

G-PRINT 3D Model. This product consists of a resin doped with graphene for the 3D printing of dental models. Dental use.

Please read this instructions sheet carefully before using the product.

1. G-PRINT 3D Model

G-PRINT 3D Model is a light-curing acrylic resin whose main base is a polymer doped with graphene (allotropic form of carbon), suitable for the three-dimensional printing of dental models. The product can be used in DLP/LCD printers with a wavelength of between 385 and 405 nm.

The product is supplied in one format:

- 1 L safety package.

2. Instructions

G-PRINT 3D Model is especially recommended for manufacturing working and reference models in the dental sector.

3. Counterindications

Since the product is not in contact with the patient's tissues, there is no type of counterindication.

4. Risks and safety instructions

This product has been manufactured and tested to the highest quality standards. To ensure optimal further processing of the product, please read the information in these instructions for use carefully.

Improper use and non-compliance with the instructions may impair the product's quality.

The liquid resin and the unpolymerised printed object (objects in "basic state") must be handled in accordance with the safety instructions and precautions in this product's instructions for use.

For specialised persons only.

4.1 Secondary effects and precautions

Prevention/protection

Protective clothing must be worn when handling this product.

Safety goggles and nitrile gloves must be worn.

4.2 General handling instructions

Supply

G-PRINT 3D Model is supplied in opaque closed bottles.

Filled weight

- REF = 1 kg

4.3 Storage

This product must be stored in its original closed bottle at room temperature (approx. 21 °C) in a dark and dry environment.

Ensure that the temperature does not fall below +5 °C and does not exceed +35 °C.

Note: check the printed expiry date. If the product is processed after the expiry date, it is no longer possible to ensure that the processing result is suitable.

While not in use or in storage, unpolymerised printed models (objects in “basic state”) must be stored in a place protected from light, if possible, to avoid any alteration of shape. Fully polymerised printed objects must be stored at room temperature in a place protected from light.

5. Resin parameters

- Hardness: **87 Shore D**
- Viscosity (25 °C): **552 mPa. s**
- Curing wavelength: **405 nm**
- Liquid density: **1.1 m g/cm³**
- Solid density: **1,184 g/cm³**
- Elastic modulus (1): **2,540 MPa**
- Bending resistance (5%) (1): **80.6 MPa**
- Curing time: **1.4 – 4 s**
- Service life: **12 months**

⁽¹⁾ ASTM B 790-15

6. Work with G-PRINT 3D Model

Processing requirements.

6.1 Design

- Create an object (STL data set) with commercial CAD software intended for dental applications.
- For the design, follow the minimum wall thickness requirements for finished restorations.

Note: for hollow printed models, a minimum wall thickness of 2.5 mm must be used.

6.2 Compatible 3D printer

Generally, G-PRINT 3D can be processed on all DLP, LCD 3D printing systems using a wavelength of between 385 and 405 nm.

6.3 Preparation for printing

- Import the STL file.
- Manual/automatic rotation and placement.
- Optimal orientation: horizontal positioning of the print object on the construction platform.
- Manual/automatic generation of support structures.

6.4 Tools, equipment and materials needed for finish

- Stainless steel spatula.
- Cleaning apparatus (e.g., unheated ultrasound bath).
- Cleaning solution (e.g., 96% ethanol solution/99% isopropanol).
- Spray for cleaning solution.
- Spreader disc or side cutting pliers (to remove the support structure).

6.5 Processing

G-PRINT 3D is compatible and can be used with 3D printing system components from various 3D printer suppliers.

Follow the instructions for using the 3D printer to prepare for printing. The ideal temperature for G-PRINT 3D processing is between 18 and 28 °C.

Before use, the resin must be homogeneous. Before the first use, shake the bottle for approx. 2 minutes. When pouring the material, make sure that the exposure time of the impression resin to daylight is kept as short as possible. Mix the resin in the resin tray if there is a transparent layer visible on the surface. For further processing during the printing process (resin selection, material parameters, print job setup), follow the operating printer's instructions.

6.6 Cleaning

Once printing is complete, remove the printed objects from the construction platform using a spatula. The printed object must be cleaned with ethanol (96%) or isopropanol in a cleaning device (e.g. Formlabs Form Wash) or in an ultrasound bath.

Precautionary measures: If ultrasound devices are used, ethanol (96%) or isopropanol must never be filled directly into the ultrasonic bath but must always be added to the recommended container in the water-filled ultrasonic bath. An explosion-proof ultrasonic bath must be used.

Carefully read the information in the apparatus manufacturer's instructions for use.

1. Clean the printed object for 5 minutes in a cleaning fluid in an unheated ultrasonic bath.
2. Then remove the printed object from the cleaning bath and spray it additionally with cleaning fluid to remove the resin residues completely.

Advice: resin residues can be removed equally simply using a cleaning solution.

Precautionary measures: the total duration of cleaning should not exceed 5 minutes, otherwise the quality of the printed objects may deteriorate and cause the object to swell.

After cleaning, dry the printed object with compressed air and suction. If there is still liquid resin adhering to the surface of the object, spray the cleaning solution on the object again and blow it off again to remove it completely.

Preparing for re-hardening

- Start by separating the support structures using a separating disc or side-cutting pliers.
- Hard steel or diamond burs can be used to adapt the model.

Precautionary measures: due to the possibility of dust forming during the milling/finishing of printed objects, a dust mask must also be worn.

Re-hardening process

To achieve the final material properties of the objects made with G-PRINT 3D Model, use a post-cure chamber with the following properties: two xenon strobe lamps, flash frequency 10 Hz, light spectrum 300-700 nm or one xenon strobe lamp, flash frequency 20 Hz, light spectrum 390-540 nm or multi-directional LED with flash power 39 W/9.1 W, light spectrum 405 nm.

Orient/place the models in the appliance with the working surface towards the light source.

To ensure optimal further processing of the product, carefully read the information in the instructions for using the post-curing chambers.

The times indicated are valid only for regularly maintained equipment providing the appropriate light intensity.

Advice for the further processing of printed and light-cured G-PRINT 3D Models.

1. Models can be isolated from plaster adhesion.
2. Models can be duplicated with silicone or duplicating gel.

3. Bushings can be made using an embedded ferrule (Adapta) on the stumps.

4. Only one production of embedded ferrules can be made on the models.

Note: when embedding plastic films, avoid overheating the films.

5. Repair of models printed with G-PRINT 3D Model: models can be repaired with instant glue if the fractured surface is suitable for repair.

Note: in case of defects, cracks or large fractures, it is recommended to manufacture a new model.

To ensure optimal processing of the product, carefully read the information in the instructions for use of the various manufacturers.

6. Cleaning in dental laboratory.

Models made with G-PRINT 3D Model are easy to clean. Steam cleaning, water cleaning and subsequent cleaning with alcohol can be used.

The model can also be cleaned with a toothbrush, running water and soap.

Note: do not pour boiling water (100 °C) onto the model since it could deform.

7. Waste handling










Cured and trimmed material (base plate, support structure) must no longer be used. The cured material can be disposed of with household waste. Unused resin or ethanol (96%) or isopropanol used for cleaning and containing resin residues must be disposed of via the local waste disposal service or at the appropriate collection point for toxic substances, indicating the safety data sheet.

7. Other comments

G-PRINT 3D Model must be used only by dentists, dental technicians and qualified personnel with specific training. Only original tools and parts must be used for processing.

This instruction sheet is based on the current state of the art and our own experience. The product may be used only for the indications described in point 2. The user is solely responsible for the application of the product. As the manufacturer, we are not liable for any faulty results since we are not involved in the processing. Claims for damages and prejudices are limited exclusively to the commercial value of our products.

8. Labelling symbols

 Manufacturer	 See instructions for use
 Manufacturing date	 Expiry date
 Batch	 Warning
 Reference number	 Temperature limit
 Protect from sunlight	

Contact

For questions or incidents with these discs, contact **Graphenano Dental, S.L.**

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