

envisionTEC

Technical Guide

Dental Models Workflow in E-Model Light

E-Model Light material is intended to produce dental models and aligner models for the creation of dental prostheses and orthodontic appliances. This technical guide details the best practices for preparing models, post-processing, and finishing.

Applicable Printers: D4K Pro, Envision One cDLM, Micro Plus series, P4K series, P4 LED series, P4 series, Vida Domeless cDLM, Vida series

Primary Supplies

- 99% isopropyl alcohol (IPA)
- Air compressor
- Bottle rolling machine
- Cone-shaped paint filter, *Envision One, D4K: Starter Kit*
- Nitrile gloves
- PCA 4000 curing unit
Order from EnvisionTEC -
SAP # ACC-06-1000
OR Otofash curing unit
Order from EnvisionTEC -
SAP Part # ACC-00-0007
- Paint scraper, *Envision One, D4K: Starter Kit*
- Paper towels
- PWA 2000 parts washer
Order from EnvisionTEC -
SAP # ACC-22-2000
OR 3 post-processing
containers, 1 qt each
- Plastic funnel
- Rubber spatula, *Envision One, D4K: Starter Kit*, or mixing cards
- Spray bottle with 99% IPA
- Snips, X-Acto knife, or similar tool
- Storage container for material - sealable and opaque
- Ultrasonic cleaner

Getting Started

1 Capturing patient data

A digital impression can be accomplished with a handheld intra-oral scanner and CBCT scan, or with a traditional impression and a desktop box scanner.

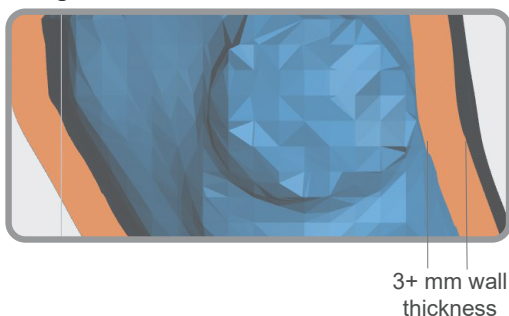
EnvisionTEC printers are compatible with the universal .STL file format and are thus compatible with almost all dental CAD and model design software as well as digital design services. Models may be designed in-house or outsourced to a design partner.

2 Designing models for E-Model Light

Hollow dental models printed in E-Model Light must have a minimum wall thickness of 3 mm. Channels or drainage holes may be added as well.

If channels and/or drainage holes are not added to the design, the hollow model must be printed on supports. This will allow uncured material to drain from the hollow feature during the printing process.

Fig. 1 HOLLOW MODEL WALL THICKNESS



Software

3 Orienting models in RP software

Orient models in Envision One RP or Perfactory RP software (printer dependent) with the flat base side down, facing the build platform.

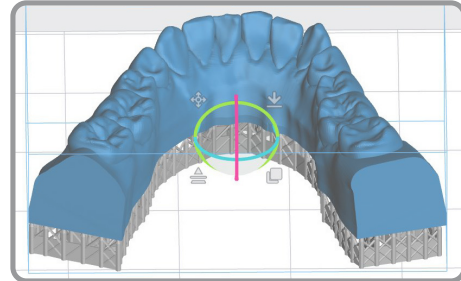
Spacing: place models a minimum of 2.5 mm apart

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-Model Light.ini support file.

Fig. 2 SUPPORTED HOLLOW MODEL



4 Using Hyper Print - Dental Models in Envision One RP software

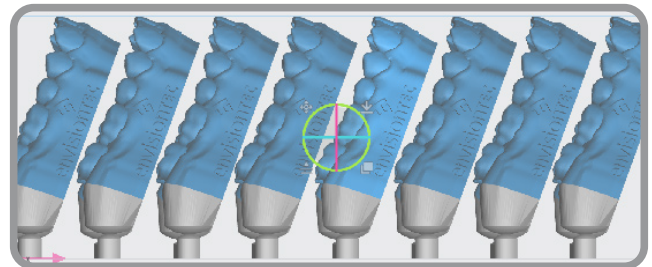
The **Dental Models** option in the **Hyper Print** menu can be used to quickly orient all selected orthodontic models. The **Dental Models** option will align the largest flat surface with the build platform, space the models across the build platform, and transfer the job automatically to the printer.

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

If desired, orthodontic models printed in E-Model Light 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 model after printing due to the specially designed grooves.

Fig. 3 HYPER PRINT A-TYPE JAWS



Print Preparation

6 Mixing the material

E-Model Light should be stored and processed at room temperature. E-Model Light material must be mixed in the material bottle prior to use -

- 1 Place the sealed material bottle in an ultrasonic bath for 5-10 min
- 2 Shake the bottle well
- 3 Place the sealed material bottle on a bottle roller for a minimum of 30 minutes. Ceramic balls are recommended
- 4 Wait for bubbles to subside before filling the material tray
- 5 Mix material in the material tray gently with the rubber spatula from the Starter Kit (Envision One) or a mixing card (DLP) before each print. The material should be a uniform color

Ensure 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 *Support Center for filtering instructions on the [Envision One](#) and [D4K Pro](#)*, or see the *Maintenance Guide for more information*.

7 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 at the start of the print job.

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 *Support Center for instructions for the [Envision One](#) and [D4K Pro](#)*, or see the *Start Guide for more information*.

8 Printing with E-Model Light material

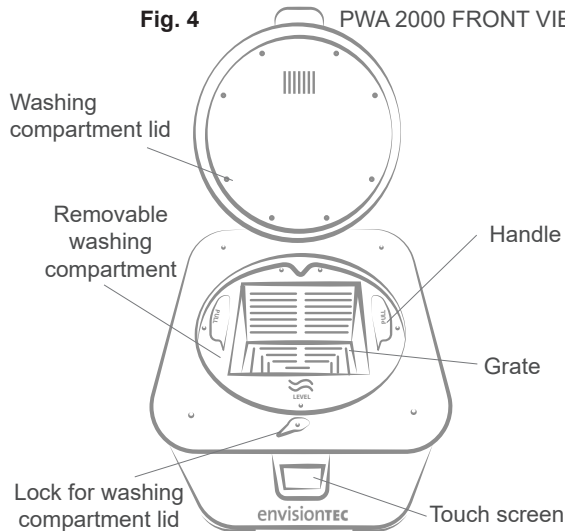
Follow instructions in the printer's User Manual to start the print. Follow instructions in the printer's User Manual to remove the models from the build platform after the print is complete. See the *Support Center for the [Envision One](#) and [D4K Pro](#)*, or contact [EnvisionTEC Technical Support](#) to receive the User Manual.

Post-Processing

9 Cleaning the printed models

The PWA 2000 is the recommended parts washer. **Always wear gloves when handling uncured material and IPA.**

Fig. 4 PWA 2000 FRONT VIEW



- 1 Open the washing compartment lid
- 2 Lift the handle to raise the interior grate to the highest position
- 3 Pour the 99% IPA into the washing compartment to just below the grate while it is in the lifted position
- 4 Place the model on the grate and gently lower the handle to submerge the model in IPA
- 5 Close the washing compartment lid and lock in place
- 6 Plug in the power cable to turn on the PWA-2000
- 7 Using the touch screen, select the **High** washing program. Use the **Minus** button to set the timer to **00:03:00**, or 3 minutes. Press **Start**
- 8 **Remove the model as soon as the program is complete**
- 9 Spray the models with the spray bottle filled with 99% IPA
- 10 Use compressed air to remove all IPA from the surface of the model as soon as possible

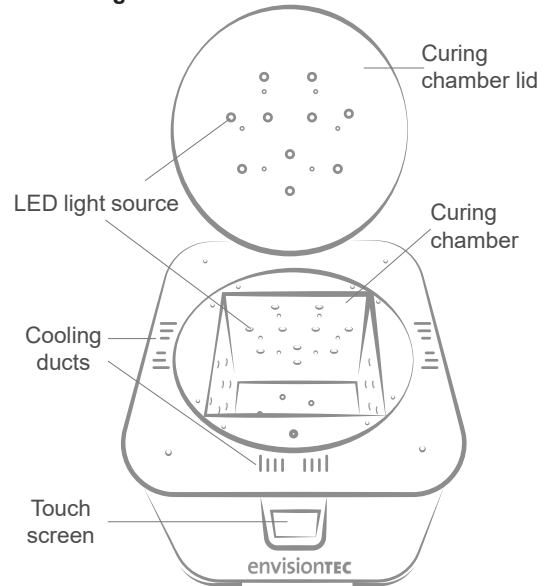
Do not expose E-Model Light models to alcohol for longer than 5 minutes. Excess exposure to alcohol will dry out the model.

10 Removing supports (when applicable)

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

If models were printed vertically using the **Hyper Print - A-Type Jaws** option, the support blocks can be easily removed by bending and snapping at the specially designed groove, *Fig. 3*.

Fig. 5 PCA 4000 CURING CHAMBER



11 Post curing the models

Cure the models using one of the following methods -

PCA 4000: 00:01:00 / 20° C / 100% power

See the *PCA 4000 technical guide for instructions on setting a custom curing program*

OtoFlash: 2 cycles for 300 flashes, flip models between cycles

See the *Otoflash User Manual for more information*

Place models into the curing machine with as much space between models as possible. Models should never touch one another while curing. Let models cool completely before handling them or starting the next cycle. Flip models between cycles for an even cure. *EnvisionTEC only supports EnvisionTEC curing ovens. It is not the responsibility of EnvisionTEC to support third party curing ovens.*

12 Release agent for dental models

EnvisionTEC does not recommend a specific isolation or release agent for the production of orthodontic appliances. Vaseline, Siliform (Trigroup Technologies), or any other release agent may be used. *Follow instructions from the manufacturer.*

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