JW Holdings Healthcare to jointly develop new materials.**
04. 3D Printing Material (Tera Harz) Development Technology
05. [Technology Evaluation Outstanding Company T-4] certified Cast and Splint Manufacturing with 3D Data
12. **Selected as an outstanding invention for UV post-curing by the Korea Invention Promotion Association**

    Received the Minister of SMEs and Startups Award and the Korea Information and Communication Technology Agency Award

    ISO 13485 Quality Management System Certified

2020

01. Light-curable polymer compositions for 3D printers were patented.
02. World's First Dentistry to have dental crown resin for 3D printing.
04. Acquired certification of the resin used for orthodontic appliances (CE Class2, FDA)
05. Credit Guarantee Fund from First Penguin Startup Selectio was granted.
07. Expanded through Graphy's own agencies in over 10 countries.
11. Selected as Material parts equipment startups 100
    Establishment of Graphy corporate research center in Ulsan
12. THD MFDS medical device manufacturing certification level 2 obtained

2021

02. Established a subsidiary [Digital Graphy]
06. Certified as Technology Innovation Small Business (INNO-BIZ)

    Designated as an Export-Promising SME
07. Acquisition of CE Class I for Photopolymerizable dental resins (THD & TFDH)
09. FDA 510K acquisition for Dental Crown Resin(TC-80DP)
11. Supply agreement with Henry Schein, the world's #1 dental company
12. 3D Printing Competition Award of Excellence and Information and Communication Industry Promotion Agency Award

    Acquisition of New Excellent Product certification for Orthodontic 3D printing resin with UV-curable polyurethane acrylate

2022

07. **Obtained MFDS medical device certification for TFDH(Flexible Denture) MFDS**

    The patent for "3D printable light-curable compositions for manufacturing transparent aligners" was registered in USA.
08. Acquisition of FDA510K for TFDH (Flexible Denture)
11. **Acquisition of FDA510K for Tera Harz Clear as a resin for orthodontic aligners**

    Resin for orthodontic aligners, selected as World's Next Greatest Product 2022

    Minister of Science, ICT and Future Planning Award granted

2023

03. Held Graphy Shape Memory Aligner Symposium
04. Participated in AAO signed multiple global scale supply contracts

    Appointed for national projects totaling 4 million USD
06. Recognized as a [Technology Growth Excellent Company TI-2] by Korea Rating & Data for development and manufacturing technology of shape memory aligner using UV curable 3D printing resin
11. BR-23 Obtained FDA 510k (Class II) for BR-23
12. Awarded "Tower of Export: 3 million USD" at the Day of Trading

    Awarded as one of "Outstanding Export Companies" at Hi Seoul Enterprise Festival by mayor of Seoul

    Awarded as an Industrial Technology Development Merit Organization for new technology utilization development by Prime Minister

    Awarded by Minister of Industry, Trade and Resources for "Contribution to Development of Convergence Manufacturing Industry"

    Awarded "Future Creative Enterprise Management Award" & "Minister of Employment and Labor Award" (Sponsored by the Ministry of Science and ICT, Ministry of Employment and Labor, hosted by Money Today)

    1st place in the Outstanding Brand of the Year (sponsored by JoongAng Ilbo)

2024

01. Tera Harz Clear (TC-85DAC) / Certified by Japan's PMDA (Pharmaceuticals and Medical Devices Agency)
02. 3D Printing Resin for Orthodontic Devices / Recipient of the IR52 Jang Young Sil Award
03. Tera Harz Clear (TA-28, TR-07) / Obtained FDA 510(k) Clearance

    Selected for the 2024 Ministry of Trade, Industry, and Energy Export Voucher Program
04. Recognized as a globally competitive small enterprise (Top 1,000 Companies Worldwide)
05. Selected for the 2024 AI Voucher Support Program

    Tera Harz Clear (TA-28, TR-07) / Certified by Korea's MFDS (Ministry of Food and Drug Safety)
07. Tera Harz Clear (TC-85DAC) and Tera Harz (TC-80DP, BR-23) / Registered with ARTG (Australian Register of Therapeutic Goods)
08. Tera Harz Clear (TC-85DAC) and Tera Harz (TC-80DP, BR-23) / Registered with Taiwan's TFDA (Taiwan Food and Drug Administration)

    Selected as a 2024 Seoul Innovative Small Enterprise

    Achieved an "A" grade in technical evaluations conducted by two specialized assessment bodies of the Korea Exchange
09. Tera Harz Clear (TA-28, TR-07) / Certified by Japan's PMDA

Graphy

3D Print the World with Graphy's Solutions

3D Print the World with Graphy's Solutions