envisionTEC

Material Best Practices

Loctite E-IND406 HDT100 High Elongation

Loctite E-IND406 HDT100 High Elongation is a high-strength, high elongation engineering plastic with good impact resistance and high temperature resistance. Stiffness, toughness and thermal durability make this material ideal for a wide variety of tools on the production floor and for final part production in automotive and general industry. The product is ideal for tooling, interior and machinery parts. The unique set of performance attributes makes it comparable to ABS. Parts can be printed and then machined, tapped, or polished for a final finish.

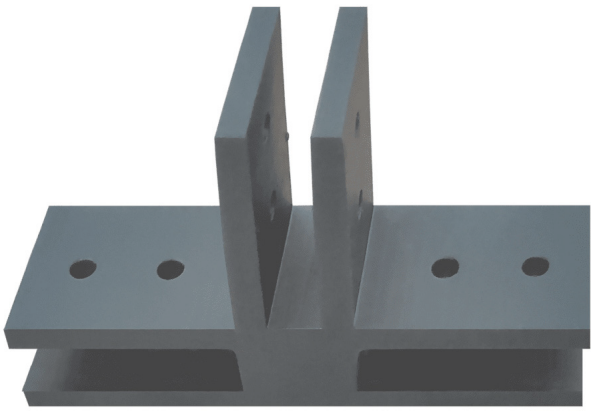
This technical guide details the best practices for preparing models, post-processing, and material handling.

Applicable Printers: Envision One cDLM series

Primary Supplies

- 99% isopropyl alcohol (IPA)
- Air compressor
- Cone-shaped paint filter (from Starter Kit)
- Convection oven, capable of holding 140°C for 2 hours
- Heat resistant gloves
- Nitrile gloves
- Paint brush
- Paper towels
- Paint scraper (from Starter Kit)
- PCA 4000 curing unit Order from EnvisionTEC - SAP # ACC-06-1000
- Plastic funnel
- 2 Plastic post-processing containers, 1 qt each
- Rubber spatula (from Starter Kit)
- Spray bottle (for 99% IPA)
- Storage containers for material - sealable and opaque

Fig. 1 LOCTITE E-IND406 HDT100 HIGH ELONGATION



Getting Started

1 Designing models for Loctite E-IND406
Models printed in Loctite E-IND406 must have a **minimum wall thickness of 1.5 mm.** Thin geometries should be avoided in E-IND406.

Read this technical guide in full before starting a print in Loctite E-IND406 material.

Software

2 Orienting models in RP software

> **Spacing:** *place models a minimum of **2.5 mm apart.***
> **Level at build platform for models with supports:** *place models **5 mm** from the build platform.*
> **Resolution:** *100 µm Z resolution.*

It is recommended to print models in Loctite E-IND406 material flat-to-plate for best possible results.

3 Supporting models in RP software
Some approved applications require supports. Always use **E-IND 406 Base.ini** file for supports-

> **Minimum support base:** 1.2 mm
> **Minimum contact tip:** 0.5 mm
> **Minimum support beam height:** 5 mm

Material Preparation

4 Storing the material between prints
Loctite E-IND406 should be stored at a standard room temperature of 70° F (21° C) to 75° F (24° C). This material performs best in a space with a minimum ambient temperature of 73° F (23° C). *See the Safety Data Sheet for material safety information.*

5 Mixing the material
Loctite E-IND406 mixing requirements:

> Mix the sealed material bottle on a bottle roller for a **minimum of 30 min** prior to adding material to the printer.

6 Filling the material tray
The material tray should not be filled more than half way to prevent overflow 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.

7 Printing with Loctite E-IND406 material
Mix the material in the material tray gently with the rubber spatula from the Starter Kit before each print. Make sure there are no small cured particles in the material.

If cured particles are found in the material, then the material must be filtered. *See Maintaining EnvisionTEC Materials or the Maintenance guide for instructions for filtering the material.*

Post-Processing

8 Setting up the Post Processing Zone
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."

Set up the two post-processing containers and the spray bottle filled with 99% IPA in the Post Processing Zone. Refer to the three post-processing containers as follows -

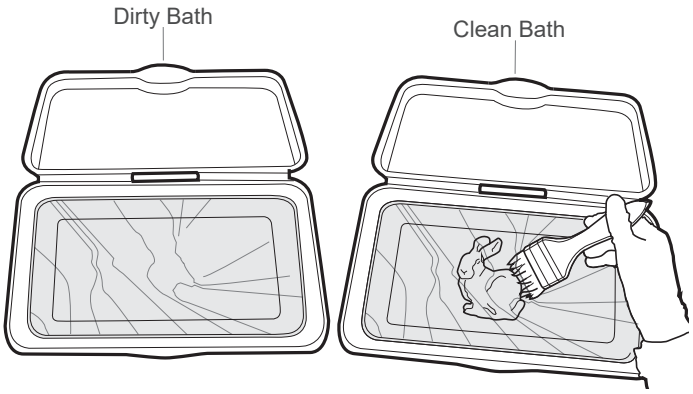
> **"Dirty Bath"** - This is the first the models will be placed in for cleaning. It is referred to as the "dirty bath" because this solution will receive the most uncured material.
> **"Clean Bath"** - This is the last the models will be placed in. It will receive the least uncured material.

9 Cleaning the printed models
Loctite E-IND406 material requires a three-phase cleaning process.
Always wear gloves when handling uncured material.

> **1** Place the models in the **Dirty Bath** and **agitate with the paint brush for 3-4 min**. Remove the models from the **Dirty Bath** and **spray with compressed air**.
> **2 Remove any supports** from the model using snips, if applicable
> **3** Place the models in the **Clean Bath for 3 min**, agitating with the brush if necessary. Remove the models from the **Clean Bath** and **spray with compressed air**.
> **4 Spray the models** with the spray bottle of 99% IPA, then spray with compressed air. Use compressed air to remove all IPA from the surface of the model and dry the models.

Do not expose Loctite E-IND406 material to alcohol for longer than the recommended cleaning times. Excess exposure to alcohol will cause curling issues.

Fig. 2 POST-PROCESSING CONTAINERS



10 Drying the models
Preheat the convection oven to 98.5° F (37° C). **Place the models in the convection oven for 30 min to dry.**

> *Caution:* Models will be **warm** after drying cycle. **Heat resistant gloves are recommended**, but not required.

11 Post curing models
Cure the models using the following method -

> **PCA 4000:** 00:60:00 / 20° C / 100% power
> *See the PCA 4000 technical guide for instructions on setting a custom curing program.*

Place models into the curing unit with as much space between models as possible. Models should never touch one another while post curing.

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.

12 Cooling the models
Immediately after the curing cycle, **remove the models from the curing unit and set on a paper towel-lined surface for 10 minutes.**

> *Caution:* Models will be **warm** after curing cycle. **Heat resistant gloves are recommended**, but not required.

13 Heat curing the models
Loctite E-IND406 requires a final heat curing step -

> **1** Place the models in the convection oven at room temperature.
> **2** Heat the oven and models to **284° F (140° C)**.
> **3** Leave the models in the convection oven for **2 hours** after reaching maximum temperature.
>
> *Caution:* Models will be **HOT** after the heat curing cycle. **Heat resistant gloves are required**.

14 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 80 grit sand paper.