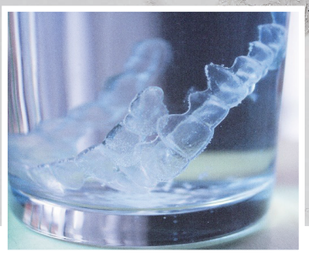
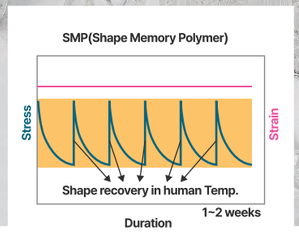
# *Graphy*

World's 1st 3D print the world with graphy's solutions

# Shape Memory Aligner®
## (Tera Harz Clear)






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**

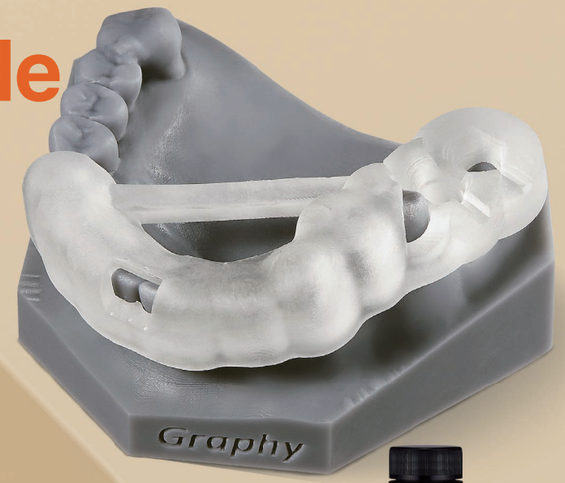
The mechanical properties of the 3D printed Shape Memory Aligner® using the Tera Harz Clear showed no change in properties even one week after the patient wore it.

(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 |



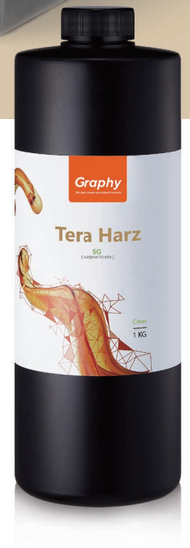
# Surgical Guide
## (SG-100)




This implant surgical guide resin from Graphy allows the surgeon to implement an optimized design exactly as intended for the patient's situation, or the case.

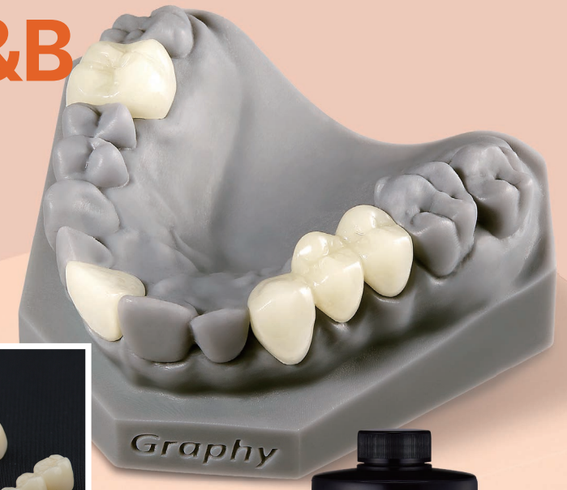
This allows the users to drill at the correct angle and depth. What this surgical guide resin from Graphy more special is that users don't need a drill sleeve because the guide hole is both precise and tight.

With a Heat Distortion Temperature (HDT) of over 130°C, there is no problem with sterilization via autoclave, and the transparency can be adjusted depending on the post-processing method.




| 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 |

# Permanent C&B
## (TC-80DP)



Tera Harz C&B(TC-80DP) is a permanent C&B resin with the world's highest flexural strength (ISO-10477). TC-80DP 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-80DP is an internationally validated 3D 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/B/C/D shade




This is the best material for implant prosthetics or natural tooth prosthetics for bridges of six or more teeth. It was developed to be used as a resin for permanent dental crowns for long bridges, and 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 3D 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 |

# Model
## (S-100M)



One of the earliest and most common 3D printed creations used in dentistry is the dental model.

With the S-100M 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 | Remark |
|---|---|---|---|
| Color | - | Grey·Beige | |
| 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 (D) | - | ≥ 90 | |
| Flexural Strength | MPa | ≥ 110 | ASTM D790 |
| Flexural Modulus | MPa | ≥ 2500 | ASTM D790 |
| Tensile Strength | MPa | ≥ 60 | ASTM D638 |
| Tensile Modulus | MPa | ≥ 2500 | ASTM D638 |
| Elongation | % | ≤ 10 | ASTM D638 |
| Impact strength | J/m² | ≥ 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 3D printers are widely used in the dental field, it is possible to design castings using 3D 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 | |