

envisionTEC

Technical Guide

Material Best Practice

E-AquaModel

A high green strength gives E-AquaModel added stability during the printing process, resulting in lower shrinkage and curling than similar products. The low viscosity of the liquid material allows for quick and easy cleanup of the models without the need to use alcohol. This technical guide details the workflow for preparing models for printing in E-AquaModel material, post-processing, and finishing.

Applicable Printers: Envision One cDLM series

Primary Supplies

- Lifestraw Water Filter System, 3.17 gpm, 43 psi
bit.ly/Lifestraw-E-AquaModel
- PCA 4000 curing unit
Order from EnvisionTEC - SAP # ACC-06-1000
- Air compressor
- Cone-shaped paint filter (from Starter Kit)
- Nitrile gloves
- Oscillating shaker
- Paint scraper (from Starter Kit)
- Two plastic containers with lids, 1 qt each
- Paper towels
- Ultrasonic cleaner, 42 kHz operating frequency, 240 watts, 5 liters, heated
- Paint brushes
- Paint scraper (from Starter Kit)
- Plastic funnel
- Rubber spatula (from Starter Kit)
- Snips, X-Acto knife, or similar tool
- Storage container for material - sealable and opaque

Getting Started

1 Capturing patient data

EnvisionTEC printers are compatible with the universal .STL file format and are thus compatible with almost all dental CAD and model design software as well as digital design services. Models may be designed in-house or outsourced to a design partner.

2 Designing models for E-AquaModel

Hollow models are not recommended in E-AquaModel material.

Software

3 Orienting models in Envision One RP software

Spacing: place models a minimum of 2.5 mm apart

Level at build platform: place unsupported models 0 mm from the build platform, 4 mm for models with supports

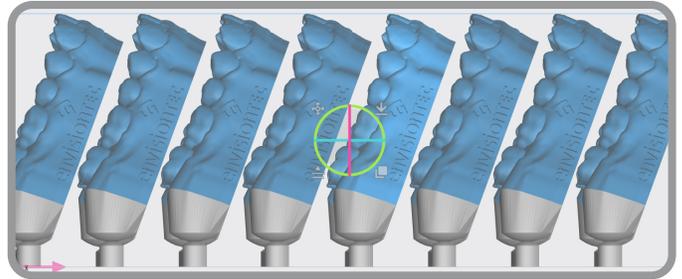
Resolution: 50 μ m and 100 μ m Z resolution

Orient orthodontic models in Envision One RP software with the flat surface facing down, parallel with the build platform. Models that require supports should use the E-Aquamodel.ini support file.

4 Using Hyper Print A-Type Jaws in Envision One RP software

If desired, orthodontic models printed in E-AquaModel material can be printed vertically using the **Hyper Print** feature in Envision One RP, and selecting the option **A-Type Jaws**. A-Type Jaws orients the full platform of models vertically and then tilts each model. Support blocks are added automatically and can be easily removed from the platform after printing due to the specially designed grooves.

Fig. 2 HYPER PRINT A-TYPE JAWS



Print Preparation

5 Mixing the material

E-AquaModel material must be mixed thoroughly before pouring the material into the material tray -

Material in the bottle: Set the sealed material bottle on an oscillating shaker for 10 minutes minimum, or on a bottle roller for 1 hour minimum

Material in the material tray: E-AquaModel material in the material tray can be mixed using the rubber spatula from the Starter Kit

6 Filling the material tray

The material tray should not be filled past the material fill line to prevent overflow when the build platform moves down. To add more material to the printer, carefully pour material into the material tray between print jobs. Adding material while the print is paused, or during a print, will cause a small shift line in the model. See *the Envision One Start Guide for more information*.

7 Printing with E-AquaModel material

Mix material in the material tray gently with the rubber spatula from the Starter Kit before each print. After mixing or adding material, wait at least 30 seconds to start the print.

Make sure there are no small cured particles in the material. If found, then the material must be filtered using the plastic funnel, cone-shaped paint filter, and a spare material bottle. See *the Envision One Maintenance Guide for more information*.

Post-Processing

8 Cleaning the printed models

After the print job is complete and the models have been removed from the build platform, the models must be cleaned, dried, the supports removed (when applicable), and the models post cured. This process is referred to as "Post-Processing."

E-AquaModel material requires a three-phase cleaning process. **Always wear gloves when handling uncured material.**

First cleaning phase -

- 1 Fill the first plastic container with room temp water, 68° F / 20° C
- 2 Fully submerge each model in the plastic container. Use the brush to gently clean the surface of the models for 30 seconds

Second cleaning phase -

- 1 Fill the ultrasonic cleaner with clean water. Preheat the ultrasonic to 122°F/50°C
- 2 Place the models on the grate and gently lower the handle to submerge the models
- 3 Run the ultrasonic cleaner for 15 min

Third cleaning phase -

- 1 Fill the second plastic container with room temperature water, 68°F/20°C
- 2 Fully submerge each model in the plastic container. Use the brush to gently agitate the surface of the model for 10 seconds
- 3 **The water in the second plastic container must be filtered after every use. See the final section of this guide, *Maintenance*, for instructions**

9 Drying the models

Dry models with compressed air for 30 seconds. A can of compressed air is not sufficient for this process.

Examine each model for variations in the surface quality. Clean models with have a uniform matte finish. Glossy sections indicate uncured material is still present.

If needed, return the models to the ultrasonic cleaner for an additional 10 minutes. Rinse in the plastic container for 10 seconds, and dry with compressed air.

Allow the models to continue air drying on a clean, dry paper towel for a **minimum of 30 minutes**.

10 Removing supports (when applicable)

Carefully remove supports with a X-Acto knife, snips, or a similar tool. The supported surface can be polished after post-curing.

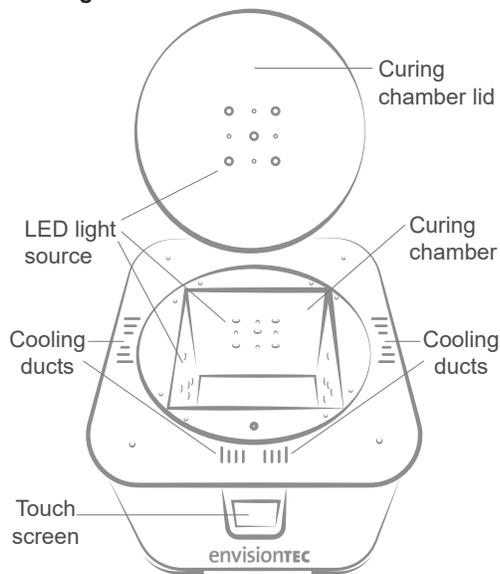
11 Post curing the models

Cure the models using the following method -

- PCA 4000:** 5 min - 100% intensity - 20°C
- See the *PCA 4000 User Manual* for more information

Place models into the curing unit with as much space between models as possible. Models should never touch one another while curing. Let models cool completely before handling them. *EnvisionTEC only supports EnvisionTEC curing ovens. It is not the responsibility of EnvisionTEC to support third party curing ovens.*

Fig. 3 PCA 4000 CURING CHAMBER



Maintenance

12 Filtering the water

Over time, the water in the ultrasonic cleaner will become saturated with uncured material. When a brush handle submerged in the ultrasonic is no longer visible, then the water in the ultrasonic cleaner must be filtered using the Lifestraw Water Filter System -

- 1 Power off the ultrasonic cleaner and unplug the unit
- 2 Carefully pour the water from the ultrasonic into the Lifestraw Water Filter System. See the *Lifestraw Water Filter System User Manual* for further filtering instructions
- 3 Repeat this process when the water in the first plastic container is fully saturated with uncured material
- 4 Repeat this process after every use for the second plastic container

The Lifestraw Water Filter System must be positioned in an area **protected from direct sun light** and ambient light sources. Use reasonable light protection.

Do not pour water from the Lifestraw Water Filter System down the drain. If for some reason the water from the Lifestraw Water Filter System is no longer needed, dispose of the waste according to official local regulations.

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