

Graphy



Tera Harz TC-85

The world's first Direct Print Aligner material

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GERMAN PRECISION IN ORTHODONTICS

Aligner 4.0

Since the advent of Industry 4.0, many fields have changed drastically with the help of 3D printing technology. The dental sector in particular has been at the forefront of applying new methods and materials to enter the digital era.

Nevertheless, 3D printing has always had and still does have its limitations with regards to the materials and their properties.

The mission of Graphy is to overcome these limitations by developing print resins to meet the requirements of dental and now also orthodontic applications.

Graphy has teamed up with us as international distribution partner to bring this revolutionary new material to orthodontists all over the world.



Tera Harz TC-85

The world's first material for 3D-printed aligners

Imagine you could print aligners straight away instead of having to print models first, only to discard them after thermoforming.

Aligners that are designed right around the teeth rather than just thermoformed over them. Aligners where you have full control over the thickness and therefore the force applied by them.

Imagine an aligner in a material that applies constant but low force and that has unique properties, such as shape memory, making treatment more effective and more comfortable for your patients.

A material which makes the aligner remember the shape it was printed in and which is not gradually deformed when removed from the teeth.

Aligners that simply grab and hold the teeth better than thermoformed aligners and can therefore provide better control of the treatment.

Tera Harz TC-85 can provide all this and more –
it is just the beginning of Aligner 4.0.

Tera Harz TC-85

The new material for direct print aligners

TC-85 is a bio-compatible photopolymer that allows you to print your aligners directly. It is already CE-certified and KFDA-certified and also has FDA approval. The resin is available as TC-85 DAC (Direct Aligner Clear) and TC-85 DAW (Direct Aligner White).

With the Tera Harz TC-85, you can print aligners with the following properties

- A uniform thickness, avoiding the usual uneven thinning effect of a thermoforming foil.
- This uniform thickness in turn provides a constant force level over the whole aligner and also a better fit of the aligner.
- Leading providers of treatment planning software are already working on further features so that direct print aligners can be designed with selective thickness. This way, the force applied to individual teeth can vary and movements can be carried out in an even more targeted and efficient manner.
- A better fit and evenly applied forces make for better grip on the aligner.
- More grip allows more control over the teeth and ultimately a more effective treatment.
- In a suitable software, direct aligners can be designed with auxiliaries such as bite blocks or buttons



The material also has a shape memory. This means that the aligner returns to its original shape after deformation during wearing by warming it in hot water. This effect already starts at body temperature. The aligner's shape memory ensures that the force exerted remains constant over a longer period of time.

This can also have a positive influence on the effectiveness and duration of an aligner treatment. In any case, the wearing comfort for the patient is improved. An aligner made of TC-85 can reduce the sensation of pain during the transition to the next stage of treatment. But that's not all! If the aligner is put in warm water, the material becomes soft and malleable, so that inserting the aligner is as easy as putting on a glove – even with many attachments or severe crowding.

Once in place and cooled down to body temperature, the aligner returns to a harder state and begins to have an effect. Removal of the aligner works just as well, too.

One thing to note: Printing aligners with TC-85 may not save you time or money when compared with thermoformed aligners, but it will enable you to offer state-of-the-art technology in your aligner treatment.

To give you an idea of the cost of a direct print aligner made from TC-85:

A 1 kg bottle of TC-85 equates to 1065 ml.

We assume that approx. 10% waste is produced (excess material adhering to the aligner, residue in the tank, etc.) and that approx. 6 to 7 ml are required per aligner (incl. supports).

This gives an output of approx. 135 to 145 aligners per bottle.

At a recommended retail price of € 480 (excl. VAT.), material costs for one aligner range from € 3.31 to € 3.56 (excl. VAT).

Tera Harz Cure THC2

A special light-curing unit

A special material needs special curing. In order to exploit the full potential of TC-85 in terms of its special properties and to be able to fabricate a flawless product, direct print aligners must be light-cured in a THC2. The THC2 was specifically designed for Tera Harz and is utilizing an adjustable, high-energy LED UV light source and an integrated nitrogen generator. This combination of intensive UV-irradiation under a 95% nitrogen atmosphere ensures that the printed aligners have the desired shape memory properties, are fully transparent and completely safe to use. The nitrogen generator needs (clean, oil-free and dry) compressed air with a mains pressure of at least 7 bar at 100 l/min and a reserve volume of 20 l or more (recommended 8 bar at 115 l/min). The use of the nitrogen generator is optional, meaning the THC2 can also be used for other resins with suitable parameters.



Memory function
(up to 5 modes)



Safety system
(auto power-off)



7.9" touchscreen



Diagnostic function



Light uniformity

Technical data

Tera Harz Cure THC2

TECHNICAL DATA	
Light source	UV LED
Curing time	1–60 min/5–55 sec
Input voltage	100–240 V AC, 50/60 Hz
Output voltage	24 V, 12.5 A
Compressed air supply	7 bar (clean, dry & oil-free)
Display	7.9" TFT touch LCD
LED wavelength	405 nm
LED power output	200 W
UV energy density	280,000 J/cm ²
Irradiance of UV	1000 mW/cm ²
LED operating temperature	5–35 °C
Curing chamber (turntable)	Ø 180 x 65 mm
External dimensions	275x310x310 mm
Weight	8.5 kg



Requirements

to print with Tera Harz TC-85

Printer

Not every resin printer can process Graphy materials. They need an open mode to set the proper parameters or must have these parameters pre-programmed. The wavelength of the light source and many other factors must match the requirements for Tera Harz. Graphy currently recommends the following printers:

- **Uniz SLASH 2/Uniz NBEE**
- **Asiga MAX**

There are more printers approved by Graphy with the right parameter sets.



Using the QR code, you can find the full list of currently validated printers.

and necessities

to print with Tera Harz TC-85

Tera Harz Spinner

Unlike conventional printing resins, Tera Harz TC-85 must not be washed in alcohol, as this would impair the unique properties of the resin. After printing, the aligners are placed in the Tera Harz Spinner, where excess material adhering to the surface is removed by centrifugal forces. The Spinner is an indispensable part of the manufacturing process for aligners printed with TC-85.

TECHNICAL DATA	
Dimensions (mm)	390W x 450D x 430H
Weight	14 kg
Capacity	Max. 16 aligners
Time switch	5 min. automatic shutoff. Adjustable run time
Function	Digital control switch Integrated heating element (runs automatically in operation) Safety stop (10 seconds)
Speed	500 rpm (BLDC motor)
Output	50 W
Voltage	Free voltage 24 V DC, 4 A



Ordering information

Item no.	Contents	Description
415-0001	1	TC-85 DAC (Direct Aligner Clear) 1 kg, bio-compatible photopolymer with shape memory
415-0002	1	TC-85 DAW (Direct Aligner White) 1 kg, bio-compatible photopolymer with shape memory
415-0101	1	Tera Harz Cure THC2 Curing unit with attached nitrogen concentrator
415-0003	1	Tera Harz Spinner Cleaning unit to remove excess resin from printed objects

Ordering information

Item no.	Contents	Description
415-0040	1	S-Plastic S-100 M beige 1 kg resin for model printing, beige
415-0041	1	S-Plastic S-100 M clear 1 kg resin for model printing, clear
415-0042	1	S-Plastic S-100 M grey 1 kg resin for model printing, grey
415-0010	1	Tera Harz TC-80DP crowns & bridges 1 kg resin for printing permanent crowns and bridges
415-0050	1	Tera Harz SG-100 drilling template 1 kg resin for printing drilling templates and surgical templates, clear
415-0051	1	S-Plastic cast model 1 kg resin for printing ashless combustible cast models, green



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