

LOCTITE E-3843 Material Best Practice

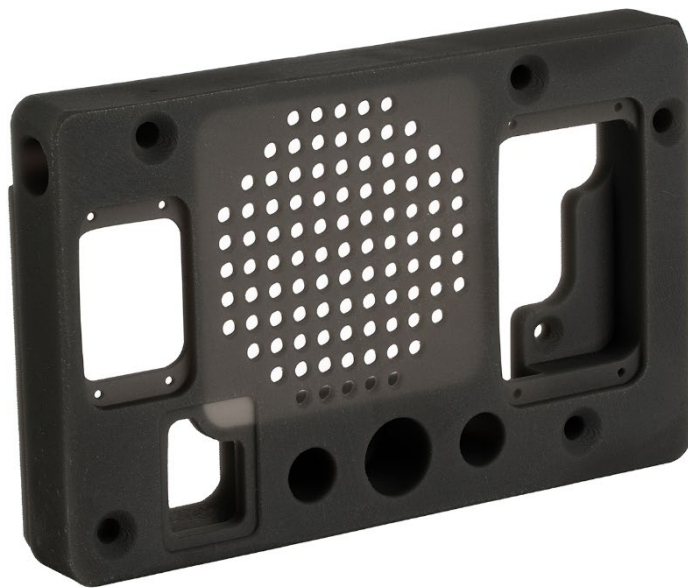


Table of Contents

Document Information	3
Legal Notice	3
History of Changes	3
How to Use This Guide	3
About LOCTITE E-3843	4
Identification	4
Applicable Printers	4
Getting Started	5
Primary Supplies	5
Design Parts for LOCTITE E-3843	5
Software	7
Orient Parts Envision One RP Software	7
Support Parts Envision One RP Software	7
Print Preparation	8
Fill Material Vat/Material Tray	8
Print with LOCTITE E-3843 Material	8
Post-Processing	9
Clean Printed Parts	9
Dry Parts	10
Post Cure Printed Parts	10
Manufacturer	11

Document Information

Legal Notice

This document contains information that is confidential and proprietary to Desktop Metal, Inc. and/or its affiliates, including without limitation EnvisionTEC US LLC and ExOne Operating, LLC (each a “DM Company,” and together the “DM Companies”). This information is provided only to authorized representatives or customers of the DM Companies, and solely for the purpose of facilitating the use of DM Companies’ products and services. This document and its contents shall not be used or distributed for any other purposes or communicated, disclosed or copied except as agreed by a DM Company in writing. The information contained herein is provided for reference only and subject to change without notice. This document provides general information about the products described herein and is not a substitute for the Instructions For Use and Safety Data Sheets for said products. The DM Companies shall not be liable for omissions or for technical or editorial errors contained herein or for any damages whatsoever arising in connection with the furnishing or use of this document. This information is not intended to be used to determine the suitability or reliability of the user’s specific applications or environments; these determinations are the sole responsibility of the user, and the DM Companies disclaim all liability associated therewith. Without limiting the foregoing, the user is solely responsible for the use and operation of the products and services, including the disposal of waste products in connection therewith. This document does not supplement, replace or otherwise modify the terms and conditions that govern the purchase and sale or use of DM Companies’ products or services. Furthermore, nothing herein shall constitute a warranty; the only warranties for DM Companies’ products and services are those set forth in the express warranty statement in the terms and conditions of sale for said products and services. Desktop Metal, the DM Logo, Bound Metal Deposition, BMD, Live Parts, Studio System, Shop System, Fabricate, Fiber, Production System, Desktop Health, Desktop University, Flexcera, Einstein and ETEC are trademarks of Desktop Metal, Inc. EnvisionTEC, Envision One, cDLM, Vida, Perfactory, D4K, Hyperprint and Xtreme 8K are trademarks of EnvisionTec GmbH and its affiliates. ExOne, the ExOne Logo, Innovent, Innovent+, InnoventX, X25Pro, X160Pro, X1, S-Max, S-Print, CleanFuse, NanoFuse, and HydroFuse are trademarks of ExOne Operating, LLC or its affiliates. All other trademarks used herein are the property of their respective owners.

© 2022 Desktop Metal, Inc. All rights reserved.

LOCTITE E-3843 Material Best Practice Guide: 3843-MBP-00010-Rev01-EN, October 2022

History of Changes

Date	Changes	Version
September-2022	Document creation	1.0

How to Use This Guide

This document serves as a comprehensive guide to prepare parts, post-process, and finish using LOCTITE E-3843 material.

About LOCTITE E-3843

Identification

LOCTITE® E-3843 is an ideal material for end use parts production or functional prototyping. An ETEC-validated material from Henkel, E-3843 is a high-performance, high-modulus product which boasts excellent flexural and tensile properties with a relatively high degree of elongation. It offers good impact resistance and thermal stability making it suitable for many demanding engineering applications.

Applicable Printers

This material is tested and approved for the following printers:

- Xtreme 8K
- Envision One cDLM

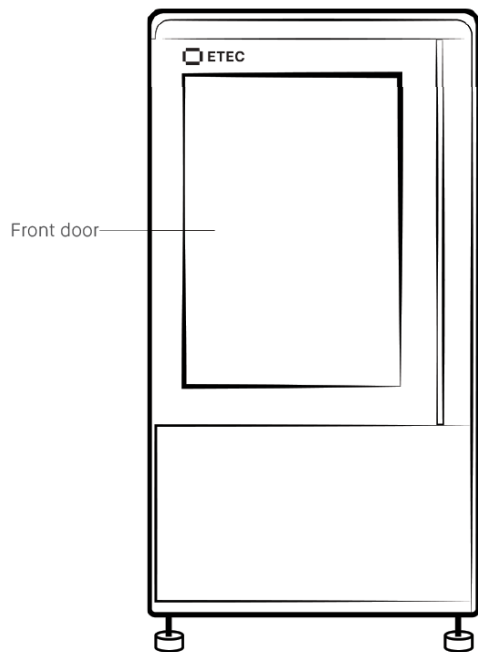


Fig. 1 Xtreme 8K Front View

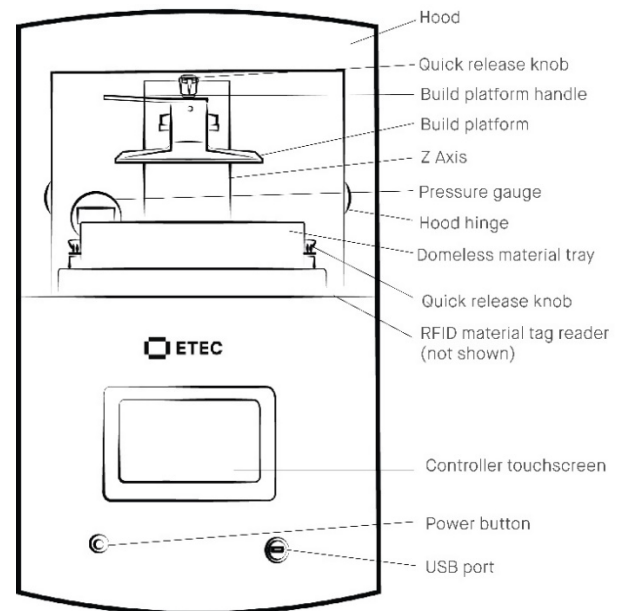


Fig. 2 Envision One cDLM Front View

Getting Started

Primary Supplies

The following supplies are required to print LOCTITE E-3843 material:

- 99% isopropyl alcohol (IPA).
- Air compressor.
- Envision One: Cone-shaped paint filter, *Starter Kit item*.
- Curing unit: PCA 4000 *SAP Part # ACC-06-1000*, or UVCA 3000 *SAP Part # ACC-02-1000*.
- Dual Motion Bottle Roller, *SAP Part # ACC-26-1000 (110V) and ACC-26-1000 (220V)*.
- Nitrile gloves.
- Paint scraper, *Starter Kit item*.
- Paper towels.
- Envision One: Plastic funnel.
- Envision One: Rubber spatula, *Starter Kit item*.
- Xtreme 8K: Mixing blade or an industrial spatula.
- Spray bottle with 99% IPA.
- Washing unit: PWA 2000, *SAP # ACC-22-2000*.

Design Parts for LOCTITE E-3843



Tip: Large flat areas on parts printed on the Xtreme 8K must be placed on supports rather than on the build platform.

It is recommended to add channels or drainage holes to hollow parts. This allows uncured material to drain from the hollow feature during the printing process.



Tip: Avoid thin geometries for parts printed on the Envision One.

Minimum Wall Thickness

Parts printed in LOCTITE E-3843 must have a minimum wall thickness of:

- Xtreme 8K: 0.20 mm.
- Envision One cDLM: 3.0 mm

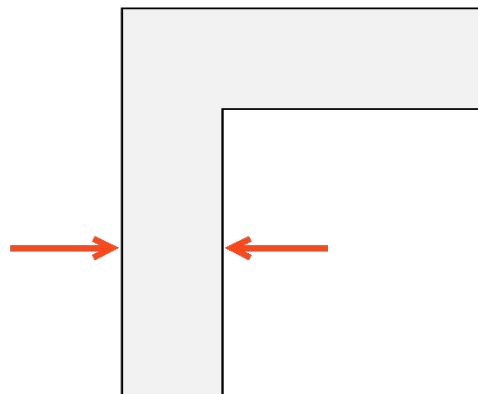


Fig. 3 Minimum Wall Thickness

Minimum Feature Size

Minimum feature size is dependent on:

- The specific printer,
- The material,
- And the feature geometry.



Important: Minimum feature sizes are only valid for smaller features within the part geometry (Ex: text, small channels, etc.). Minimum feature sizes should not be used for the main components of design methodology.

ETEC recommends the following minimum features sizes for parts printed in LOCTITE E-3843:

	Xtreme 8K	Envision One cDLM
Hole (Cylinder)	0.60 mm	1.0 mm
Hole (Rectangular Prism)	0.60 mm	1.0 mm
Bridge Gap	0.40 mm	0.50 mm
Unsupported Walls	0.20 mm	0.50 mm
Wire Thickness	0.50 mm	0.20 mm

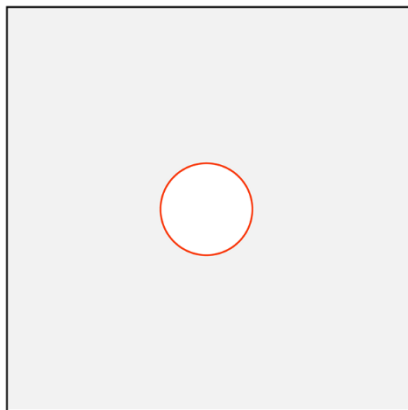


Fig. 4 Minimum Hole (Cylinder)

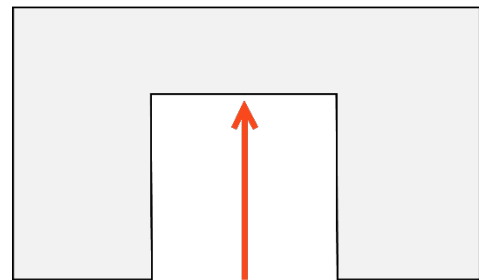


Fig. 5 Minimum Bridge Gap

Self-Supporting Angle

The maximum self-supporting angle for parts printed in LOCTITE E-3843 is 90° from horizontal. Angles as shallow as 30° may be printed without supports, but some deformation can occur.

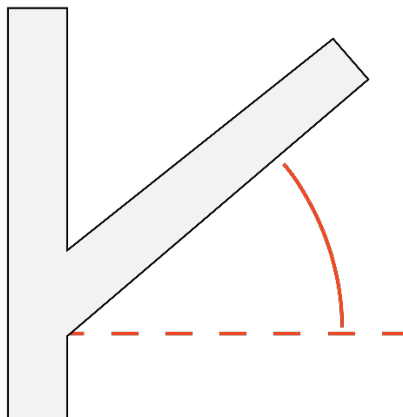


Fig. 6 Self-Supporting Angle

Software

Orient Parts Envision One RP Software

Envision One RP automatically orients your model, adds supports, if necessary, and sends the file to the printer, resulting in your three-dimensional model. Everything that is printed using ETEC printers must pass through this software successfully.

- **Spacing:** Place parts a minimum of 0.30 mm (Xtreme 8K)/1.50 mm (Envision One) apart.
- **Level at build platform:** Place unsupported parts directly on the build platform. Place supported parts 4.0 mm from the build platform.
- **Resolution:** 100 μ m Z resolution (dependent on layer thickness).

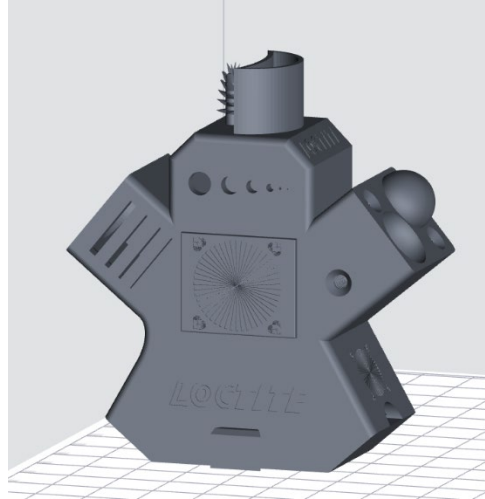


Fig. 7 Unsupported Part in Envision One RP Software

Support Parts Envision One RP Software

Some approved applications require supports. Always use the LOCTITE E-3843.ini support file:

- **Minimum support base:** 1.90 mm (Xtreme 8K)/2.0 mm (Envision One).
- **Minimum contact tip:** 0.50 mm (Xtreme 8K)/0.65 mm (Envision One).
- **Minimum support beam height:** 4.0 mm.

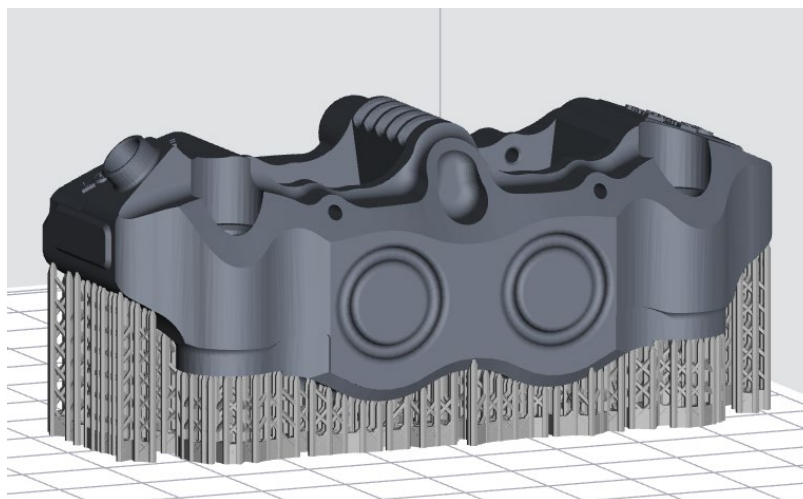


Fig. 8 Supported Part in Envision One RP Software

Print Preparation

Fill Material Vat/Material Tray

Do not overfill the material vat (Xtreme 8K)/material tray (Envision One). Overfilling can cause the material to overflow at the start of the print job.



Important: Ensure there are no small, cured particles in the material. If found, then the material must be filtered. See [Xtreme 8K](#) and [Envision One](#) filtering instructions.

Xtreme 8K

Material must be mixed before each print in the material vat for a minimum of 2-3 mins using a mixing blade or an industrial spatula the size of the vat. The material should be a uniform color.



Tip: Mix material before every print. Ensure the mixing tool reaches the bottom of the vat when mixing.

Material is automatically added to the material vat by the resin reservoir. See the [Knowledge Base](#) for more information.

Envision One

LOCTITE E-3843 material must be mixed prior to use on the Envision One:

1. Place the sealed material bottle on the Dual Motion Bottle Roller for a minimum of 60 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.

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 part. See the [Knowledge Base](#) for instructions on adding material.

Print with LOCTITE E-3843 Material

Before starting a print:

1. Ensure the build platform is clean and free of cured material.
2. Ensure the material level is correct.
3. Check the build platform level (Xtreme 8K only).
4. Check the recoating blade gap (Xtreme 8K only).

To start the print, follow instructions in the printer's Operations and Maintenance Guide.

To remove the parts from the build platform after the print is complete, follow instructions in the printer's Operations and Maintenance Guide. See the [Knowledge Base](#) for the latest Operations and Maintenance Guide.



Xtreme 8K Tip: To remove parts, place the paint scraper under one corner of the part, angling towards the opposite diagonal corner of the part. Use the rubber mallet to gently tap the back of the paint scraper. Work slowly to avoid chipping/fracturing parts.



Envision One Tip: Avoid leaving parts on the build platform for more than 12 hours. The gravity of dripping material can cause the parts to curl.

Post-Processing

Clean Printed Parts

Allow the material to drip off parts for 15 minutes before cleaning. Then, immediately remove and clean parts.



Tip: Time the end of the print in order to post process parts immediately. Ensure clean 99% IPA is available for part washing.

The PWA 2000 is the recommended parts washer for small and medium parts. Always wear gloves when handling uncured material and alcohol.



Important: A new washing solution for large parts is in development.

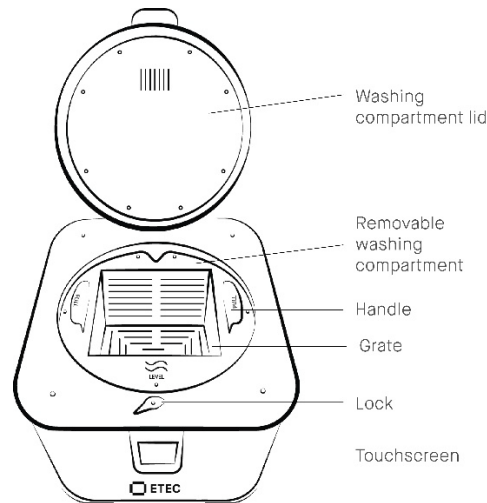


Fig. 9 PWA 2000 Front View



Important: Do not expose LOCTITE E-3843 to alcohol for longer than 5 minutes. Excess exposure to alcohol may cause slight color change and/or surface deterioration.

Getting Started

1. Open the washing compartment lid.
2. Lift the handle to raise the interior grate to the highest position.
3. Pour 99% IPA into the washing compartment to just below the raised grate.
4. Place the part on the grate and gently lower the handle to submerge the part 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.

Wash Cycle

1. Using the touchscreen, select the **High** washing program. Set the timer to **00:02:30, or 2.5 minutes**. Press **Start**.
→ *The PWA 2000 will immediately begin the set washing cycle.*
2. Remove the part(s) as soon as the program is complete.
3. Spray the part(s) with the spray bottle filled with 99% IPA.
4. Use compressed air to remove all IPA from the surface of the part(s) as soon as possible.
5. Repeat Steps 1 – 4 of the Wash Cycle.
6. If resin remains, spray the part(s) with the spray bottle and then dry with compressed air.
7. Repeat Step 6 of the Wash Cycle until the part(s) is completely clean.

Dry Parts

Parts must be completely dry before post curing:

1. Place the parts on a clean paper towel lined surface.
2. Air dry in ambient room temperature and ambient humidity for 10 min.

Post Cure Printed Parts



Important: Place parts into the curing unit with as much space between parts as possible. Parts should never touch one another while curing.



Important: Flip parts between cycles for an even cure. Let parts cool completely before handling them or starting the next cycle.

Cure the parts using one of the following methods:

Curing Unit	Time (H:MM:SS)	Temperature	Power
PCA 4000 See Programs and Features PCA 4000 .	Envision One: 2 x 15 Minutes. Xtreme 8K: 2 x 20 Minutes.	20° C	100%
UVCA 3000 See Hardware Operations UVCA 3000 .	Xtreme 8K only: 2 x 60 Minutes	20° C	100%

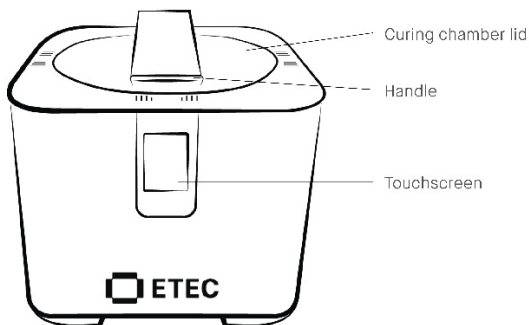


Fig. 10 PCA 4000 Front View

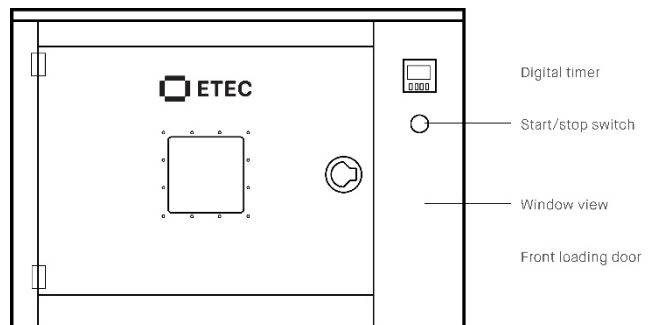


Fig. 11 UVCA 3000 Front View

Manufacturer

Desktop Metal, Inc.
63 3rd Avenue
Burlington, MA 01803
www.desktopmetal.com

Desktop Health
c/o Desktop Metal, Inc.
63 3rd Avenue
Burlington, MA 01803
www.health.desktopmetal.com

EnvisionTEC US LLC (ETEC)
15162 Commerce Dr. S
Dearborn, MI 48120
www.etec.desktopmetal.com

EnvisionTec GmbH
Brusseler Str. 51
45968 Gladbeck
Germany

ExOne Operating, LLC
127 Industry Boulevard
North Huntingdon, PA 15642
www.exone.com

ExOne GmbH
Daimlerstrasse 22
86368 Gersthofen
Germany

ExOne KK
161-5 Haneo
Odawara-shi, Kanagawa
Japan 256-0804