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PRODUCT OVERVIEW 3D PRINTING MATERIALS

FREEPRINT® ortho

Drilling templates Orthodontic base components









Splints



FREEPRINT® temp

Temporary crowns & bridges Anterior and posterior tooth restorations



FREEPRINT® denture

Removable denture bases Total prosthesis





FREEPRINT® tray

Individual impression trays Functional trays Base resin plates





FREEPRINT® tray

DETAX.

FREEPRINT

model KFO

DETAX.



Transfer trav Bracket positioning Indirect Bonding Tray





DETAX

FREEPRINT® model

Model production Working models Situation models Control models





FREEPRINT®

temp

DETAX

FREEPRINT

model

DETAX.

FREEPRINT

gingiva

DETAX.



FREEPRINT® model 2.0

Model production Master models Working models Control models







FREEPRINT® model KFO

Model production Orthodontic models





Model production thermoforming technique





FREEPRINT® gingiva

Gingival masks



FREEPRINT® cast 2.0









MATRIX FREEPRINT®

MEDICAL RESINS

Material ty	pe	Application	Colour / Appearance	Medical devices Class	Characteristics	385 nm	405 nm
temp		temporary crowns & bridges, anterior and posterior tooth restorations	A1, A2, A3	lla biocompatible	natural transparency and tooth esthetics, extremely high construction precision & mechanical stability	√	-
denture		removable denture bases, Total prosthesis	pink-transparent	lla biocompatible	long-term stability and biocompatible dentures, fast printing time, perfect fit	1	-
ortho		drilling templates for implant dentistry, orthodontic base components	clear-transparent	lla biocompatible	very high mechanical stability & construction precision, high printing speed, sterilizable	√	✓
splint 2.0	No.	splints	clear-transparent	lla biocompatible	high mechanical flexural strength and stability, high initial final hardness	1	-
tray		individual impression and functional trays, base resin plates	green	l biocompatible	high dimensional stability, torsional rigidity, max. construction speed, compatible with all impression materials	✓	/
IBT		orthodontic transfer trays for positioning brackets	transparent	l biocompatible	elastic and tear-resistant, secure and precise fixing of brackets, tasteless	✓	-

TEC RESINS

	Material type	Application	Colour / Appearance	Medical devices Class	Characteristics	385 nm	405 nm
model	A STATE OF THE PARTY OF THE PAR	working, situation and control models	grey ivory sand	-	maximum surface hardness and dimensional stability, pleasant haptic, very good construction precision	1	1
model 2.0	Seption 1	master, working and situation models	white sand caramel light grey grey	-	high detail reproduction, max. surface hardness & and dimensional stability, plasterlike appearance & haptic, very good construction precision	1	-
model KFO	No.	model production, orthodontic models	white	-	plasterlike haptic, distinctive edge and dimension stability, highest surface quality	✓	-
model T		working models for thermoforming technique	light blue	-	high temperature resistance to process-related temperature stress, high edge strength	1	✓
gingiva		flexible gingival masks for dental 3D models	gingiva	-	3D reproduction of functional gingival model segments, excellent elasticity and tear-resistance, natural colour	✓	-
cast 2.0	C	dental casting objects for precision casting	red-transparent	-	residue-free burning out, high dimensional stability after printing, precise and distortion-free results, even for delicate constructions	✓	-

FREEPRINT® ortho

Drilling templates, autoclavable Orthodontic base components









MED RESIN

biocompatible Medical Product Class Ila

low material consumption high mechanical stability & detail reproduction high building speed sterilizable MMA free

 03989
 FREEPRINT® ortho 385
 1.000 g

 03988
 FREEPRINT® ortho 405
 1.000 g

Light-curing, biocompatible resin (wavelength 385 nm/405 nm) for the 3D printing of base parts for orthodontic appliances, drilling and X-ray templates. Precise positioning and fixation of drill sleeves allow secure patient insertion. Clear formulation for visual control in the working area. Breaking strength, elasticity and influence of moisture following the orthodontic standard. Validated processes for sterilization in autoclaves. Resistant to oral conditions, neutral odour and taste. Colour: clear-transparent

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 20795-2*	MPa	> 75
Flexural modulus	DIN EN ISO 20795-2*	MPa	> 1650
Water sorption	DIN EN ISO 20795-2*	μg/mm³	< 32
Water solubility	DIN EN ISO 20795-2*	μg/mm³	< 5
Hardness		Shore D	> 82
Biocompatibility	DIN EN ISO 10993-1**		complies

^{*} Dentistry - Part 2: Orthodontic base polymers (in accordance with the norm at room temperature)

^{**} Biological evaluation of medical devices – Part 1: Evaluation and testing within a risk management process

FREEPRINT® splint 2.0

Splints



385 nm

MED RESIN

biocompatible Medical Product Class IIa

max building speed high initial & final hardness highest bending & breaking strength non-brittle high fracture toughness MMA free

02076 FREEPRINT® splint 2.0 385 1.000 g





Light-curing, biocompatible resin (wavelength 385 nm) for the 3D printing of splints, fixation and transfer keys. Highest mechanical bending and breaking strength, without being brittle. Process reliability through high initial hardness and final strength. Shortened work flow, no drying process. Low-viscosity approach for reduced loss of material and fast cleaning. Easy to polish, colour-free for appealing esthetics. Resistant to oral conditions. Neutral odour and taste. Colour: clear-transparent

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 20795-2*	MPa	> 80
Flexural modulus	DIN EN ISO 20795-2*	MPa	> 2000
Water sorption	DIN EN ISO 20795-2*	μg/mm³	< 32
Water solubility	DIN EN ISO 20795-2*	μg/mm³	< 5
Hardness		Shore D	> 82
Biocompatibility	DIN EN ISO 10993-1**		complies

^{*} Dentistry - Part 2: Orthodontic base polymers (in accordance with the norm at room temperature)

^{**} Biological evaluation of medical devices – Part 1: Evaluation and testing within a risk management process

FREEPRINT® temp

Temporary crowns & bridges Anterior and posterior tooth restorations









MED RESIN

biocompatible Medical Product Class IIa

low viscosity
max building speed
high abrasion resistance
breaking and flexural resistant
natural tooth esthetics

04058	FREEPRINT® temp 385 A1	500 g
04059	FREEPRINT® temp 385 A2	500 g
04060	FREEPRINT® temp 385 A3	500 g
04062	FREEPRINT® temp 385 A1	1.000 g
04063	FREEPRINT® temp 385 A2	1.000 g
04064	FREEPRINT® temp 385 A3	1.000 g

Light-curing, biocompatible resin (wavelength 385 nm) for the 3D printing of temporary crowns & bridges. Exceptional breaking and flexural resistance, high abrasion resistance. Natural tooth esthetics, brilliant translucent colours. Easy surface processing and polishing, can be characterized individually with the smartrepair® system or composites. Low viscosity for reduced loss of material and fast cleaning. Shortened post-processing as drying time is omitted. Resistant to oral conditions, no odour or taste irritations, colours: A1, A2, A3

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 10477*	MPa	> 100
Flexural modulus	DIN EN ISO 10477*	MPa	> 2300
Water sorption	DIN EN ISO 10477*	μg/mm³	< 40
Water solubility	DIN EN ISO 10477*	μg/mm³	< 7,5
Hardness		Barcol	> 40
Biocompatibility	DIN EN ISO 10993-1**		complies

^{*} Dentistry - Polymer-based crown and bridge materials (in accordance with the norm at room temperature)

^{**} Biological evaluation of medical devices – Part 1: Evaluation and testing within a risk management process

FREEPRINT® denture

Removable denture bases Total prosthesis









biocompatible Medical Product Class IIa low viscosity fast printing time perfect fit permanently stable

MMA-free

02040 FREEPRINT® denture 385 1.000 g

Light-curing, biocompatible resin (wavelength 385 nm) for the 3D printing of removable denture bases, total prosthesis. High process reliability due to high initial hardness after printing. Low viscosity for reduced material consumption and faster cleaning. Shortened work flow, no drying process. Displays maximum mechanical flexural and tensile strength without becoming brittle. Easy to process and polish thanks to smooth printing surfaces. Long term stability and colour stability, odor-less and tasteless. Resistant to oral conditions. MMA-free. Colour: pink-transparent

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 20795-1*	MPa	> 105
Flexural modulus	DIN EN ISO 20795-1*	MPa	> 2500
Water sorption	DIN EN ISO 20795-1*	μg/mm³	< 32
Water solubility	DIN EN ISO 20795-1*	μg/mm³	< 1,6
Hardness		Shore D	>83
Biocompatibility	DIN EN ISO 10993-1**		complies

^{*} Dentistry - Part 1: Denture base polymers (in accordance with the norm at room temperature)

^{**} Biological evaluation of medical devices – Part 1: Evaluation and testing within a risk management process

FREEPRINT® tray

Individual impression and functional trays Base resin plates





MED RESIN

biocompatible Medical Product Class I

low viscosity fast printing time torsional rigidity high dimensional stability MMA free

04086	FREEPRINT® tray 385	1.000 g
02700	FREEPRINT® tray 405	1.000 g

Light-curing, biocompatible resin (wavelength 385 nm/405 nm) for the 3D printing of individual impressions and functional trays, base resin plates. Low viscosity for reduced loss of material and fast cleaning and shortened post-processing. Maximum building speed, very high dimensional stability and torsional rigidity. No mechanical reprocessing of the surface necessary. Suitable for all tray adhesives and impression materials, neutral odour and taste. Colour: green

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 178*	MPa	> 90
Flexural modulus	DIN EN ISO 178*	MPa	> 1900
Hardness		Shore D	> 84
Biocompatibility	DIN EN ISO 10993-1**		complies

^{*} Plastics - Determination of flexural properties (in accordance with the norm at room temperature)

^{**} Biological evaluation of medical devices – Part 1: Evaluation and testing within a risk management process

FREEPRINT® IBT

Transfer tray
Bracket positioning
Indirect bonding tray







MED RESIN

biocompatible Medical Product Class I

low viscosity flexible extremely tear-resistant

04249 FREEPRINT® IBT 385

1.000 g

Light-curing, biocompatible resin (wavelength 385 nm) for the 3D printing of flexible orthodontic transfer trays for positioning brackets. Secure and precise positioning of brackets is possible thanks to indirect bonding. The indirect bracket transfer trays are transparent and facilitate precise positioning. High tensile strength and flexibility allow the easy positioning and removal of brackets in one working step. Odorless and tasteless. Colour: transparent

Property	Standard	Unit measurement	Result
Hardness		Shore A	> 90
Tensile strength	DIN EN ISO 527-1*	MPa	> 8
Elongation	DIN EN ISO 527-1*		> 60 %
Tear strength	DIN ISO 34-1**	N/mm	> 35
Biocompatibility	DIN EN ISO 10993-1***		complies

^{*} Plastics: Determination of flexural properties (in accordance with the norm at room temperature)

^{**} Rubber, vulcanized or thermoplastic: Determination of tear strength (in accordance with the norm at room temperature)

^{***} Biological evaluation of medical devices – Part 1: Evaluation and testing within a risk management process

FREEPRINT® model

Model production Working models Situation models Control models









TEC RESIN

low viscosity
max building speed
max surface hardness
highest construction precision
dimensional stable
pleasant tactility
MMA free

03780	FREEPRINT® model 385 ivory	1.000 g
03778	FREEPRINT® model 385 sand	1.000 g
03782	FREEPRINT® model 385 grey	1.000 g
03779	FREEPRINT® model 405 ivory	1.000 g
03065	FREEPRINT® model 405 sand	1.000 g
03781	FREEPRINT® model 405 grey	1.000 g

Light-curing resin (wavelength 385 nm/405 nm) for the 3D printing of working models. Precise reproduction of details, maximum surface hardness and shape stability. Maximum precision in construction, feel and stability meet the high demands of model production. High mechanical stability secures the functionality and strength of the models. Opaque colour adjustment for the optical detection of surface structure, preparation margins, etc. Colours: ivory, sand, grey

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 178*	MPa	> 70
Flexural modulus	DIN EN ISO 178*	MPa	> 1500
Hardness		Shore D	> 80

^{*} Plastics: Determination of flexural properties (in accordance with the norm at room temperature)

FREEPRINT® model 2.0

Model production Master models Working models Control models Orthodontic models







TEC RESIN

low viscosity
max building speed
highest construction precision
shortened post-processing
max surface hardness
dimensional stable
plasterlike appearance and feel
MMA free

02850	FREEPRINT®	model	2.0	385	caramel	1.000 g
02128	FREEPRINT®	model	2.0	385	sand	1.000 g
02177	FREEPRINT®	model	2.0	385	grey	1.000 g
02099	FREEPRINT®	model	2.0	385	light grey	1.000 g
02148	FREEPRINT®	model	2.0	385	white	1.000 g

Light-curing resin (wavelength 385 nm) for the 3D printing of dental models, master, situation and orthodontic models. Maximum surface hardness and shape stability allow a very high mechanical loading capacity. Faster workflow without drying process. Maximum precision in construction, feel and stability meet the high demands of model production. Distinctive edge strength and abrasion resistance are comparable with conventional plaster models. Precise, smooth and pore-free model surfaces suit high functional demands. Moisture stable and easy to clean. Optimum edge strength provides reliable models. Opaque colour adjustment for the optical detection of surface structure, preparation margins, etc. Colours: caramel, sand, grey, light grey, white

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 178*	MPa	> 80
Flexural modulus	DIN EN ISO 178*	MPa	> 1700
Hardness		Shore D	> 80

^{*} Plastics: Determination of flexural properties (in accordance with the norm at room temperature)

FREEPRINT® model T

Model production Thermoforming technique







TEC RESIN

high temperature resistant max edge stability high construction precision low viscosity precise detail reproduction

 02332
 FREEPRINT® model T 385
 1.000 g

 02322
 FREEPRINT® model T 405
 1.000 g

Light-curing, temperature-resistant resin (wavelength 385 nm/405 nm) for the 3D printing of dental models for the thermoforming technique. Precise reproduction of details, maximum surface hardness and edge stability of the models. The stability of the model remains even under the influence of heat during thermoforming process. Precision in construction, tactility and stability meet the high demands of model fabrication. The pronounced intrinsic stability also allows the fabrication of hollow master models. Low viscosity for considerably easier cleaning and lower material consumption. Colour: light blue

Property	perty Standard		Result
Working temperature for thermoforming foils		°C	≤ 195
Flexural strength	DIN EN ISO 178*	MPa	> 80
Flexural modulus	DIN EN ISO 178*	MPa	> 1700
Hardness		Shore D	> 83

^{*} Plastics: Determination of flexural properties (in accordance with the norm at room temperature)

FREEPRINT® gingiva

Gingival masks



TEC RESIN

reproduction of functional 3D gingival-model segments very elastic and tear-resistant dimensional stability no shrinkage or aging ductile also in case of prolonged storage no bothering or unpleasant odors natural gingiva esthetic



Light-curing resin (wavelength 385 nm) for the 3D printing of flexible gingival masks for dental models. For 3D reproduction of functional gingival model segments in a digital workflow in conjunction with FREEPRINT® model. High elasticity and tear-resistance. Excellent dimensional stability, no shrinkage or aging, ductile even when stored over a long period. No annoying or unpleasant odors from fabricated gingival masks. Colour: gingiva

Property	Standard	Unit measurement	Result
Tensile strength	DIN EN ISO 527-1*	MPa	> 3
Tensile strain	DIN EN ISO 527-1*		> 90 %
Final Hardness		Shore A	> 70

^{*}Plastics: Determination of tensile properties (in accordance with the norm at room temperature)

FREEPRINT® cast 2.0

Casting objects









TEC RESIN

residue-free burning out high dimensional stability after printing distortion-free & precise, also in case of delicate constructions high grade & accurate casting results

 02548
 FREEPRINT® cast 2.0 385
 500 g

 02632
 FREEPRINT® cast 2.0 385
 1.000 g

Light-curing resin (wavelength 385 nm) for the 3D printing of high precision casting objects. Excellent dimensional stability after printing ensures safe application with fit check, in particular where cast models and molds are concerned. Printing results are precise and without any distortions, even for extremely delicate and intricate models. Any corrections or repairs after printing are possible with "easyform gel LC". Low viscosity and optimized depth of cure enable to reduce printing time and material consumption and facilitate faster cleaning. Burns without leaving any residues in the mold and is the basis for high-grade modeling results that ensure the perfect fit. Phosphate-bonded investment materials are used as investments. Colour: red-transparent

Property	Standard	Unit measurement	Result
Flexural strength	DIN EN ISO 178*	MPa	> 70
Flexural modulus	DIN EN ISO 178*	MPa	> 1700
Heating temperature			1 h @ 800 °C
Cauterisation residual	ash content		< 0,1%

^{*} Plastics: Determination of flexural properties (in accordance with the norm at room temperature)

PROCESS VALIDATION

MEDICAL RESINS

				L INLOINO			
<u>-</u>	tion done tion in process						
	FREEPRINT®	temp	denture	ortho	splint 2.0	IBT	tray
	ASIGA MAX MAX / MINI	✓	✓	✓	✓	✓	✓
	ASIGA PICO2	✓	✓	✓	✓	✓	>
	ASIGA PRO2	✓	✓	✓	\	√	1
	ASIGA PRO	✓	C	✓	Q	O	✓
	MICROLAY	©	©	C	0	O	Ø
	MIICRAFT 125 Y	✓	✓	✓	✓ 	©	1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	RAPID SHAPE D2011 / D3011 / D4011	✓	✓	✓	✓	Q	1
	RAPID SHAPE D90II	✓	O	✓	O	©	1
O Compto	W2P	✓	✓	✓	✓	O	/

TEC RESINS

		LO RESIN		W. C.
model	model 2.0	model T	gingiva	cast 2.0
✓	✓	✓	✓	/
\	>	>	✓	✓ /
✓	>	>	✓	✓ <u> </u>
✓	0	✓	0	✓ <u> </u>
✓	0	✓	0	✓
✓	>	✓	0	✓
✓	✓	/	Ø	/
✓	Ø	√	Ø	✓ <u> </u>
✓	/	✓	Ø	✓ <u> </u>







CERTIFIED · VALIDATED · RELIABLE

Generative manufacture of medical devices has increased not only the importance of the materials themselves, but also the demands on their properties. Highly differentiated material properties enable ever new applications for dental 3D printing.

Only the combination of high-performance resins with scientifically based expert knowledge from all areas of the digital workflow leads to cumulated expertise, to truly innovative products, and thus to an **unlimited choice of materials**. FREEPRINT® materials are validated for all standard DLP printers. Our validation portfolio is continuously being expanded with new materials and qualified printers. To this end, our experts check and document complete process sequences in accordance with the relevant standards and regulatory requirements. This ensures permanently reproducible results and constant product quality.

Digital Workflow requires profound material competence and a close cooperation with the technology partners in order to perfectly match individual elements of the process chain. For transparency and process reliability, all FREEPRINT® instructions for use comprise an overview of validated printers, certified finishing equipment (post-exposure, cleaning, etc.) and detailed flowcharts of the manufacturing process.

Our expert team will support you with useful tips.

3Dapplication@detax.de support@detax.de

3D WORKFLOW





Digitization of the patient's initial situation is the basis for the digital manufacturing process. It is done using an intraoral scanner, or by scanning the model. Using the data thus generated, a three-dimensional surface structure is generated – mostly in the form of an STL file –, which can then be transferred to a design software.



MODELLING

Highly automated CAD programs are used for the planning and construction of the objects to be printed. Interfaces for 3D X-ray or DVT X-ray data allow, for example, the planning of implants and the design of drilling templates. Software solutions provide a cross-platform workflow for dental laboratories, dentists, implantologists and surgeons.



CREATE SUPPORT

Support structures are required for sensitive areas in order to physically implement the component by 3D printing. Special tools are available to this end; all you still have to do is to select the appropriate style. The support software is already integrated in many printers. Certified processes between DETAX and the printer manufacturers ensure validated printing processes.



SLICING

After completion of the design (CAD), the slicer prepares the objects for printing. The slicing process creates the individual layers to be exposed. The slicer software serves as an intermediary between the 3D model and the 3D printer.



PRINTING

For a precise print job, the parameters of the corresponding material stored in the printer are necessary. These data are used not only to control the exposure process for the material, but also to determine the corresponding movement mechanics of the printers. Coordination of these processes is the prerequisite for successful DLP printing of challenging structures.



CLEANING

After printing, the non-polymerized material on the surface must be removed so as to leave no residue before the final post-exposure. Drain the component off in the printer, then carry out a 2-stage secondary cleaning with isopropanol in an ultrasonic device. Cleaning can also be carried out in suitable separate devices.



CURING

The properties of the final product depend, among other things, on the finishing process. Correct post-exposure is very important for biocompatibility. To ensure that the printed structures are fully cured, post-exposure in devices with LED lamps or xenon flashlight in an inert gas atmosphere is recommended.



FINISHING

Finally, the surface is finished as required, e.g. mechanically polished. Perfect fit, optimal product properties and reliable reproduction are the results of a validated and certified process.

GOOD TO KNOW...



BOTTLE ROLLER

By using a bottle roller optimal mixing of the material will be achieved and the printer can be refilled at any time without bubble formation in the material.



POST-CURING UNIT

The post-curing unit recommended in the instructions for use guarantees optimal core and surface curing and thus a biocompatible final product and ensures high shade brilliance & transparency without discolorations.



CLEANING

The best cleaning results for the construction job are achieved when the pre-cleaning and post-cleaning are carried out in separate containers in the ultrasonic device. After cleaning with isopropyl alcohol, it is recommended to clean the drill holes/openings with compressed air.



CLEANING TRAY

The tray can be very easily cleaned after light soiling by briefly illuminating the entire projector surface (for most printers using the "Show white" image display). All contamination can then be simply removed by stripping off the cured layer.



BUILDING SPEED

The building speed depends likewise on the material, the motion parameters and the light intensity of the 3D printer! All FREEPRINT® materials are characterized by high speed of construction combined with maximum precision.



MDR READY?

The new MDR is a major challenge for the entire sector. Our experts in the QM, Regulatory Affairs and Software & Process Validation areas are happy to answer your questions.



LIVE CHAT

The Detax Live Chat – immediate and personalized assistance in real time – provides expert support for technical questions, e.g. product application, 3D printing, etc. Chat with us and benefit from quick & competent advice!



MORE QUESTIONS?

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support@detax.de service@detax.de

CERTIFICATION

Certified according to the guidelines for medical devices (already since 1996!) as well as current QMS standards. Certification according to Appendix II, Directive 93/42/EEC; DIN EN ISO 13485:2016 (also Taiwan) and MDSAP für Canada, Brazil, Australia, Japan, USA; GOST R for Russia, GOST B for Belarus. The requirements for the biocompatibility of our medical devices are based on ISO 10993-1. The tests required for this standard are performed exclusively in accredited laboratories according to EN ISO/IEC 17025. Registered with the Union Data B for Safety in the Supply Chain (RAKCD) as known consignor since February 2012. All company processes are accompanied by occupational protection management.











 $FREEPRINT^{\circledR}\ temp$





FREEPRINT® cast





FREEPRINT® model T





 $FREEPRINT^{\circledR}\ model$





 $FREEPRINT^{\circledR} \ or tho$





FREEPRINT® tray







