

LIQCREATE



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User's guide Liqcreate® Strong-X

Liqcreate Strong-X is an opaque high strength engineering photopolymer for SLA and DLP technologies in the range of 385 - 405nm. Liqcreate Strong-X is one of the strongest materials available in the market. Its flexural strength of 135MPa is comparable to industry's leading dual-cure cyanate ester resins. Liqcreate Strong-X is easy to use on all open source SLA and DLP 3D-printers and only requires UV post-curing. This material has excellent features like high strength, high stiffness and high temperature resistance which makes it ideal for injection molding and heavy duty applications.

This User's Guide provides useful information to get the best experience from our product Liqcreate Strong-X. This includes handling of the materials, safety and parameters for several 3D-printers.












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1. General information

Liqcreate Strong-X is our product in the engineering photopolymer family. This User's Guide contains useful information to get started with this resin. The table below explains all signs on the label. Safety signs and instructions are mentioned in chapter 6.

Label Signs	Definition
	Liquid waste and contaminated towels should be treated as chemical waste
	Keep bottles and resin out of direct (sun) light
	Resin and packaging should not be stored below 5°C or above 30°C for a longer period
1000GR 250GR	This bottle contains 1000 grams or 250 grams of liquid resin when unused
	This resin is designed to be printed at 25 to 100 micron layer thickness. More information on printing parameters is mentioned in chapter 4
	Shake bottles properly before use.
	This resin is designed to be printed on both SLA (laser based) and DLP (projection based) 3D-printers. Ideally within the range of 385-405nm
	The special feature of this resin is its extreme high strength

2. Resin Handling

Shake the bottle for at least 2 minutes before use. After shaking leave the resin to rest for 10 minutes to let air bubbles escape. The resin can be poured back into the bottle after use, our liqcreate scraper is the perfect tool for this. Check the resin for residual pieces of polymer before pouring back the resin in the bottle. Always use protective measurements when handling Liqcreate resins. Extended safety instructions can be found in chapter 6.

3. Compatibility 3D-printers

Liqcreate Strong-X is a photopolymer designed for SLA and DLP technologies in the range of 385 to 405nm. Several 3D-printers have pre-defined settings, explained in the next chapter. If your 3D-printer is not in this list, please contact our experts at info@liqcreate.com

4. Build parameters

In this section the 3D-printing parameters of Liqcreate Strong-X are described. Several 3D-printers are already compatible with Liqcreate Strong-X, these include the Form2 and Miicraft125y machines. Contact our experts at info@liqcreate.com for optimization on other 3D-printers.

4.1. Form2

Set your machine in "Open Mode" by selecting "Settings" in the menu followed by enabling "Open Mode". Select one of the following settings for printing with Liqcreate Strong-X on the Form2:

- Grey V3 25 micron
- Grey V3 50 micron
- Grey V3 100 micron

Standard Grey V3 support settings can be used to print with Liqcreate Strong-X. Several features won't work in "Open Mode", this includes automatic filling, the wiper, heated resin tray and the machine stops every 100ml for a refill. Liqcreate Strong-X can be printed in "Open Mode", even though these options are disabled.



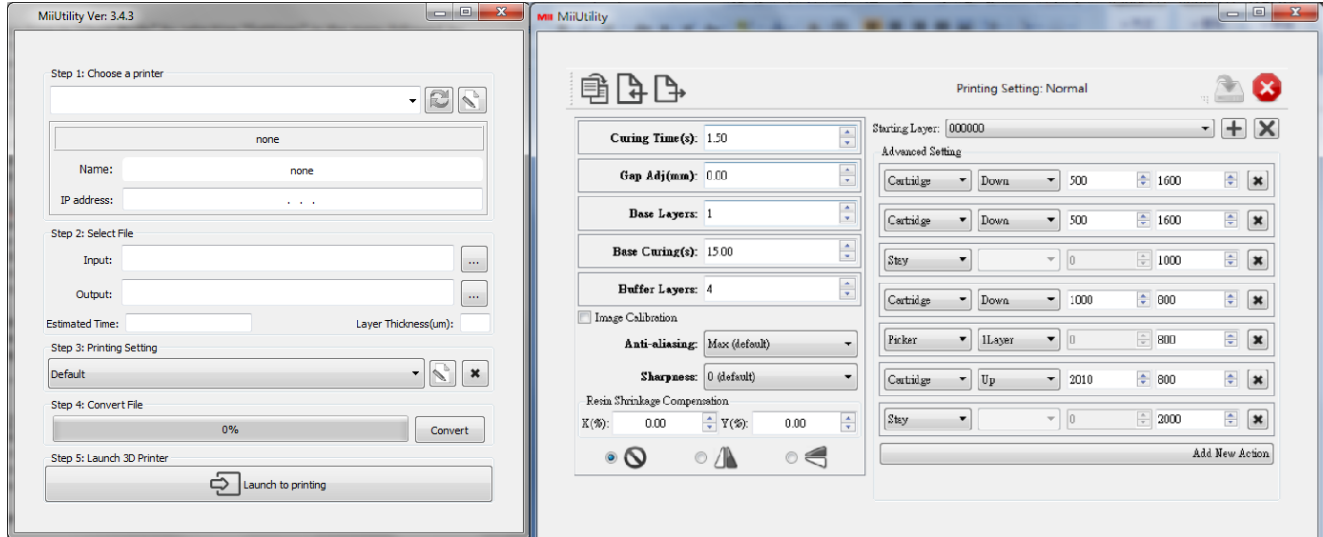
Liqcreate advises to print at 100 micron layer thickness for all regular prints. Specific high-detail prints can be printed at 25 or 50 micron layer thickness. Be aware that the PDMS resin tray will cloud after 1 - 3 kg of printed resin at 100 micron layer thickness. Resin tray lifetime significantly decreases when printing in 25 or 50 micron layers. Clouded resin trays will negatively influence print quality. Use a new resin tray if your tray is too clouded.



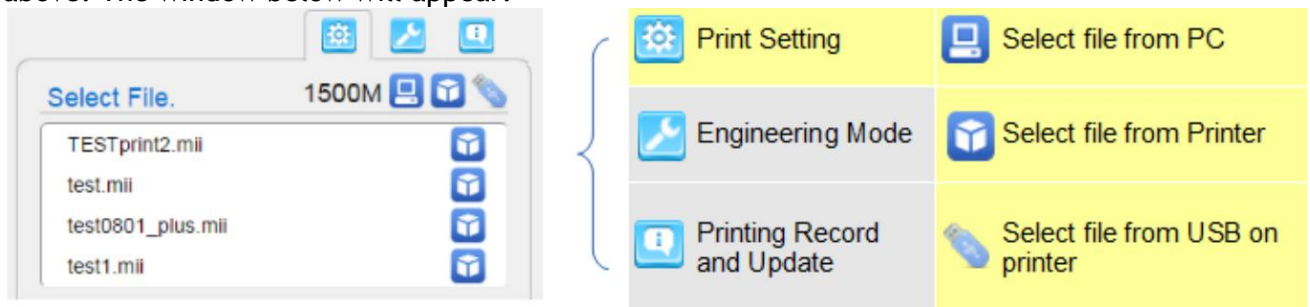
Don't store Liqcreate Strong-X in PDMS resin trays for extended periods. Resin tray might swell and the PDMS will separate from the plastic bottom. This will not happen in high-quality resin trays.

4.2. Miicraft 125y

First download the print parameter file from www.liqcreate.com/support/technical-documents to use Liqcreate resins on the Miicraft 125y 3D-printer. Open MiiUtility, then go to print and click on the “Edit printing setting file” which can be found in “Step 3 Printing Settings. In “Edit printing setting file” you can import the Liqcreate parameter files for both 50 and 100 micron layer thickness.

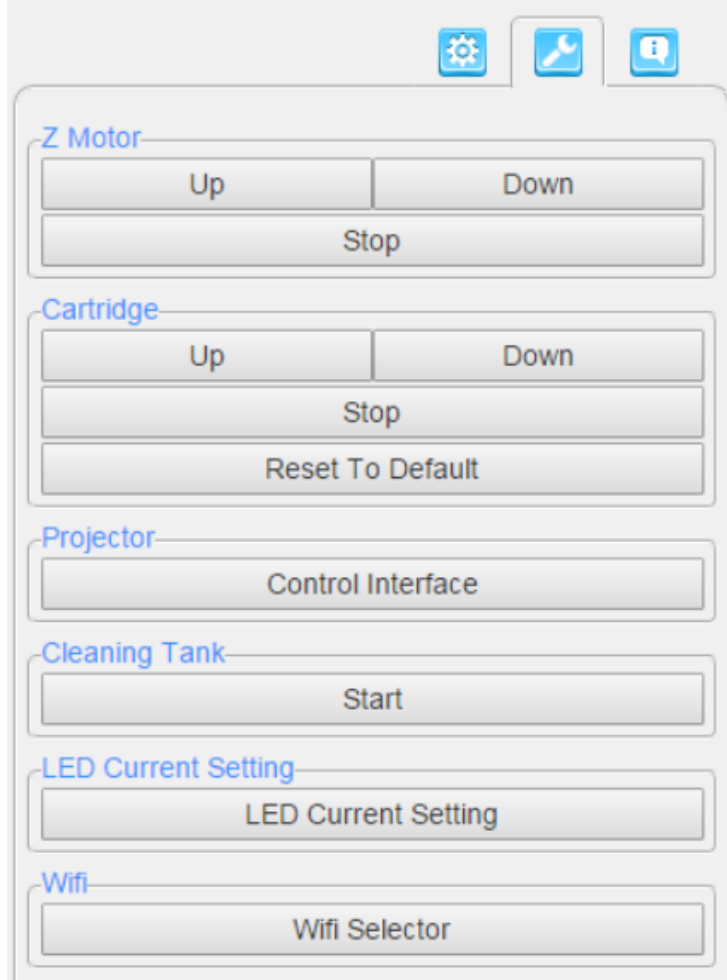


The last step is to modify the printers LED power. This can be done by entering the machine's IP-address in your browser or by clicking “Launch to printing” in the window above. The window below will appear.



Select engineering Mode. This will activate the window on the next page.

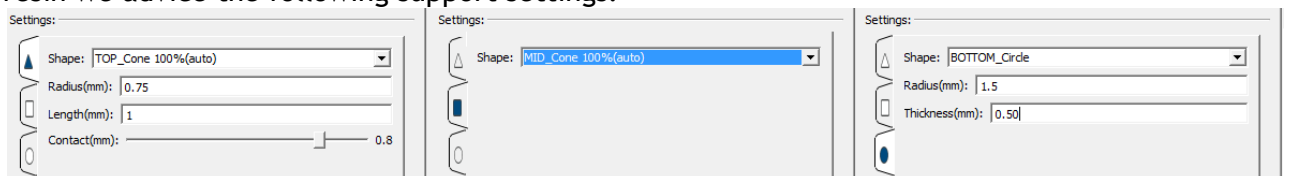
Change the LED current to 3.5A. Note the current that was displayed before so you can change it back when needed. The software will often display 3.49A after saving.



Now you are set to print with Liqcreate Strong-X. Select the following settings when printing with Liqcreate Strong-X:

- Liqcreate Strong-X 50 micron
- Liqcreate Strong-X 100 micron

It is important to modify the support settings before printing parts. For our Strong-X resin we advice the following support settings:



The high-quality Miicraft125 resin tank will cloud remarkably slower compared to the Form2 PDMS resin tank. The resin tank is also better resistance against Liqcreate resins, which makes it possible to store resins in a covered Miicraft125 resin tray for a month. Make sure that the film under the resin tray is in good condition before storing resins.

5. Post-processing

Post-processing is advised to get the optimal properties out of your prints. This includes rinsing 5 minutes in IPA or (Bio) Ethanol, preferably ultrasonic or under agitation. Make sure the parts are dry before post-curing, this could be done by placing the parts in a well ventilated area for at least 30 minutes or use pressurized air for 2 minutes. The last step includes curing in a high-power UV curing chamber for 15 minutes at 65 degrees Celsius. Preferred wavelength of the curing unit should be between 300-410nm.

Caution: Green parts could break or crack if they are exposure to solvents (Bio)ethanol, IPA) for longer than 20 minutes.

! **Caution:** Green parts need to be completely dry before post-curing. Curing wet and or sticky parts can lead to parts with surface defects.

Caution: Using a low-power curing unit can lead to inferior part properties

Caution: Always use proper protection (Chapter 4). Parts are save to touch without gloves after proper post-curing.

5.1. Spill cleaning protocol

Spilled resin can be cleaned with standard rinsing solvents like (Bio)Ethanol or IPA. Treat towels with resin as chemical waste.

6. Safety

Liqcreate liquids and green parts should always be handled with care. Using the advised precautions like gloves, glasses and protective clothing. Dispose all safety items that have been in contact with liquid resin as chemical waste. Inform the Safety Data Sheet for more information.

7. Storage and transport

Liqcreate liquids should be stored in the original package in a dark and dry area between 5 and 30 degrees Celsius. Close the packaging after every use. For transport the liquids should not be exposed to temperatures above 60 degrees Celsius to ensure the expiry date.

8. Plastic and Packaging Waste

Fully polymerized Liqcreate products can be treated as plastic waste and are not harmful for the environment. Liquid residue (washing solvent and contaminated papers included) should be treated as chemical waste and disposed as such.

Aluminum packaging can be cleaned by rinsing it with IPA or (Bio)Ethanol and disposed for recycling. Cardboard packaging should be disposed at a recycling point.