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# Technical Guide
## E-UA90 Best Practices

EnvisionTEC's E-UA90 is a UV curable 3D printing resin, designed to be highly flexible and resilient, with thermo-set rubber-like properties. A semi-translucent silicone, E-UA90 has good tear strength and excellent energy rebound. E-UA90 is good for general purpose elastomer parts such as robotic grippers.

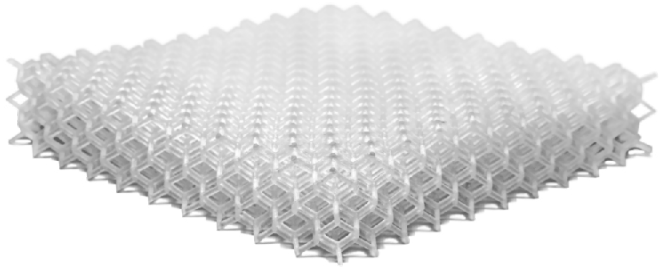
This technical guide details the best practices for preparing models, post-processing, and material handling.

**Applicable Printers:** Envision One cDLM, P4K printer series

## Primary Supplies

99% isopropyl alcohol (IPA)
Air compressor
Cone-shaped paint filter (from Starter Kit)
Convection oven
Dawn dish soap
Disposable loaf pans 8.5 x 4.5 in, two minimum
Heated ultrasonic cleaner 10 Lt, three recommended
Loctite CL36 LED Curing Chamber
Nitrile gloves
Paint brush
Paper towels
Paint scraper (from Starter Kit)
Plastic funnel
Rubber spatula (from Starter Kit) or mixing cards
Spray bottle (for 99% IPA)
Storage containers for material - sealable and opaque

**Fig. 1** MODEL PRINTED IN E-UA90



## Getting Started

**Designing models for E-UA90**

Models printed in E-UA90 must have -

**Minimum wall thickness for solid models - 1 mm**
**Minimum wall thickness for hollow models - 3 mm**

***Read this technical guide in full*** before starting a print in E-UA90 material.

## Software

**Orienting models in RP software**

**Spacing:** *place models a minimum of **2 mm apart***
**Level at build platform for models with supports:** *place models **5 mm** from the build platform and **enable base support***
**Resolution:** *only print at 150 µm and 300 µm Z resolution*

E-UA90 material has a very high viscosity and requires more space between models for the material to flow during a print.

## Material Preparation

**Storing the material between prints**

Once E-UA90 material is poured from the original bottle, the material will **expire in five days**. Do not mix fresh material with material that has left the bottle.

***Do not pour material from the material tray back into the original material bottle.***

E-UA90 should be stored at a standard room temperature of 70° F (21° C) to 75° F (24° C). This material works best in a space with a minimum ambient temperature of 73° F (23° C).

E-UA90 does not separate easily and does not require a bottle roller for storage. *See the Safety Data Sheet for material safety information. All SDS are available at EnvisionTEC.com/Safety-Data-Sheets.*

**Filling the material tray**

The material tray should not be filled more than half way to prevent overflow when the build platform moves down at the start of a 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. **Once E-UA90 material is poured from the original bottle into the material tray, the material will expire in five days**.

**Printing with E-UA90 material**

Mix the material in the material tray gently with the rubber spatula from the Starter Kit (Envision One) or a mixing card (P4K) before each print. Make sure there are no small cured particles in the material.

If cured paricles are found in the material, then the material must be filtered. *See the Material Tray Best Practices guide for instructions for filtering the material.*

Once E-UA90 material is poured into the material tray, the material will **expire in five days**. *See the Material Tray Best Practices guide for instructions for emptying and cleaning the material tray.*

## Post-Processing

**1 After a print job is complete**

E-UA90 material has a very high viscosity and uncured material can be difficult to remove from the surface of printed models.

**When the printer completes a print job, leave the printed models on the build platform for a minimum of 20 minutes**. This will allow the majority of the excess uncured material to drip naturally off of the printed models and into the material tray.

**2 Setting up the Post Processing Zone**

Three heated ultrasonic cleaners are recommended for removing uncured E-UA90 material from the surface of printed models. Always wear gloves when handling uncured material and 99% isopropyl alcohol.

Designate an area away from the printer as the Post Processing Zone.

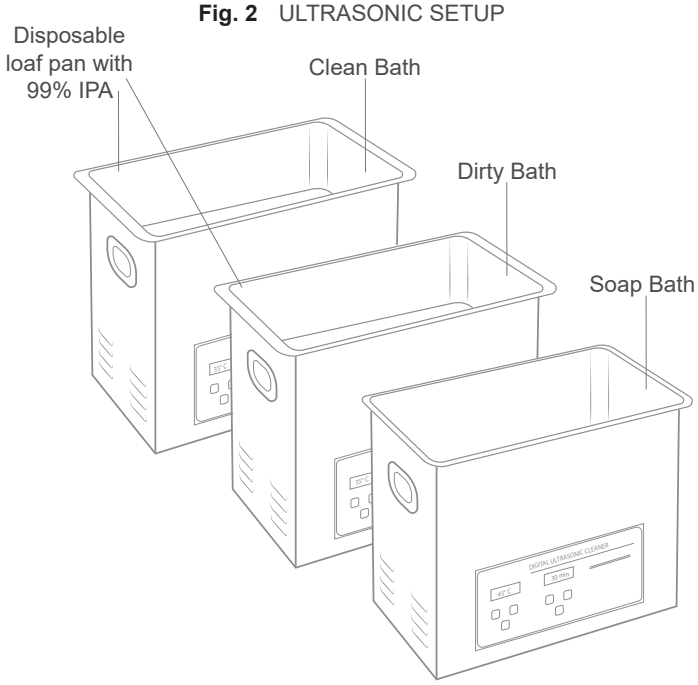
Set up the three heated ultrasonic cleaners, two loaf pans, 99% IPA, and spray bottle in the Post Processing Zone -

**1** Fill the three ultrasonic cleaners with water as directed by the manufacturer
**2** Add Dawn dish soap to one ultrasonic cleaner in the following ratio: 1 tbsp dish soap per 3 Lt water
**3** Place one pan in the two remaining ultrasonics, and fill each pan with 99% IPA. Each pan must be filled with enough IPA to fully submerge the printed models without overflowing
**4** Fill the spray bottle with 99% IPA

Refer to the ultrasonic cleaners as follows -

**"Soap Bath"** This is the first the models will be placed in for cleaning. It is referred to as the "soap bath" because this ultrasonic is filled with a soap and water solution.
**"Dirty Bath"** This is the second the models will be placed in for cleaning. It is referred to as the "dirty bath" because this solution will receive the most amount of uncured material.
**"Clean Bath"** This is the third the models will be placed in. It will receive the least uncured material.

**Fig. 2** ULTRASONIC SETUP




**3 Cleaning the printed models**

**1 Preheat the ultrasonic cleaners:** Soap Bath to 113° F (45° C), Dirty Bath and Clean Bath to 95° F (35° C)
**2** Place the models in the Soap Bath. **Wash the models in the Soap Bath for 30 min**
**3** After 30 min, **brush the models** to remove residual material. Remove the models from the Soap Bath and **remove any supports** from the model using snips
**4** Place the models in the pan of 99% IPA in the Dirty Bath. **Wash the models in the Dirty Bath for 10 min**, brushing if necessary
**5** Place the models in the pan of 99% IPA in the Clean Bath. **Wash the models in the Clean Bath for 10 min**, brushing if necessary
**6** Remove the models from the Clean Bath. Spray the models with the spray bottle of 99% IPA
**7** Use compressed air to remove all IPA from the surface of the model and dry the models

Do not expose E-UA90 material to alcohol for longer than the recommended cleaning times. Excess exposure to alcohol will dry out the models.

**4 Drying the printed models**

Preheat the convection oven to 98.5° F (37° C). **Place the models in the convection oven for one hour to dry.**

**5 Post curing models**

Cure the models using one of the following methods -

**Loctite CL36 LED Curing Chamber:** 100% power, 2 x 30 min
*See the Loctite CL36 technical guide for instructions on setting a custom curing program*

Place models into the curing machine with as much space between models as possible. Models should never touch one another while post curing. Let models cool completely before handling them or starting the next cycle. Flip models between cycles for an even cure.

*Curing options vary, based on chosen methods. EnvisionTEC only supports EnvisionTEC curing ovens. Any other post curing oven has to be calibrated by the client. It is not the responsibility of EnvisionTEC to support third party curing ovens.*

**6 Finishing the models**

Finishing involves using sandpaper and other tools to smooth the supported surfaces of models. Initially, rough areas left by supports can be carefully sanded using a fine Dremel bit followed by sandpaper. Sand beginning with 150 grit sand paper.





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