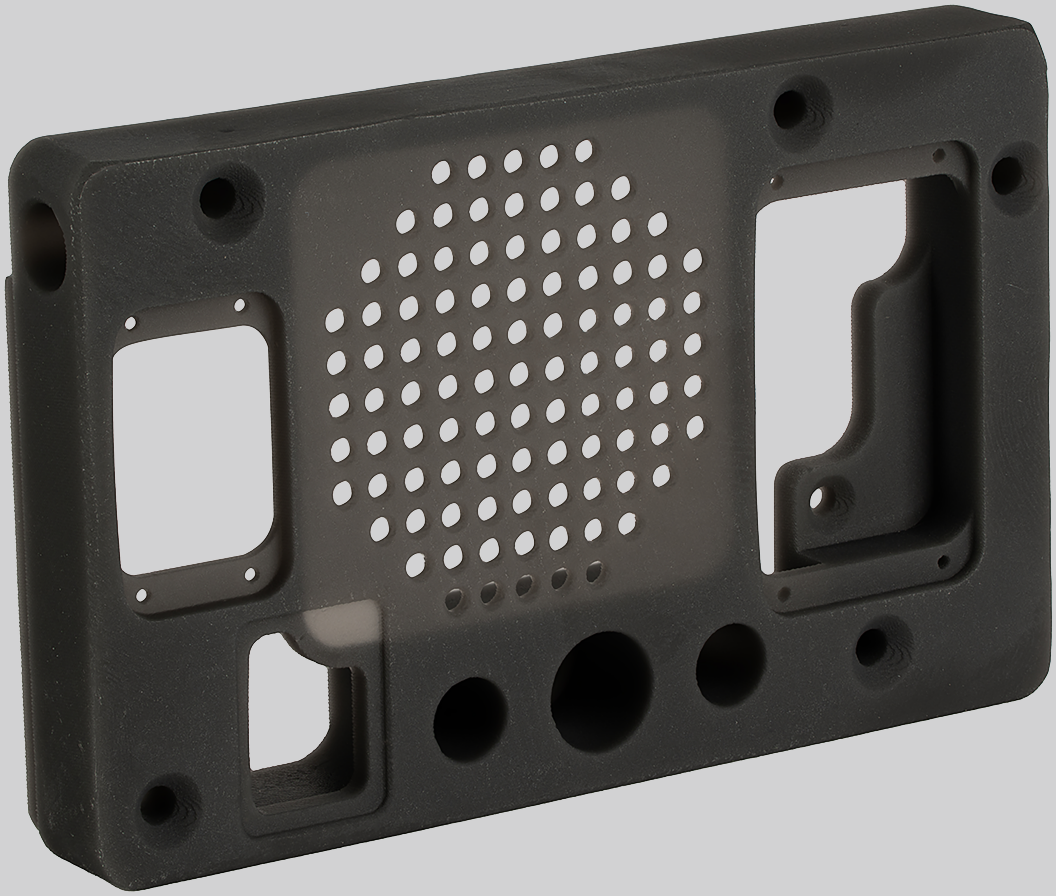
LOCTITE 3D 3843

December 2023

Material Best Practice Guide for Pro XL™, Xtreme 8K™, & Envision One™



ETEC

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History of Changes

Date	Changes	Revision
September 2022	Document creation	1.0
December 2023	■ Updated About LOCTITE 3D 3843 ■ Updated Getting Started ■ Updated Software ■ Updated Print Preparation ■ Updated Post-Processing	3.0

About This Guide

This document serves as a comprehensive guide to prepare parts, post-process, and finish using LOCTITE 3D 3843 material.

LOCTITE 3D 3843 Material Best Practice Guide: 81-00270-Rev03-EN, December 2023

About LOCTITE 3D 3843

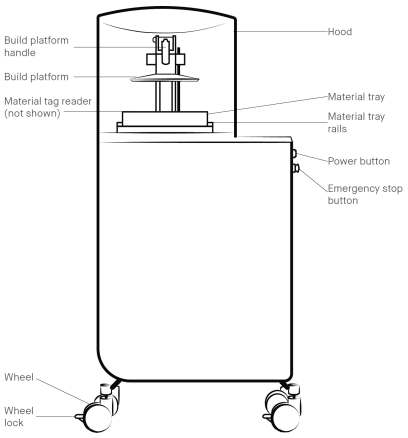
Identification

LOCTITE® 3D 3843 is an ideal material for end use parts production or functional prototyping. An ETEC-validated material from Henkel, LOCTITE 3D 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.

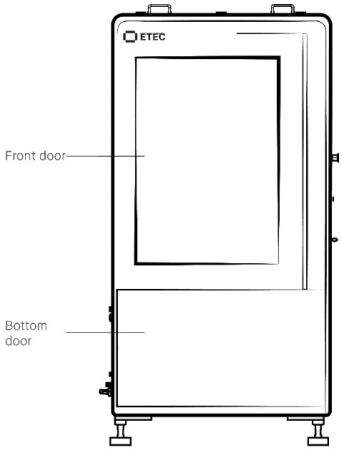
Applicable Printers

This material is tested and approved for the following printers:

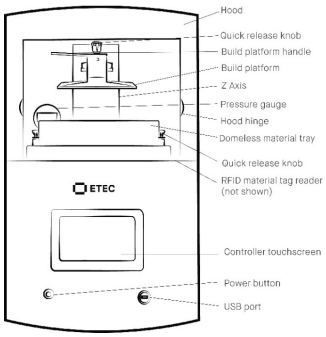
- Pro XL™
- Xtreme 8K™
- Envision One™



Pro XL Front View



Xtreme 8K Front View



Envision One Front View

Getting Started

Primary Supplies

Acquire primary supplies prior to product delivery. Obtain the proper tools to prepare for successful printing and post-processing.

The following supplies are required to print LOCTITE 3D 3843 material:

- LOCTITE 3D 3843: Product Code RES-01-7019 (1 kg), RES-99-1025 (5 kg).
- Personal Protective Equipment (PPE).
- Material mixing:
  - Xtreme 8K: Silicone mixing blade attachment and industrial mixing drill.
  - Pro XL, Envision One: Dual Motion Bottle Roller, Product Codes ACC-26-1000 (110V) and ACC-26-1000 (220V), and rubber spatula.
- Material filtering:
  - Xtreme 8K: 5-gallon bucket and paint strainer.
  - Pro XL, Envision One: Cone-shaped paint filter and spare material storage bottle.
- Part removal:
  - Xtreme 8K: Razor scraper.
  - Pro XL, Envision One: Paint scraper.
- Washing unit options:
  - Small parts: PWA 2000, Product Code ACC-22-2000.
  - Small, medium, and large parts: Desktop Orbital Shaker Washer, Product Code ACC-02-6000.
- Washing agent: 99% Isopropyl alcohol (IPA).
- Spray bottle.
- Air compressor.
- Curing unit options:
  - PCA 4000, Product Code ACC-06-1000.
  - Xtreme 8K only: UVCA 3000, Product Code ACC-02-1001.

Note: See Xtreme 8K Site Prep Guide, Pro XL Site Prep Guide, and Envision One Site Prep Guide for more information.

Design Parts for LOCTITE 3D 3843

Some parts printed in LOCTITE 3D 3843 must be printed on supports. Keep this in mind when designing parts for LOCTITE 3D 3843.

Add channels or drainage holes to hollow parts. This allows uncured material to drain from the hollow feature during the printing process.

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

Envision One Tip: Avoid parts with thin geometries.

Minimum Feature Size

Minimum feature size is dependent on:

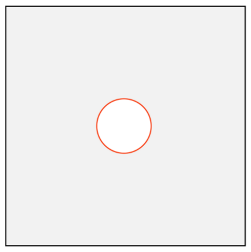
- Printer
- Material
- Feature geometry

All design features include recommendations for absolute minimum feature size and recommended minimum feature size. Absolute minimums are the smallest resolvable feature size based on printability. Recommended minimums are provided to minimize potential warpage and account for part fragility. Part feature dimensions that are lower than the recommended minimum can fracture with minimal force.

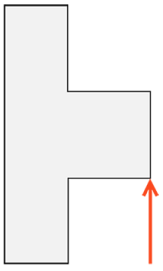
Note: Absolute minimum feature sizes are only valid for smaller features within the part geometry (text, small channels, etc.). They should not be used for the main components of design methodology.

ETEC recommends the following minimum feature sizes for parts printed in LOCTITE 3D 3843:

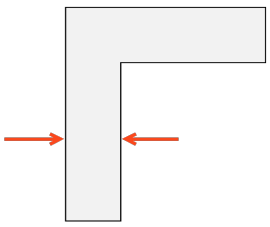
Design Feature	Pro XL Absolute Minimum	Xtreme 8K Absolute Minimum	Envision One Absolute Minimum	Pro XL, Xtreme 8K, & Envision One Recommended Minimum
Wall Thickness	0.40 mm	0.30 mm	0.40 mm	2.0 mm
Engraving Depth	0.30 mm	0.30 mm	0.30 mm	0.60 mm
Embossing Height	0.30 mm	0.30 mm	0.30 mm	0.60 mm
Positive Features	0.45 mm	0.45 mm	0.45 mm	0.90 mm
Negative Features	0.45 mm	0.45 mm	0.30 mm	0.90 mm
Hole Diameter	1.0 mm	0.60 mm	1.0 mm	1.50 mm
Unsupported Walls	0.30 mm	0.30 mm	0.30 mm	1.0 mm
Bridge Gap **Note:** The value is maximum, not minimum.	0.50 - 5.0 mm	0.40 - 5.0 mm	0.50 - 5.0 mm	0.70 - 2.0 mm
Unsupported Horizontal Overhang **Note:** The value is maximum, not minimum.	1.50 mm	2.0 mm	1.50 mm	1.50 mm



Hole Diameter



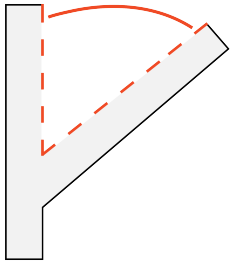
Unsupported Horizontal Overhang



Minimum Wall Thickness

Self-Supporting Angle

The absolute maximum self-supporting angle for parts printed with LOCTITE 3D 3843 is 70° from vertical (perpendicular to the build platform).



Self-supporting angle from vertical

The recommended maximum self-supporting angle on the Xtreme 8K is 60° from vertical. This means that parts at 60° or smaller angles may be printed without supports, but some deformation can occur.

The recommended maximum self-supporting angle on the Pro XL is 55° from vertical. This means that parts at 55° or smaller angles may be printed without supports, but some deformation can occur.

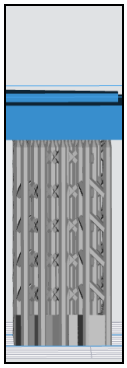
Software

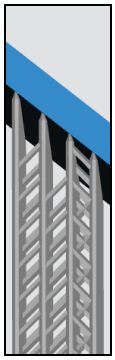
Orient Parts Envision One RP Software

Envision One RP Software 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.

	Pro XL	Xtreme 8K	Envision One
Spacing	Place parts a minimum of 1.50 mm apart.	Place parts a minimum of 0.30 mm apart.	Place parts a minimum of 1.50 mm apart.
Level at build platform	Place supported parts 4.0 mm from the build platform.		
Resolution	100 µm Z resolution (dependent on layer thickness).		

Tip: Supports are easier to remove when their main axis is oriented perpendicular (90°) to the surface of the part. As this angle is reduced, it becomes more difficult to remove the supports.

A. 

B. 

Two examples of a part supported in Envision One RP. The supports on example A are perpendicular to the part, which improves the support removal and finishing processes. The supports on example B are more parallel to the part, which makes support removal and finishing more difficult

Support Parts Envision One RP Software

Some approved applications require supports. Always use the LOCTITE 3D 3843.ini support file.

Tip: Large, thin, flat surface areas can be prone to cure stress/warpage during printing. To reduce warpage in parts during the printing process, orient the parts to minimize each surface area per layer from the beginning of the print, as parts allow.

Support Settings

Support Setting Feature	Pro XL & Envision One Recommended Support Settings	Xtreme 8K Recommended Support Settings
Minimum contact tip thickness	0.80 mm	0.50 mm
Minimum support beam thickness	1.75 mm	1.90 mm
Minimum support beam height	4.0 mm	10.0 mm
Minimum space between supports	1.50 mm	2.25 mm
Minimum support base	0.65 mm	0.50 mm
Clearance from part	1.60 mm	2.0 mm
Only from platform	Optional	Yes
Reinforcement spacing	3.0 mm	5.0 mm
Maximum angle	55°	60°
Maximum height	150 mm	500 mm
Base type	Baseplate	Fence

Print Preparation

Mix Material

LOCTITE 3D 3843 separates easily and must be mixed regularly.

Important: Parts printed on the Pro XL/Envision One and the Xtreme 8K have different mixing recommendations. Use the mixing recommendations for the printer in use.

Pro XL and Envision One

1. Mix the sealed material bottle on the bottle roller for 30 minutes.
2. Wait for bubbles to subside before filling the material tray.
3. Before every print, gently mix the material in the material tray for 1 minute with the rubber spatula.

Xtreme 8K

1. Shake material in the material container for 1-2 minutes. Wait for bubbles to subside before filling the material vat.
2. Before every print, mix the material in the material vat for 2-3 minutes at a gentle speed with the silicone mixing blade attachment on a drill.

Fill Material Vat/Tray

Do not overfill the material vat/tray. 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 Maintain Materials Pro XL, Maintain Materials Xtreme 8K, and Maintain Materials Envision One.

To add more material to the printer, carefully pour material into the material vat/tray between prints. See Add Material Pro XL, Add Material Xtreme 8K, and Add Material to Domeless Material Tray Envision One.

Note: Do not add material to the material vat/tray during a print. Adding material while the print is paused, or during a print, will cause a small shift line in the part.

Print LOCTITE 3D 3843

Before starting a print:

- Ensure the build platform is clean and free of cured material.
- Ensure the material level is correct.
- **Xtreme 8K only:** Check the build platform level.
- **Xtreme 8K only:** Check the recoating blade gap.

To start and complete the print, see the printer's Operations & Maintenance guide:

- Pro XL Operations & Maintenance Guide
- Xtreme 8K Operations & Maintenance Guide
- Envision One Series Operations & 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 & Pro XL 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

Materials Safety

Safety data sheets (SDS) for materials used in the printing process are available from ETEC or directly from suppliers. Read and understand the information provided in these documents prior to attempting to operate the printer or handle any media.

⚠ WARNING

Fire hazard: Some materials used for washing may be flammable. Do not wash parts in proximity of any potential ignition source. Washing or drying equipment must be approved for use with flammable solvents. Read SDS and contact your EHS Representative.

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.

Clean parts using one of the following cleaning options:

- **Small parts:** PWA 2000.
- **Small, medium, and large parts:** Desktop Orbital Shaker Washer.

Important: Do not expose LOCTITE 3D 3843 to alcohol for longer than five minutes. Excess exposure to alcohol may cause slight color change and/or surface deterioration.

Clean parts with the PWA 2000:

1. Remove excess resin from the parts using compressed air.
2. Wash the parts in the PWA 2000 with 99% IPA for 2.5 minutes on **High**.
3. Remove the parts as soon as the program is done and dry with compressed air for 20 to 40 seconds.
4. Repeat **Steps 2 - 3**.
5. If the surface of the parts is glossy after drying, spray with IPA and remove residue with compressed air. The surface should be matte and smooth.

Clean parts with the Desktop Orbital Shaker Washer:

1. Remove excess resin from the parts using compressed air.
2. Wash the parts in the Orbital Shaker with 99% IPA for 2.5 minutes at 100 RPM.
3. Remove the parts as soon as the program is done and dry with compressed air for 20 to 40 seconds.
4. Repeat **Steps 2 - 3**.
5. If the surface of the parts is glossy after drying, spray with 99% IPA and remove all residue with compressed air. The surface should be matte and smooth.

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

Dry Parts

Parts must be completely dry before post curing:

1. Dry the parts with compressed air.
2. Place the parts in a dark room on a clean surface lined with parchment paper.
3. Leave the parts to dry for 10 minutes.

Post Cure Printed Parts

Post cure parts using one of the following curing options:

- PCA 4000. See Programs and Features PCA 4000.
- **Xtreme 8K only:** UVCA 3000. See Hardware Operations UVCA 3000.

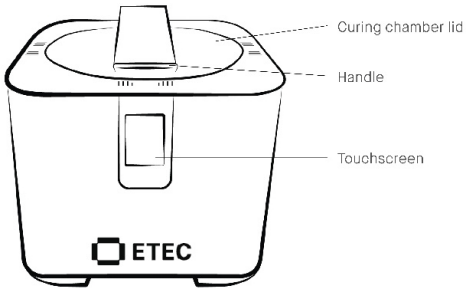
Important: Parts printed in LOCTITE 3D 3843 on the Pro XL, Xtreme 8K and Envision One have different curing instructions. Use the curing instructions that are compatible with the printer in use.

Cure parts with the PCA 4000:

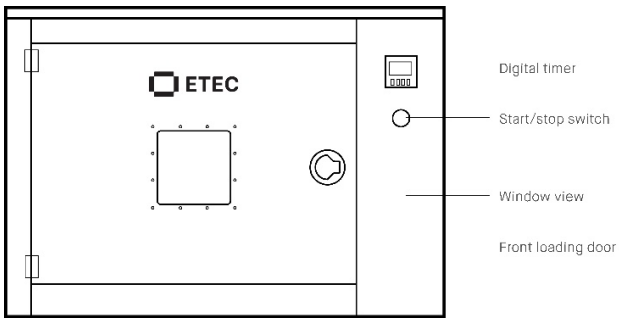
1. Place parts in the curing unit with as much space between parts as possible. Parts should never touch one another while curing.
2. Cure the parts in the PCA 4000 with the following settings:
   a. Pro XL and Envision One: 15 minutes at 20° C and 100% power.
   b. Xtreme 8K: 20 minutes at 20° C and 100% power.
3. When the cycle ends, let the parts cool completely before handling.
4. Flip the parts between cycles for an even cure.
5. Repeat **Steps 2-3**.

Cure parts with the UVCA 3000:

1. Place parts in the curing unit with as much space between parts as possible. Parts should never touch one another while curing.
2. Cure the parts in the UVCA 3000 for 60 minutes at 20° C and 100% power.
3. When the cycle ends, let the parts cool completely before handling.
4. Flip the parts between cycles for an even cure.
5. Repeat **Steps 2-3**.



PCA 4000 Front View



UVCA 3000 Front View

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