Model Z Material Best Practice

Desktop Health

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About Model Z

Identification

Model Z is as effective as it is fast. This low viscosity model material is ideal for thermoforming models, diagnostic models and orthodontic appliance models requiring a smooth surface resolution, easy clean-up and a superior fit and finish.

This technical guide details the best practices for preparing models, post-processing, and finishing.

Applicable Printers

This material is tested and approved for the following printers:

- Einstein™
- Envision One cDLM
- D4K Pro

Fig. 1 EINSTEIN™ FRONT VIEW

Hood
Build platform knob
Build platform handle
Build platform
Z Axis
Hood hinge
Material tray
Material tray latch
RFID material tag reader (not shown)
Touchscreen
Power button
USB port

Getting Started

Primary Supplies

The following supplies are required to print Model Z material:

- 99% isopropyl alcohol (IPA).
- Air compressor.
- Cone-shaped paint filter, *Starter Kit item.*
- Curing unit: Otoflash *SAP Part # ACC-00-0007,* or PCA 4000 *SAP Part # ACC-06-1000.*
- Dual Motion Bottle Roller, *SAP Part # ACC-26-1000 (110V) and ACC-26-1000 (220V).*
- Nitrile gloves.
- Paint scraper, *Starter Kit item.*
- Paper towels.
- Plastic funnel.
- Rubber spatula, *Starter Kit item.*
- Spray bottle with 99% IPA.
- Snips, precision blade, or similar tool.
- Storage container for material, sealable and opaque.
- Washing unit: PWA 2000, *SAP # ACC-22-2000*.

Capture Patient Data

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

Envision One RP Software is compatible with the universal .STL file format and is 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.

Design Models for Model Z

Hollow dental models printed in Model Z must have a minimum wall thickness of 3 mm, *Fig. 2*.

Fig. 2   HOLLOW MODEL WALL THICKNESS

3+ mm wall
thickness
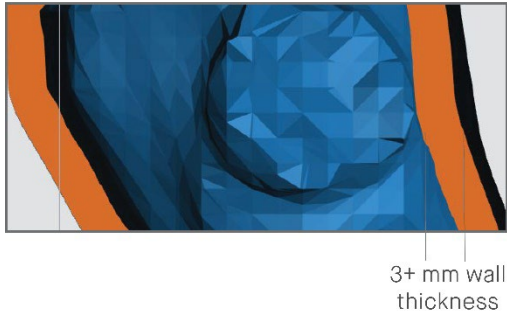
It is recommended to add channels or drainage holes to hollow models. This allows uncured material to drain from the hollow feature during the printing process.

Software

Orient Models Envision One RP Software

Orient models in Envision One RP Software 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 models 0 mm from the build platform.
- **Resolution:** 100 µm Z resolution.

Autopilot| Models

Autopilot| Models in Envision One RP Software can be used to quickly orient all selected orthodontic models.

Fig. 3   AUTOPILOT | MODELS
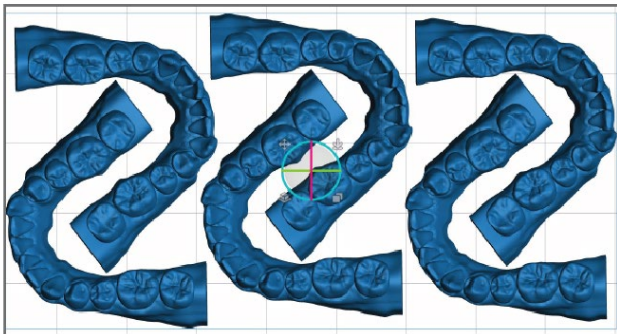
Models: Aligns the largest flat surface with the build platform, spaces the models across the build platform, and transfers the job automatically to the printer.

Print Preparation

Mix Material

Model Z material must be mixed in the material bottle prior to use:
1. Place the sealed material bottle on the Dual Motion Bottle Roller for a minimum of 30 minutes.
2. Wait for bubbles to subside before filling the material tray.
3. Mix material in the material tray gently with the rubber spatula from the Starter Kit 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 Knowledge Base for filtering instructions.*

Fill Material Tray

Do not overfill the material tray. Overfilling can cause the material to 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 prints. Adding material while the print is paused, or during a print, will cause a small shift line in the model. *See the Knowledge Base for instructions adding material.*

Print with Model Z Material

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, follow instructions in the printer's User Manual. *See the Knowledge Base for the latest User Manual.*
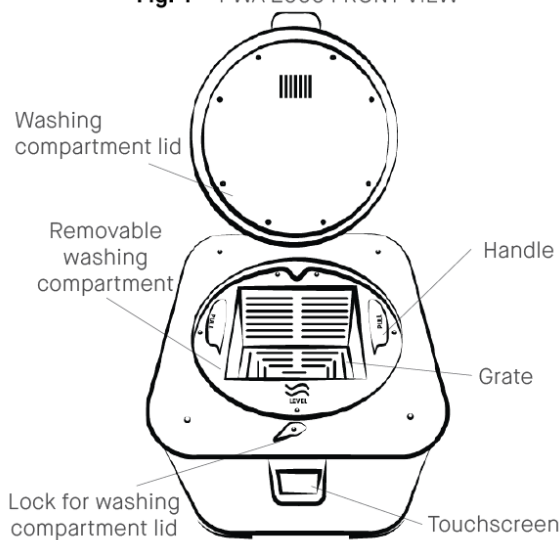
Post-Processing

Clean Printed Models

The PWA 2000 is the recommended parts washer, *Fig. 4*. Always wear gloves when handling uncured material and alcohol.

> **Important: Do not expose Model Z to alcohol for longer than 5 minutes.** Excess exposure to alcohol will dry out the model.

Fig. 4 PWA 2000 FRONT VIEW

Washing compartment lid

Removable washing compartment

Handle

Grate

Lock for washing compartment lid

Touchscreen

Clean models the PWA 2000:
1. Open the washing compartment lid.
2. Lift the handle to raise the interior grate to the highest position.

4. Place the model on the grate and gently lower the handle to submerge the model in 99% 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 touchscreen, select the **High** washing program. Set the timer to 00:03:00, or 3 minutes. Press **Start**.
   → The PWA 2000 will immediately begin the set washing cycle.
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.

Dry Models

Models must be completely dry before post curing –
1. Place the models on a clean paper towel lined surface.
    2. Air dry in ambient room temperature / humidity for 10 min.

Post Cure Printed Models

Cure the models using one of the following methods:

Otoflash: 2 cycles for 500 flashes, flip models between cycles.
See the __Knowledge Base__ for instructions setting an Otoflash curing cycle.

PCA 4000: 1 Minute - 20° C - 100% Power.
See the __Knowledge Base__ for instructions setting a PCA 4000 curing cycle.

Fig. 5 OTOFLASH FRONT VIEW

Fig. 6 PCA 4000 FRONT VIEW
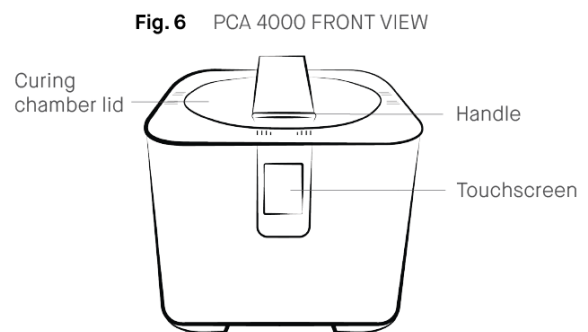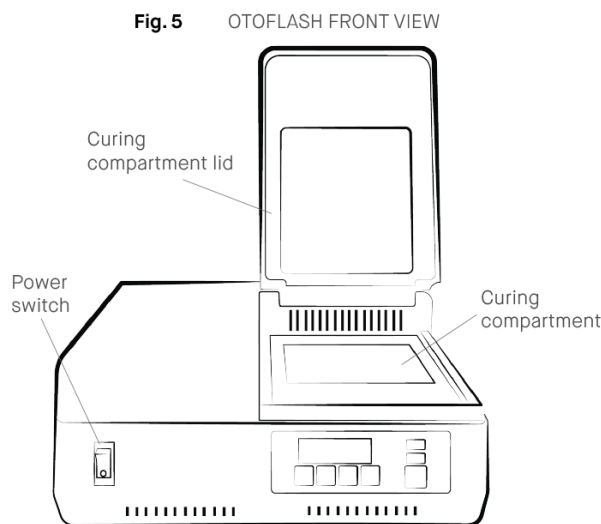
Place models into the curing unit with as much space between models as possible. Models should never touch one another while curing. Let models cool completely before handling them or starting the next cycle. Flip models between cycles for an even cure.

> **Important:** Desktop Health does not support third-party curing units.

Release Agents

Desktop Health does not recommend a specific isolation or release agent for the production of orthodontic appliances. Vaseline®, Siliform®, or any other release agent may be used. Follow instructions from the manufacturer.