Crestaform® 3D

WHITE PAPER

Guide to Optimising LCD and DLP 3D Printer Settings

SCOTT BADER
Making a **positive** difference

INTRODUCTION

Achieving high-quality, reliable, and detailed results with your LCD or DLP 3D printer relies on finely tuning your machine's settings. Every printer - even within the same model - can differ in its light source power and intensity, so optimised settings for one may not suit another. This guide demonstrates an easy and effective method to help you dial in the best settings for your specific printer and resin, reducing failures and improving print quality.

Why Optimisation Matters

- **Better Print Quality:** Sharper details and smoother surfaces.
- **Increased Print Success:** Fewer failed prints and wasted materials.
- **Workflow Efficiency:** Save time and resin by “dialling in” settings faster.

Step-By-Step Print Setting Optimisation

1. Review Your Printer’s Specifications

- Check your printer: Printer model, type, light source wavelength, and power.
- **Tip:** Refer to your printer manual or manufacturer specs.

2. Prepare Your Printer

- Clean the printer’s screen and resin vat with isopropyl alcohol (IPA) to remove debris or residue.
- Level the build plate following your printer’s specific procedure.

Fill the resin vat until the vat line to cover the base film (FEP/PTFE).

3. Perform a Test Print

- Use a readily available print validation file for your printer or slicing software.
- **Tip:** Recommended to use Scott Bader RERF file (SB RERF) available on our website.

Configure initial settings:

- Set exposure times based on TDS.
- Burn-in exposure: Typically, is 5 to 10 times the regular layer exposure.
- Layer height: Conduct testing at the layer height you are planning to print your parts.

Tip: *You can find values for our products with the relevant Guides available on our website.*

Print, wash and cure:

- The model according to resin manufacturer guidelines.

Inspect:

- Look for hardness (should be solid, not brittle), dimensional accuracy, and surface finish.

4. Adjusting Exposure Time

Burn-in layer underexposed

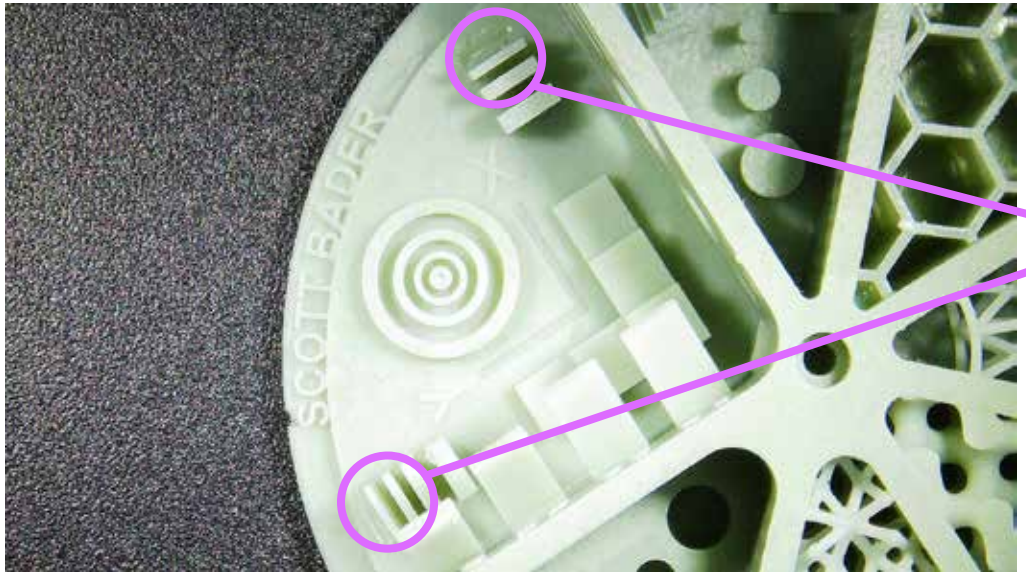
- Signs: No object stuck to build platform, material at the bottom of the vat.
- Solution: Increase exposure time in small increments (20%).

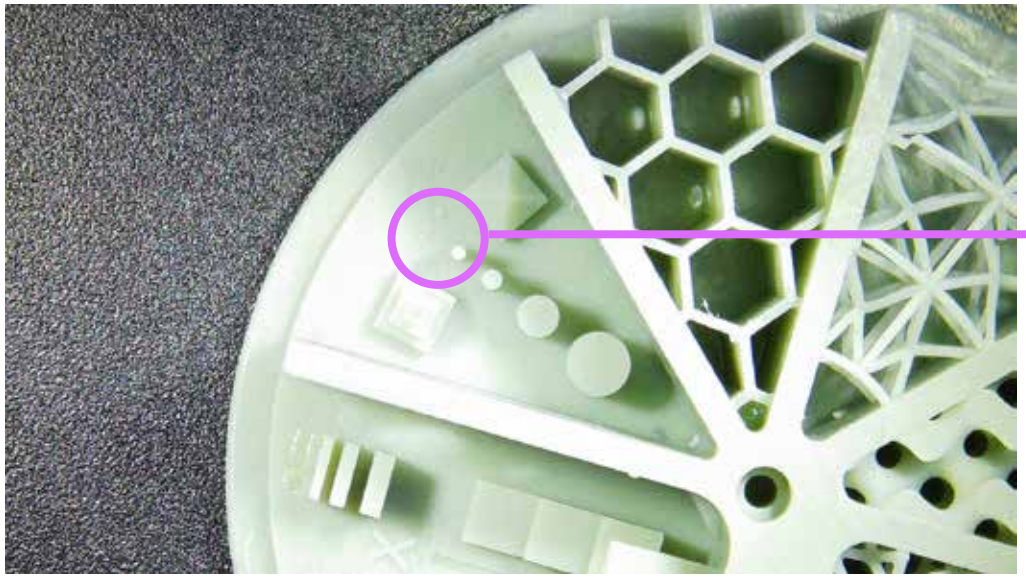
Burn-in layer overexposed

- Signs: Layers too thick, “elephant” foot, hard to remove
- Solution: Decrease exposure time in small increments (20%)

Normal layer underexposed

Signs: Sticky, soft, or uncured prints, poor positive feature build up e.g. thin features don’t form or are deformed, bridge structures drooping.
Solution: Increase exposure time in small increments (10%).



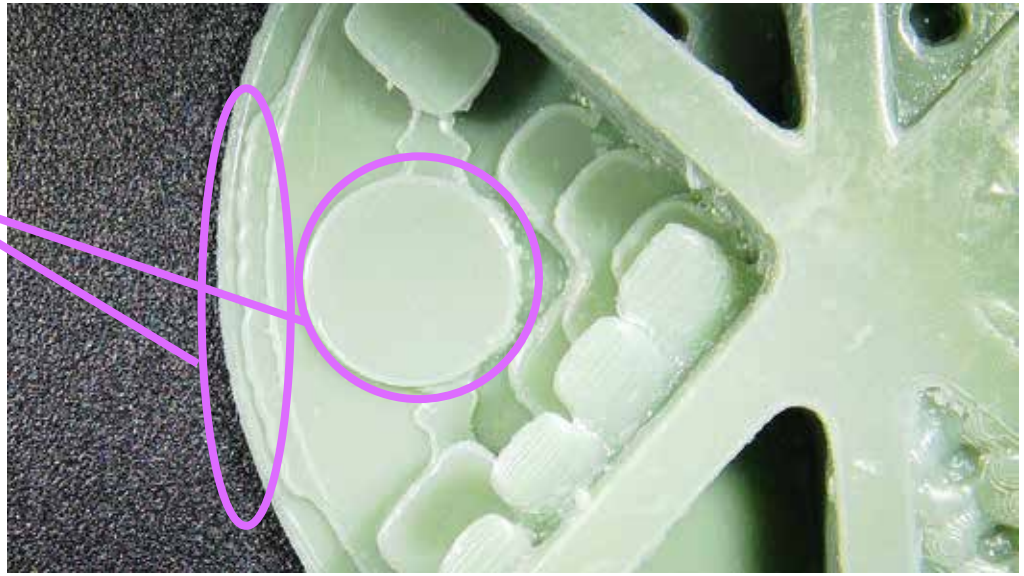


Normal layer overexposed

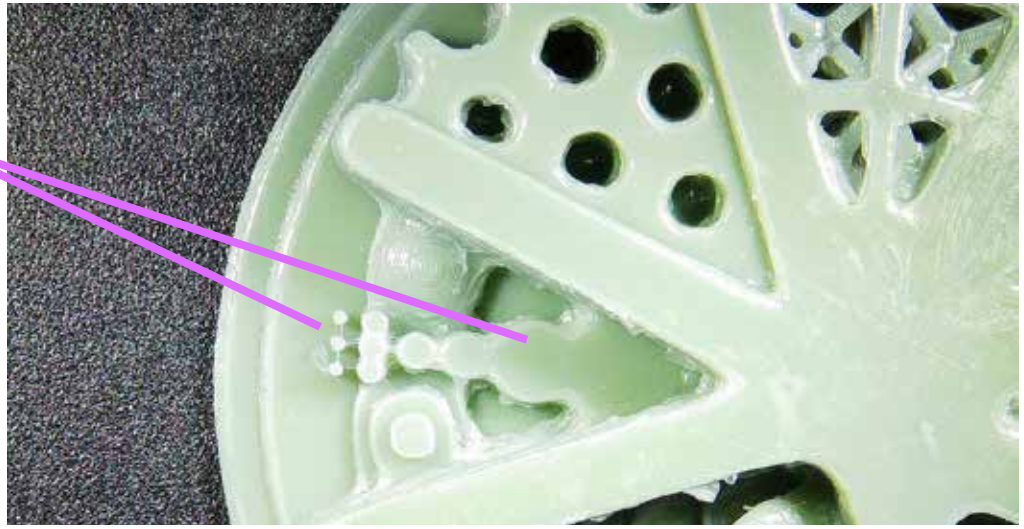
Signs: Brittle parts, hard to remove, poor negative feature build up e.g. horizontal voids/ holes are poorly formed, poor definition and blurred margin lines.

Solution: Increase exposure time in small increments (10%).

Loss of detail, merging of detail into single mass



Loss of detail, merging of detail into single mass



5. Fine-Tune Other Printing Parameter

Layer height:

- Test 0.02–0.20 mm.

Tip: *Thinner layers = more detail, thicker layers = faster prints.*

Tip 2: *Small layer heights (0.02 - 0.05 mm) are typically suitable for parts requiring extreme detail e.g. figurines, jewellery, microfluidics etc. and larger layer heights (0.10 - 0.20 mm) are suitable for large prints or prints where speed is prioritised over fine detail.*

Lift speed & distance:

- Adjust to balance print speed and quality; slower speed and larger distances are necessary for larger prints to help reduce suction forces and allow the uncured resin to drain.

Tip 3: *Slowing down lift speeds can help with peel forces and prevent delamination/ print failures. Increasing lift distance is mainly done to ensure parts release from the FEP before another layer is printed. Both have the detriment of increasing print time, so a balance is required.*

Wait times

- A wait-after-retract/wait-before-print time is recommended for all resins (1-2 seconds) to allow resin flow to stop before exposure begins. Phenomenon such as blooming, which appears as rough/tacky surfaces can occur if insufficient wait before print time is used. A wait-before-retract/wait-after-lift time is recommended for high viscosity resins which require more time for resin relevelling.

Anti-aliasing

- Try different settings (if supported) for a smoother finish but watch for loss of fine detail.

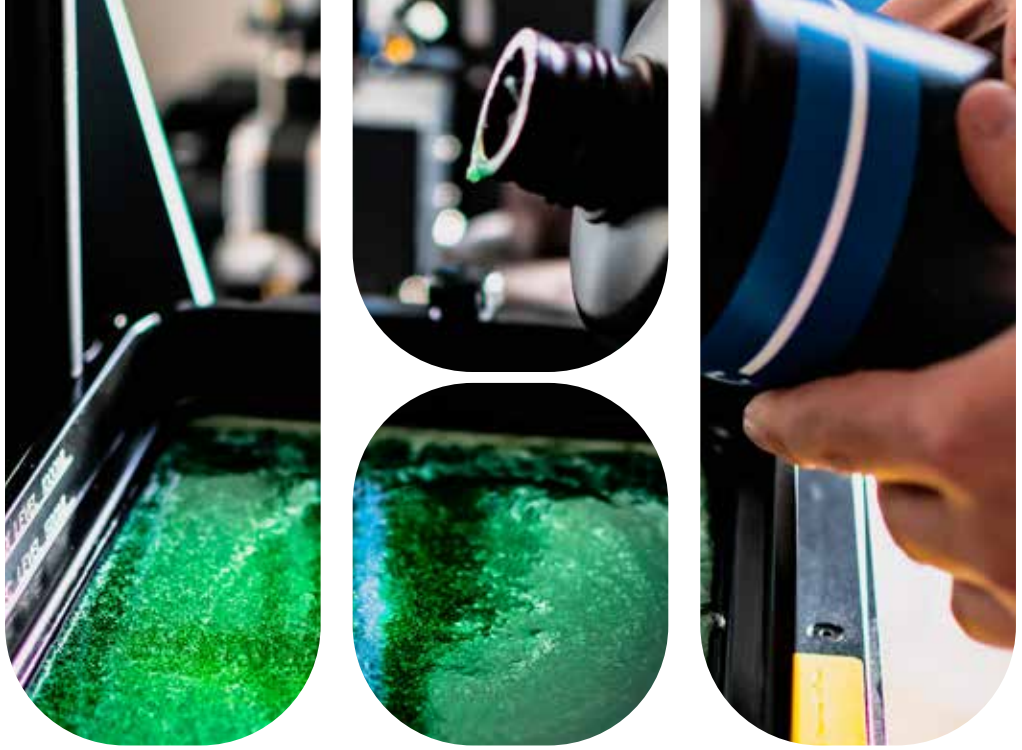
6. Save Your Optimised Settings

- In your slicing software, create and save a profile with your ideal settings for each printer-resin combination.

7. Maintain Consistent Printing Conditions Temperature & humidity

- Keep your printer environment steady for best results.
- Shake bottle before each print to distribute pigments evenly. Remix with a suitable utensil if left in vat/tray.
- Check the FEP film: Replace if scratched, punctured or cloudy to maintain print quality.
- Re-test: Always repeat calibration if you change resin, printer, or print environment.

Tip: *If you haven't printed for a while, or if you begin to experience unexplained print failures after a lengthy period of printing, we recommend to always check and recalibrate your print settings.*



Additional Tips & Recommendations

Keep a print log

- Record changes to settings, resin types, and results for easy troubleshooting and repeatability.

Get inspired

- Join online user groups or forums for your specific printer model for tips from other users.

Maintenance matters

- Regular upkeep (cleaning, checking wear parts) prolongs printer longevity and consistent performance.

Download recommended test files

- Check our website for the Resin Exposure Validation File.
- Check our website for our Product Guidelines which include settings information.

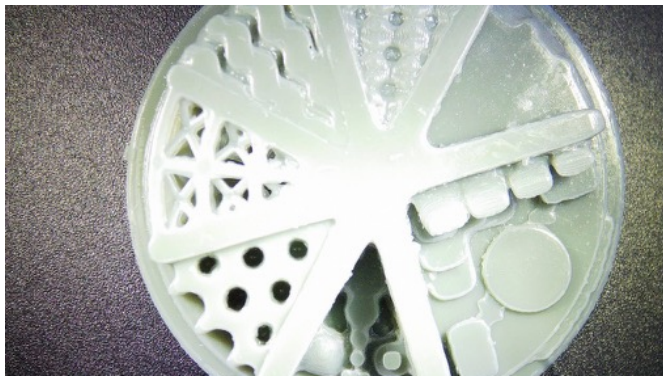
APPENDIX

Quick Start Checklist

STEP	COMPLETED
Checked printer specification	
Cleaned screen & vat with IPA	
Levelled build plate	
Filled vat with enough resin	
Selected and loaded a test file	
Set exposure & other resin parameters	
Performed test print	
Washed & cured test print	
Inspected model for detail/accuracy	
Adjusted exposure/ parameters as needed	
Saved final setting in slicing software	
Recorded result in print log	

Underexposed, overexposed and opimised RERFs

Underexposed RERF



Overexposed RERF

Optimised RERF

Troubleshooting Guide

Problem	Possible Cause	Solution
Print doesn't adhere to build plate	Build plate not levelled, insufficient exposure	Re-level the plate, increase bottom exposure time
Print is soft/ sticky	Underexposed, insufficient	Increased normal exposure time, check curing process
Parts are brittle/ too hard	Overexposed	Reduce exposure time in small increments
Loss of detail/ blurry prints	Overexposed or anti-aliasing too high	Decrease exposure, reduce anti-aliasing in slicer
Warping or layer separation	Inconsistent environment/ rapid layer changes	Print in stable temps, consider lower lifting speeds
Print stuck to FEP	Bottom layers overexposed, FEP worn	Lower bottom exposure, inspect/ replace FEP
Cloudy or lines in prints	Dirty vat/screen or unmixed resin	Clean vat/ screen, mix/ shake resin before printing

Sample Print Log Template

Date	Printer Model	Resin Used	Layer Height	Exposure (bottom/normal)	Test Result/ Notes
2025-07-16	Mono X	Grey Resin	0.05mm	30s/2.5s	Good accuracy, soft base

SUMMARY

Regularly optimising your 3D printer's settings ensures the highest print quality and reliability, reduces waste, and helps you get the most from your printer and materials. By following this guide, even new users can confidently fine-tune their printer and unlock the full potential of LCD/DLP resin printing.

READY TO GET STARTED ?

Try our recommended test prints and contact our team for tailored advice or help with setup!

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