

# Graphy

World's 1st 3D printed direct aligner



## 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 beginning of Industry 4.0 many fields have drastically changed with the help of 3D printing technology. Especially the dental sector has been on the forefront of applying new methods and materials to move on into the digital era.

But 3D printing always had and still has its limitations with regards to printable 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 the orthodontists all over the world.



# Tera Harz TC-85 –

The world's first 3D printing Direct Aligner material

Imagine to print aligners directly instead of printing models first, only to discard them after thermoforming.

An aligner that is designed right around the teeth instead of just thermoformed over them.

Aligners where you have full control over the thickness and therefore the force applied by them.

Think about an aligner made of a material that applies constant, low forces. That has unique properties such as a shape memory that can make the treatment more effective and convenient for your patient.

A material which makes the aligners remember the shape they were printed in and which prevents them from being deformed bit by bit by taking them off the teeth.

Aligners that simply grab and hold the teeth better than a thermoformed aligner and therefore can 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 photoreactive polymer that allows you to print your aligners directly. It is already CE and KFDA certified and also FDA approved.

The resin is available as TC-85 DAC (Direct Aligner Clear) and TC-85 DAW (Direct Aligner White).

## Tera Harz TC-85 will allow you to print aligners

- with a uniform thickness, avoiding the usual thinning of a thermoforming sheet.
- This uniform thickness in turn provides a constant force level over the whole aligner and also a better fit of the aligner afterwards.
- A better fit and evenly applied forces make for a better tracking of the aligner.
- A better tracking allows more control over the teeth and ultimately a more effective treatment.



In addition, the material has a shape memory. This means that after being deformed during wearing time, the aligner can be brought back to the original shape by warming it up in hot water. This effect already starts at body temperature. As a result, the shape memory of the aligner ensures that the force exerted remains constant over a longer period of time.

This can also positively influence the effectiveness and duration of an aligner treatment. For sure it improves the wearing comfort of the aligner for the patient. An aligner made of TC-85 can reduce the pain felt upon moving on to the next stage of the treatment. But there is more! Immersing the aligner in hot water the material becomes soft and formable which makes placement of the aligner as easy as putting on a glove. Even with many attachments or in severe crowding.

Once placed and cooling down to body temperature the aligner returns to a harder state and starts to work. And removal of the aligner works just the same.

Something to point out: Printing aligners with TC-85 will probably neither save you time nor money when comparing to thermoformed aligners but it will enable you to implement latest state of the art technology in your aligner treatment.

## Just to give you an idea of what a TC-85 Direct Print Aligner will cost:

A 1 kg bottle TC-85 equals 1065 ml.

Let us assume we have about 10 % waste (excess material sticking to the printed aligner, remains in the tank, etc.) and we need approx. 7 – 8 ml per aligner (incl. supports).

This gives us an output of about 125 – 130 aligners per bottle.

At a recommended retail price of € 500 (VAT excl.) the individual aligner has material costs of € 3.85 – € 4.00 (VAT excl.).

# Tera Harz Cure THC2 –

## A special light cure unit for a special resin

A special material needs special curing. In order to exploit the full potential of TC-85 in terms of color and physical properties, you need to light-cure the resin in a THC2.

The THC2 was specifically designed for Tera Harz and is utilizing an adjustable, high-energy LED UV light source and a nitrogen concentrator which is incorporated in the system. This combination of intensive UV-irradiation under a 95% nitrogen atmosphere make sure that printed aligners have the desired shape memory properties and that they are absolutely clear.

The nitrogen concentrator requires compressed air (clean, oil free and dry) with a mains pressure of 7 bar. The use of the nitrogen concentrator is optional, so THC2 can also be used for other resins with suitable parameters.



**Memory Function**  
(up to 4 Modes)



**Safety System**  
(Auto Power-Off)



**7.9" Touch Screen**



**Diagnostic Function**



**Light Uniformity**

# Specifications

## Tera Harz Cure THC2

Light Source	UV LED
Curing Time	1 – 60 min / 5 – 55 sec
Input Voltage	100 – 240 VAC, 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 <sup>2</sup>
Irradiance of UV	1,000 mW/cm <sup>2</sup>
LED Operation Temp	5 – 35 °C
Curing Chamber (Turntable)	ø 180 x 65 mm
Outer Dimension	275 x 310 x 310 mm
Weight	8.5 kg



# Requirements and necessities

## to print with Tera Harz TC-85

### Printers

Not every resin printer can handle Graphy materials. They need an open mode to set the proper parameters or must have them on board already. The wavelength of the light source and many more factors must match the requirements for Tera Harz. Graphy currently recommends the following printers:

- **Uniz SLASH 2/Uniz NBEE**
- **Asiga MAX**
- **SprintRay Pro 95 or Pro 55**

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



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

### Centrifuge





Other than with conventional print resins the Tera Harz TC-85 is not washed in alcohol since this would damage the unique properties of it. After printing the aligners are placed in the centrifuge where excess material sticking to the surface is removed by centrifugal forces. The centrifuge is an essential part of the fabrication process of aligners printed in TC-85.

### Specifications

Color	brown / white
Capacity	8 aligners
Power input	220–240 V; 50 / 60 Hz
Outer Dimension	390 x 380 x 590 mm
Weight	2.6 kg



## Order details

Order No.		Description	Quantity
415-0001		<b>TC-85 DAC (Direct Aligner Clear)</b> 1 kg, bio-compatible photoreactive polymere with shape memory	1
415-0002		<b>TC-85 DAW (Direct Aligner White)</b> 1 kg, bio-compatible photoreactive polymere with shape memory	1
415-0101		<b>Tera Harz Cure THC2</b> curing unit with attached nitrogen concentrator	1
415-0102		<b>Centrifuge</b> cleaning unit to remove excess resin from printed objects	1





**Manufacturer:**

Graphy Inc.  
08501 6F, 225  
Gasan digital 1-ro  
Geumcheon-gu, Seoul, Republic of  
Korea

Phone: 82-2-864-3056

Fax: 82-2-864-3057

**Distributed by:**

**FORESTADENT**

Bernhard Förster GmbH  
Westliche Karl-Friedrich-Straße 151  
75172 Pforzheim

Phone: +49 (0) 7231 459-0

Fax: +49 (0) 7231 459-102

[www.forestadent.com](http://www.forestadent.com)

[info@forestadent.com](mailto:info@forestadent.com)

  
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