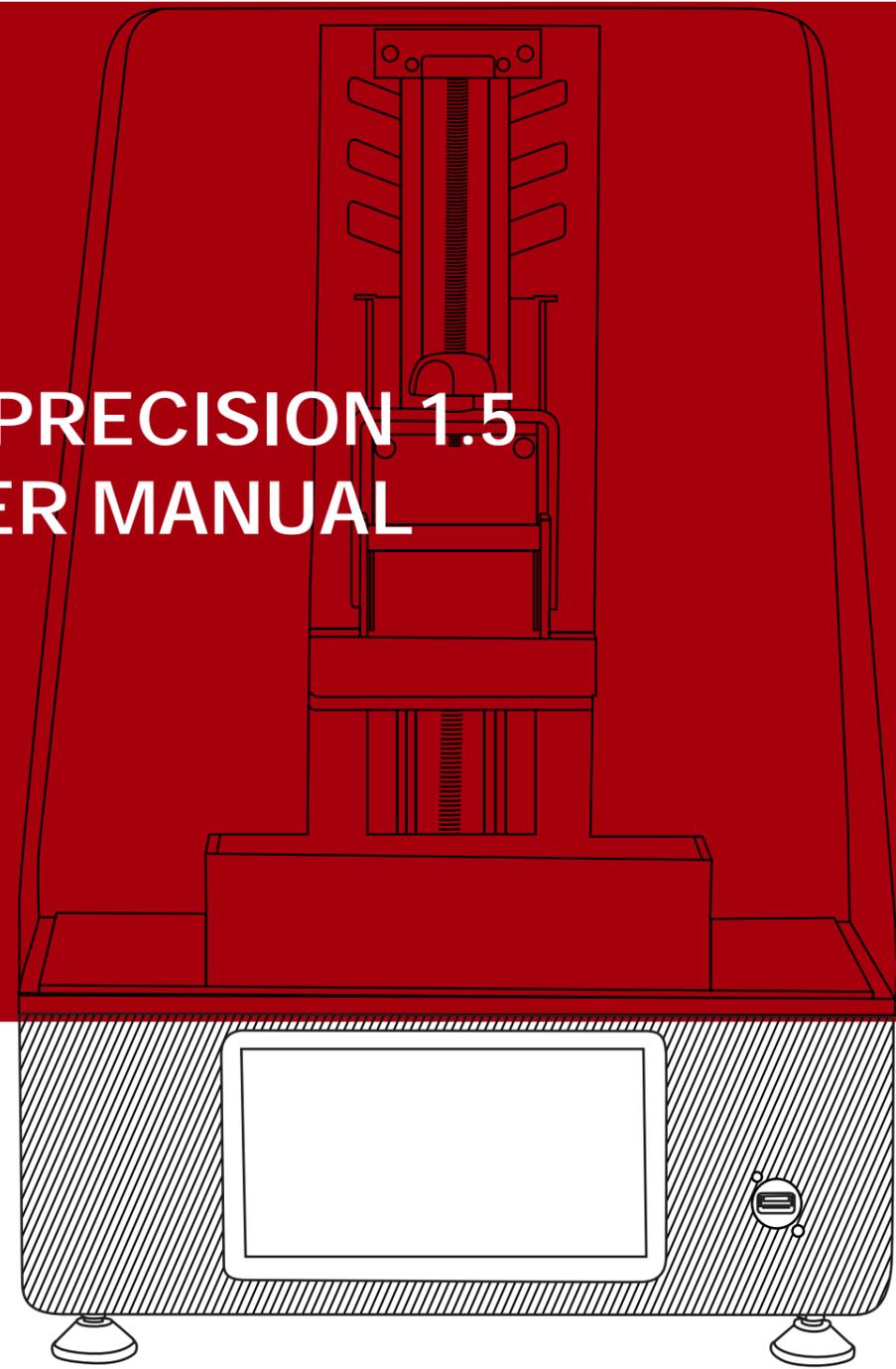THE NEXT GENERATION
OF 3D PRINTING
IS HERE

LC PRECISION 1.5
USER MANUAL

DISPOSAL INSTRUCTIONS
Do not throw this electronic device into the waste when discarding. To minimize pollution and ensure utmost protection of the global environment, please recycle or return to Photocentric for recycling.

UK
Cambridge House, Oxney Road
Peterborough PE1 5YW UK.
info@photocentric.co.uk
www.photocentricgroup.com

USA
2205 West Parkside Lane, Phoenix,
85027, AZ USA

Liquid Crystal
Precision 1.5

LC Precision 1.5
USER
MANUAL

Liquid Crystal
Precision 1.5

Contents

EU DECLARATION OF CONFORMITY

LIQUID CRYSTAL 3D-PRINTER

Model: LC Precision 1.5

We hereby declare that the product above is in compliance with the essential requirements of the following:
Low Voltage (LV) Directive 2009/95/EC, 2014/35EU. Electromagnetic Compatibility Directive(EMC), 2004/108/EC,2014/30/EU.
Restriction of the use of certain hazardous substances (RoHS) Directive, 2011/65/EU Commission Regulation (EU) No. 453/2010 and IEC 60950-1 Safety of ITE

Technical Documentation is stored at the manufacturer's address above.

Date of Issue: 15. January 2018
Place of Issue: Peterborough

Amanda Keating
Director

Manufacturer
Photocentric Ltd
Cambridge House, Oxney Road
Peterborough, PE1 5YW, UK
Year of CE Marking: 2018

CE

USER MANUAL

NEW DAYLIGHT TECHNOLOGY
HIGH RESOLUTION
3D PRINTER

Congratulations!
You have just purchased a new type of 3D printer using Daylight Polymer Printing (DPP) technology. This is a patent applied-for method of image creation that hardens liquid with the normal visible light emitted from an LCD screen. This revolutionary system is a new method of Additive Manufacturing that uses the same intensity and part of the spectrum that we use to see. This is the energy providing source that initiates the free radical or cationic polymerisation necessary to change the liquid photopolymer resin into your hardened object. Unlike UV, the visible light emitted from the screen is safe for viewing. These are some of the advantages of DPP technology:

SAFETY INFORMATION

Read the instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product. Observe the following guidelines when connecting and disconnecting power to the external power supply unit:

- Install the power supply unit before connecting the power cord to the AC power outlet.
- Unplug the power cord before removing the power supply unit from the printer.
- Operate on a table or flat, stable surface, ensuring that the machine cannot fall and is level.
- Do not operate outdoors.
- Do not allow resin or any liquids to get inside the chassis, wipe up any liquid spills immediately.
- Disconnect the printer from AC before storage or when not used for a long period of time. This 3D printer is connected to the electrical network with an input of 110 or 240 V AC, 50/60 Hz, and has an operational voltage of 48 V.
- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord.
- If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
- Do not overload a power outlet, strip or receptacle by plugging in too many devices.
- Use the product only with the supplied power supply cord set. If you need to replace the power cord set, make sure that the new power cord meets the following requirements: detachable type, UL listed/CSA certified, VDE approved or its equivalent, 4.5 meters (15 feet) maximum
- In case of malfunction, disconnect the printer immediately from network.
- Do not attempt to fix this product by yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all repairs to qualified service personnel. Please send an email to your national supplier or contact technical service at:
info@photocentric.co.uk
Unplug this product from the wall outlet and refer servicing to a qualified service personnel if:
- The power cord or plug is damaged, cut or frayed.
- Liquid has been spilled in the machine.
- The machine was exposed to rain or water.
- The machine has been dropped or the case has been damaged.
- The machine does not operate normally after following the operating instructions.

SAFETY GUIDELINES

IRRITANT

- Keep the printer and resins out of the reach of children.
- The resin is an irritant to skin and eyes. Always wear gloves when coming into contact with the liquid resin. Always use in a well ventilated room.
- Resins are classified as irritants, not harmful, but in exceptional circumstances people can be sensitive to the resin and develop a skin irritation or rash. Avoid this possibility by always wearing gloves and avoid breathing fumes.
- The printer should be operated on a stable and level surface, preferably away from direct ambient light.

Please note that the latest instructions will always be available from:
www.photocentricgroup.com/support

DISPOSAL INSTRUCTIONS

Do not throw this electronic device into the waste when discarding. To minimise pollution and ensure protection of the environment, please recycle or return to Photocentric for recycling.
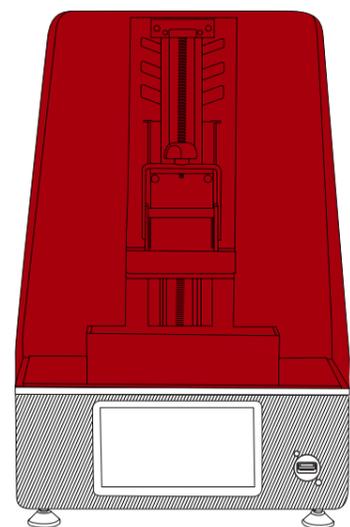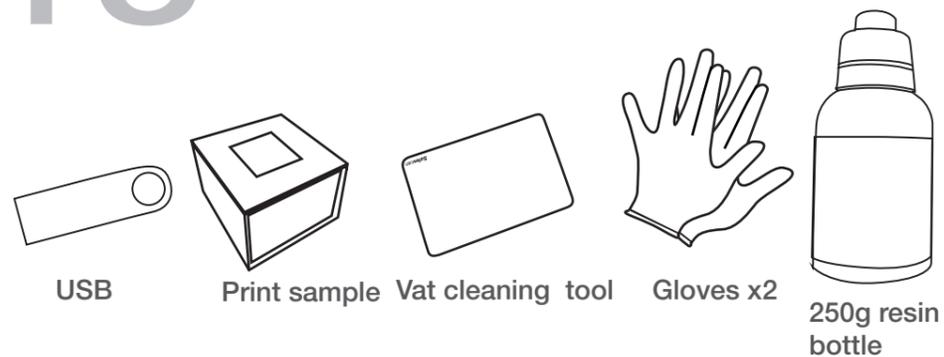
CON TENTS

The box contains

USB

Print sample

Vat cleaning tool

Gloves x2

250g resin bottle

Liquid Crystal Precision 1.5 with red hood.
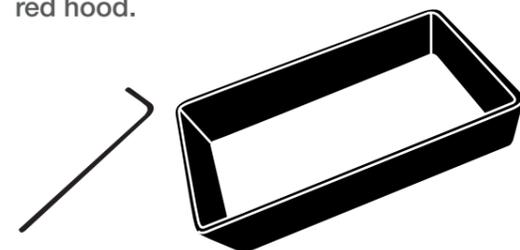
Spray Bottle
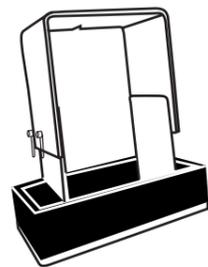
Scraper
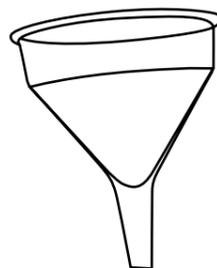
Funnel
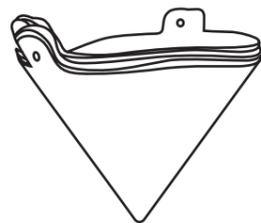
Paper resin filters
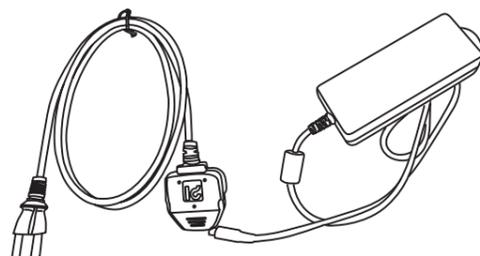
Allen Key

Disposable vat

Platform (assembled)

AC cable

Converter

MINIMUM COMPUTER REQUIREMENTS

- Operating System Windows 7, 8 or 10
- Minimum 2.0 Ghz processor speed 2 cores (recommended 4 cores)
- GPU capable of opening opengl version 3.0 or higher.
- _net framework version 4.0
- 64bit system: minimum 2GB of RAM, recommended 4GB
- 32bit system: minimum 1GB of RAM, recommended 2GB

Your perpetual Photocentric Studio license is stored on the provided USB stick. Please visit Photocentric Studio webpage to install and activate your software.

RECOMMENDED ITEMS

- Extra gloves.
- Paper towels.
- Access to a sink with hot water to clean the object.
- Liquid Soap (detergent) to clean the object.
- Glass or clear plastic container to post expose the object in.
- Air gun and air compressor (Optional)
- Photocentric Resin Cleaner to clean the product (Optional)

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1. INSTALL

1.1 PRINTER SET-UP

1. Take printer box out of the corrugated outer by lifting the handle holes at the sides. Open the box and carefully remove the printer. Do not pull the printer out by the linear drive / z- axis. Lift from below the base.

2. Place the printer on a flat work area. The printer should stand level and stable on four feet. If not, you can easily adjust the height of the legs by using a spanner size 13.
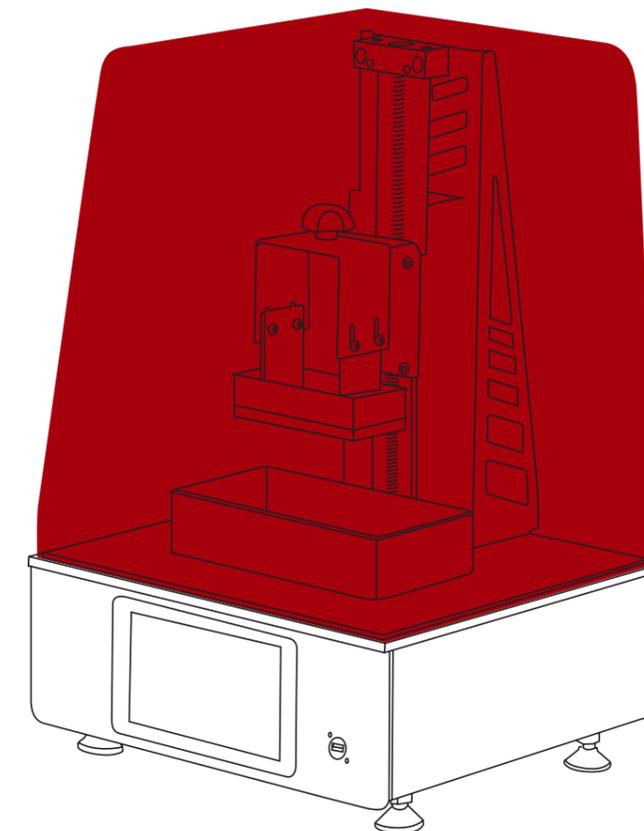

3. Take the power cable and push it into printer power socket until it clicks. Then please connect the power supply to a wall socket.

4. Turn on the printer by using the rocker switch at the back of the printer.

> **Note**
> ***To unplug the printer*** *from the power, first unplug the power cord from the wall socket. Wait for 10 minutes to allow full discharge (small blue LED light on the power supply should go off), then disconnect the plug from the printer.*
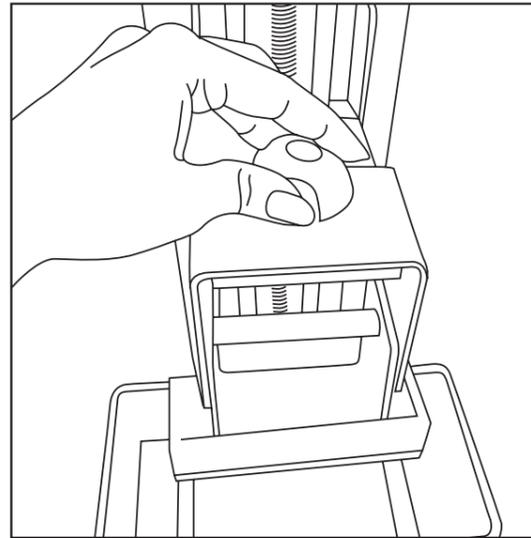
> **Note**
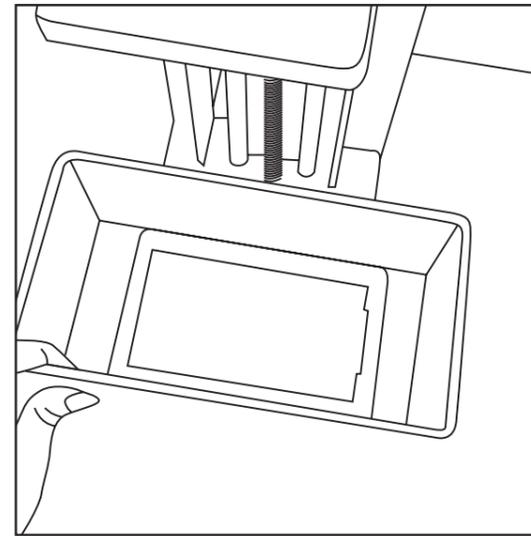> *If you want to remove the cable, you need to hold the collar and pull it back.*

Click
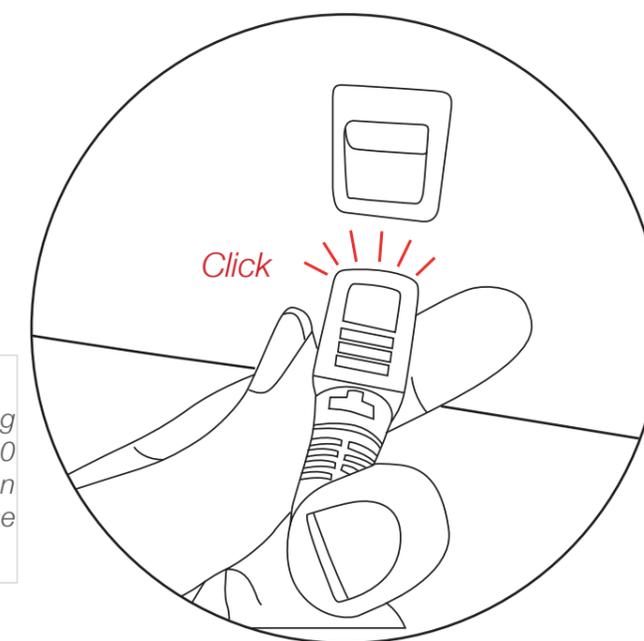
5. Take the pre-homed platform from the accessory box, unpack completely, slide it over the arm and tighten the knob.
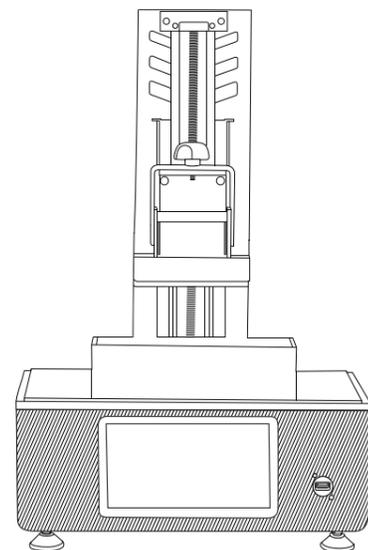

6. Take one vat from the accessory box, unwrap carefully, and place it centrally over the screen.

Note
DO NOT remove the protective film covering the screen. In the event of any resin spillage clean with a damp and soapy cloth. If you damage the film, replacements are available from Photocentric or your reseller.


7. Your printer is all set and ready to use!

1.2. PHOTOCENTRIC STUDIO SOFTWARE SET-UP

1. Please refer to the Photocentric Studio manual to install software and activate your license.

2. Select LC Precision 1.5 and select your resin profile then press apply.

3. Open your STL, OBJ or P3D file or files. Orient and support them as you wish. In order to achieve the highest accuracy with LC Precision, we recommend locating parts 5mm from the build platform.
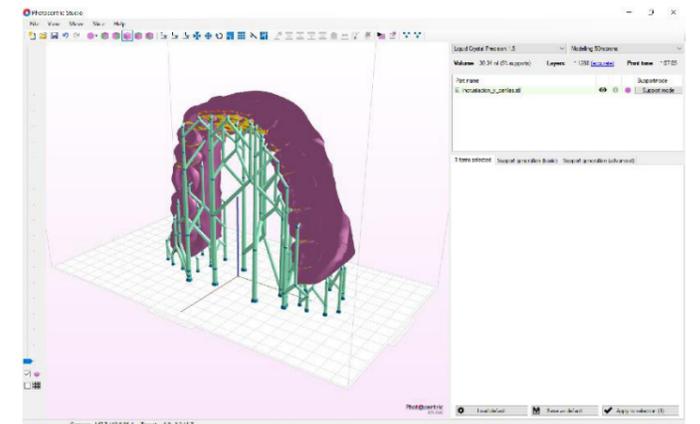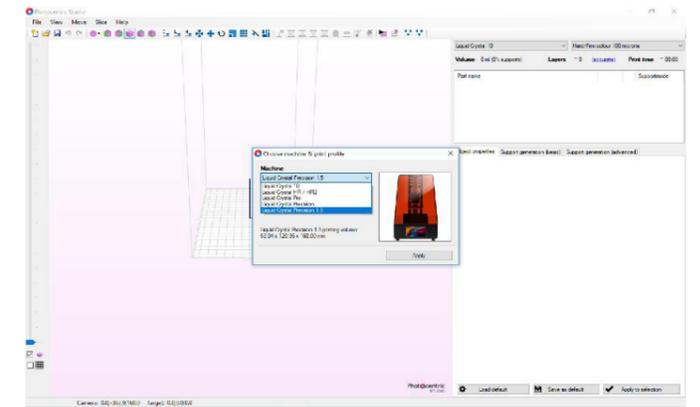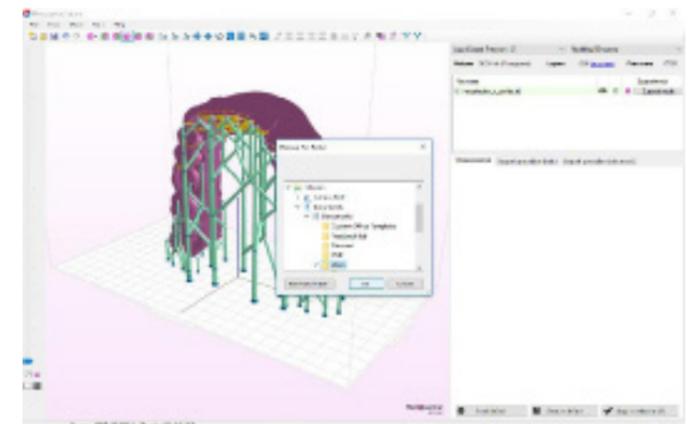

4. If you wish you can reselct another resin profile before slicing.
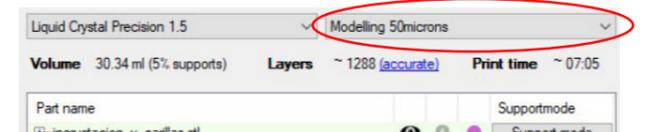
5. Press the Slice icon

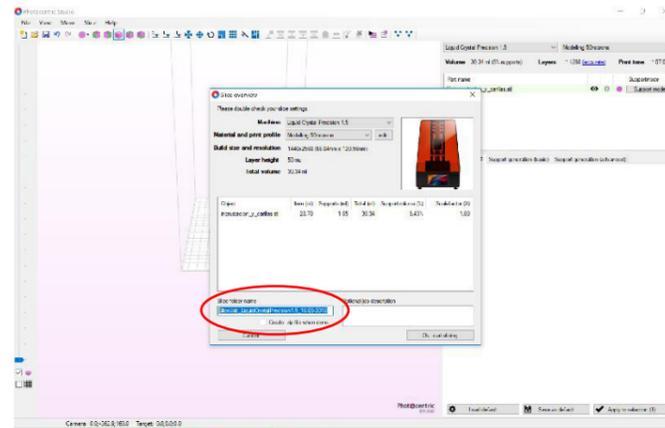6. Select your preferred location to save the sliced file
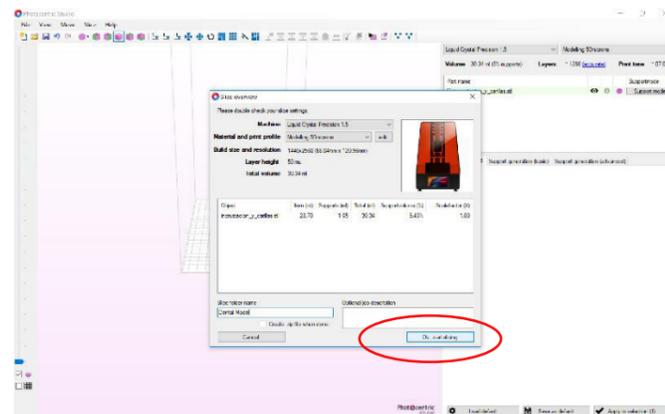
7. You can change your sliced file name in the pop-up window if required.
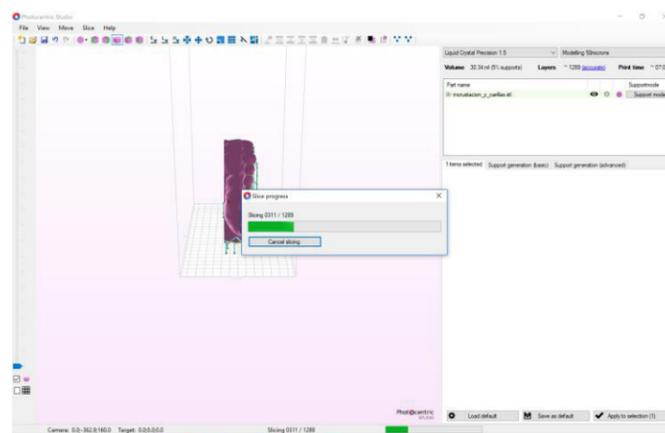

8. Now, start slicing.

9. Save the sliced *.cws file on your USB drive.

10. Please refer to the Photocentric Studio Manual for more detailed software instructions

2. PRINT

Note
We have stored a test file (LC Precision 1.5 test file.cws) on your printer. Please use this for your first print.

1. Insert your USB, and select the Print icon on the touchscreen

2. Your file will appear in the print job queue after a few seconds.

Note
For new users we recommend trying a dry print first (ie no resin in the vat), to make sure you have sliced your file correctly. Take the platform off, and press print; when you see your first slice/ layer on printer screen, press cancel. Put the platform back on and you are ready to print!
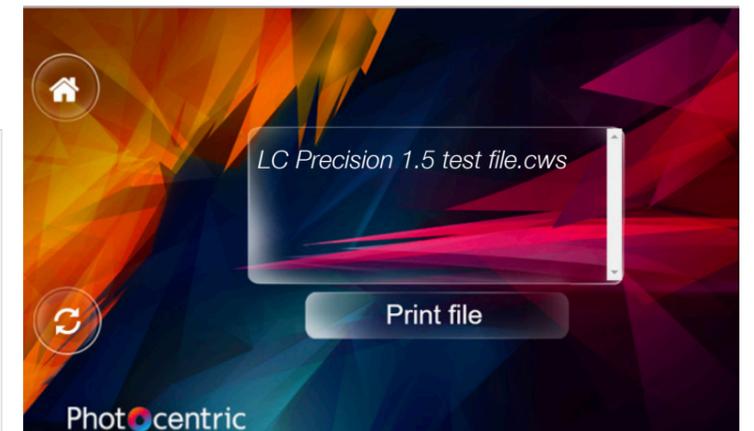
3. Take your 250g sample resin bottle, shake it and pour the resin into the vat.
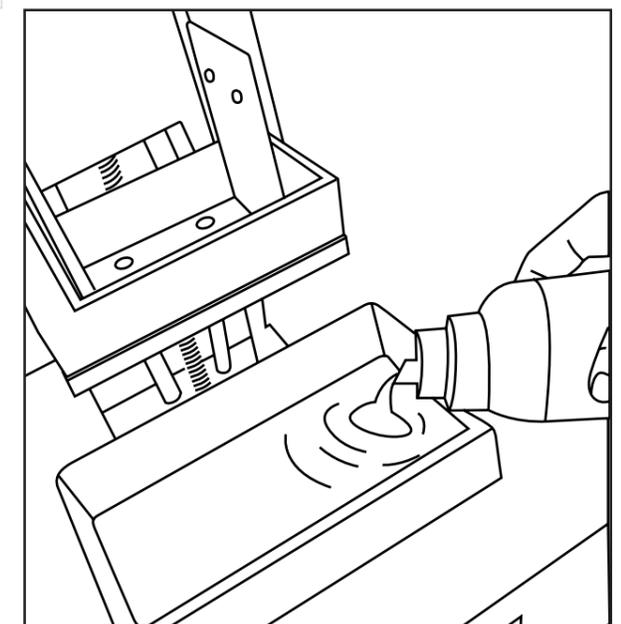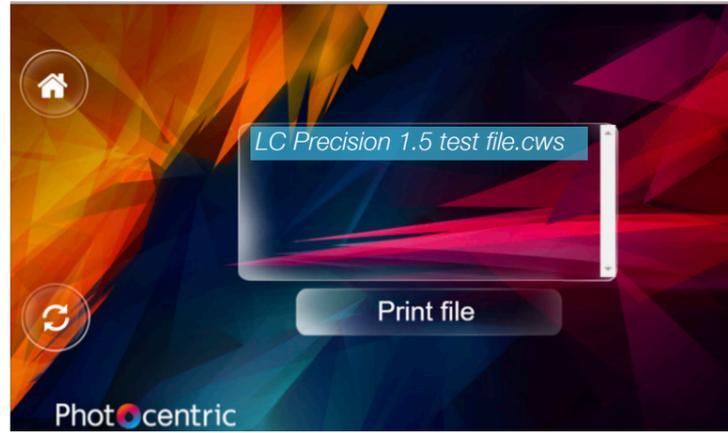
4. Put the hood back on.

5. Select the file, and press print. Be careful, the platform will start moving down.
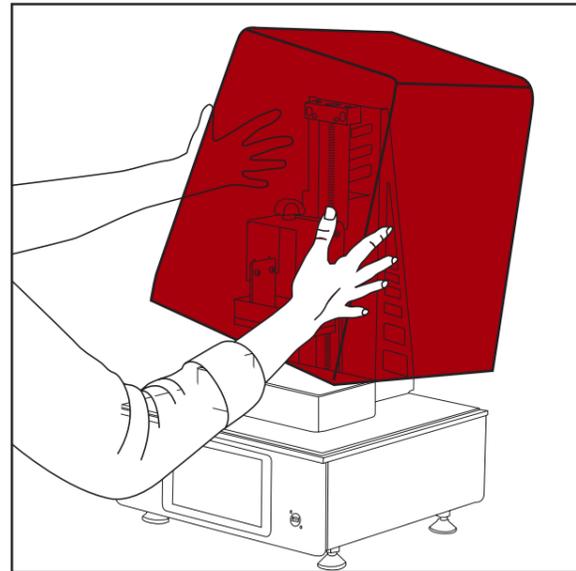
Note

The software may take a few seconds to calculate the print duration. The correct print time will be calculated after the completion of the bottom layer.
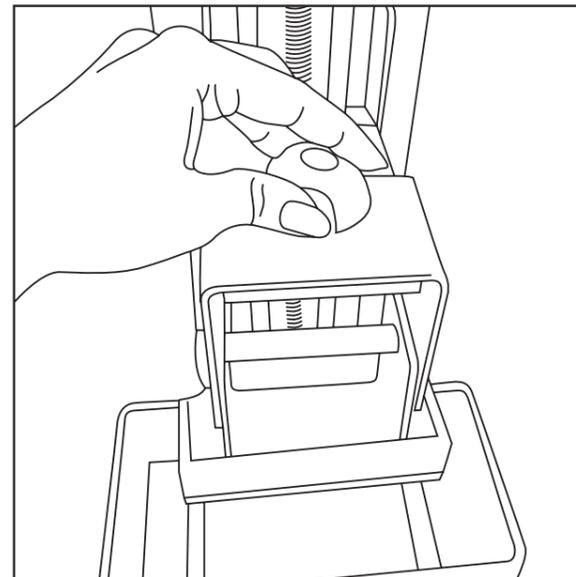
6. Once print job is completed, the platform will move back up to the home position and you can start the cleaning process.
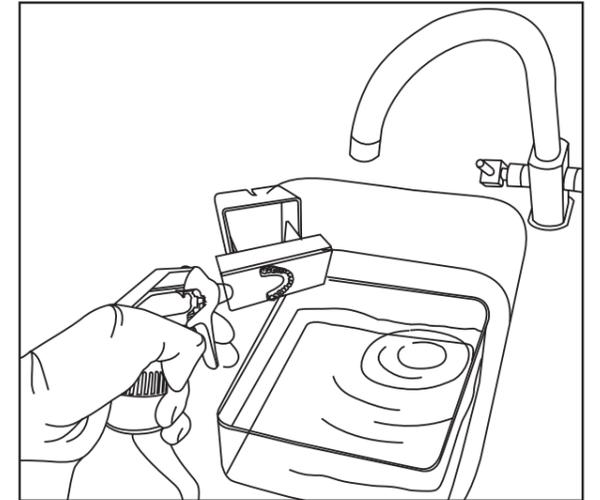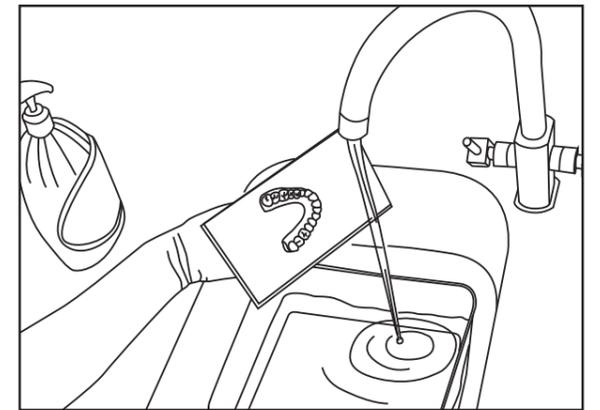
3. CLEAN

1. Take off the hood.

LC Precision 1.5 test file.cws

Print file

Phot**o**centric

2. Take off the platform. Place the hood back onto the printer to protect the resin in the vat from light.

---

3. Wipe excess resin from the platform off with absorbent paper. Hold the platform over a sink, spray warm soapy water or IPA over parts to clean off excess of resin.

4. You can rinse off the rest of resin with hot water. Be gentle with delicate parts. Water pressure may damage them.

5. Once cleaned, you shouldn't be able to see any trace of uncured resin.

6. If you have access to an air compressor with an air gun, you can dry your parts after cleaning. We recommend this for delicate and accurate parts to ensure all holes and pores are free of any traces of uncured resin.
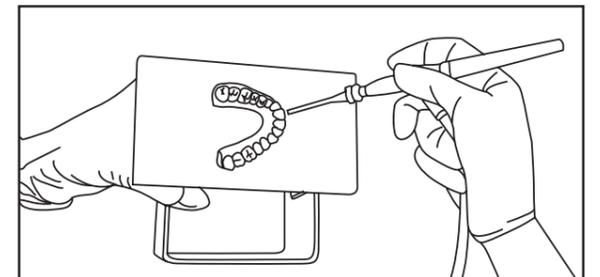
4. FINISH

1. Gently remove the parts from platform by sliding the scraper (provided) underneath parts.

> **Note**
> *Depending on your application, you can remove supports at this stage or leave them on during the post exposure process. For jewellery applications, we recommend removing the supports when parts are soft (before post exposure) to avoid leaving support marks on parts.*
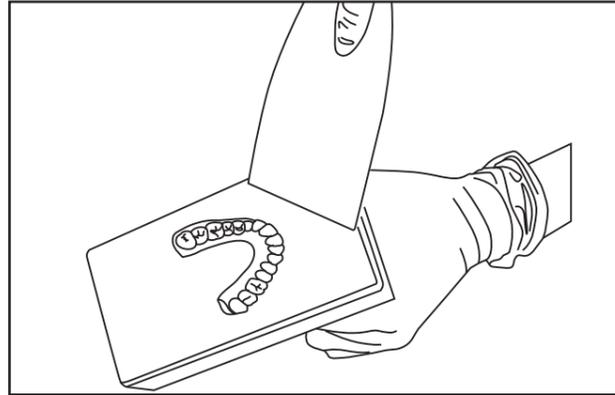
2. Place parts underwater in light (UV, sunlight or a table light) for a least 30 minutes to remove the surface tack. Parts get fully hardened by being under UV light for 2 hours and in hot water (60°C).

> **Note**
> *For any applications where accuracy of parts is critical (like dental use), we recommend post exposing in water and under light while parts are still attached to the platform.*

3. Once post exposure is complete, dry parts and your print is complete.

4. To prepare for the next print job, scrape off any cured resin and clean the build platform with hot water and liquid soap. Dry the platform.

5. Now, your build platform is ready for your next print, with no extra adjustment.

30 mins post exposure

2 hours post exposure

2 hours post exposure

60w

6. Pour the remaining resin in the vat back into the bottle through the funnel using the filter paper provided.

7. Use the vat cleaning tool (white card) to direct any excess of resin from vat down to the funnel.

8. Place the vat on paper towels and mop up resin residue with absorbent paper. After you can clean with damp soapy paper.

9. Ensure you clean the vat thoroughly. Cured resin can easily pierce the vat film and adversely affect the homing of your next print. Ultimately you could damage the screen film and even your screen.

10. If you have a leak on the screen, mop up the liquid resin immediately using absorbent paper or a damp tissue with soapy water or IPA. Hardened resin can be removed by chipping off with provided white card or plastic scraper. Metal scrapers should only be used with extreme care to avoid scratching the screen film.
It is extremely important to keep your screen plate surface clean from any resin. If not, you risk print failures.
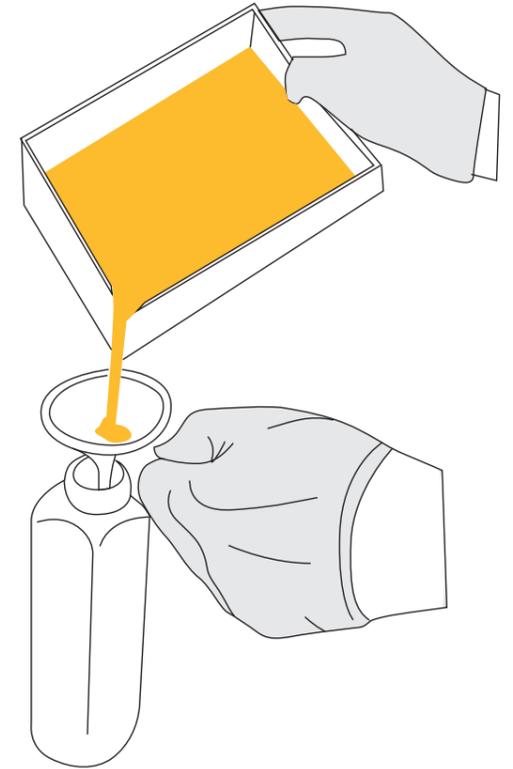
5. MAINTAIN

5.1 RE-SKINNING THE VAT (OPTIONAL)

Please read carefully.
A loose vat can have creases which create ridges in the base of the object.

TOOLS REQUIRED
*Scissors*
Craft knife
Pallet knife

MATERIALS REQUIRED
Photocentric vat film replacement pack, single sided sticky tape, double sided tape and paper towel.

We recommend you purchase a new set of disposbale Precision vats, however you can reskin the vat by following these steps. Re-skinning the vat is a simple process but care and attention must be paid to cleanliness and removing cured bits of resin. Make sure at each stage of the process that the work surface, vat, and your hands are very clean and free from debris that may cause holes in the film.

1. Remove the film currently taped to the vat and dispose of it. It may be possible to use the double-sided tape again if it has no resin on it. If the tape cannot be reused, remove it completely and replace on the lower edge of the vat.

2. Wipe the vat clean with tissue and warm soapy water. Pay attention to the underside of the vat, resin may have cured here. Remove any hard bits of resin as they may make a hole when tightening the new film over it.

3. Check the new vat film isn't pierced or dented and place it over the protective brown paper, on a flat work surface. Place one edge of the vat along the edge of vat film.
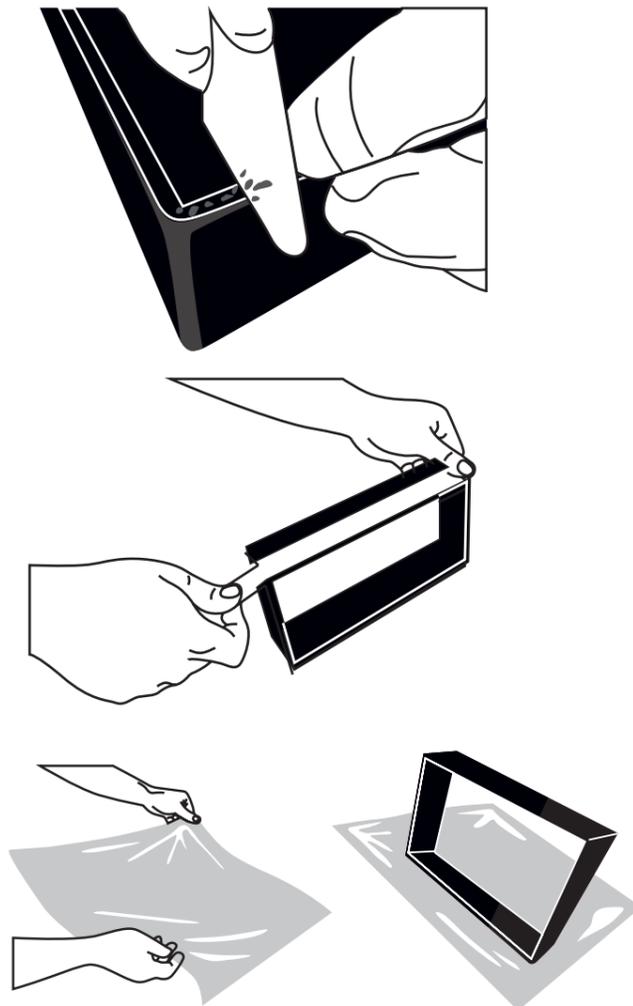
4. Fold over the other side of the film and pulling it firmly tight in the middle stretch the edges out so there are no creases.
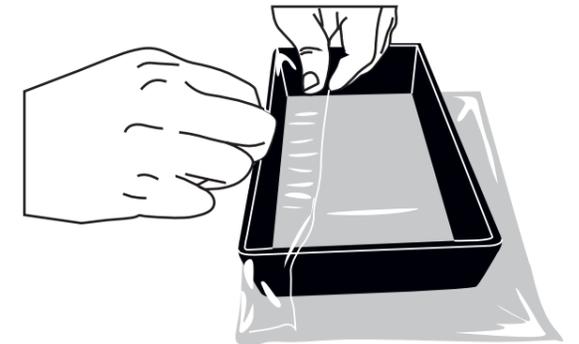
5. Pull each side of the film up and onto the sides of the vat.
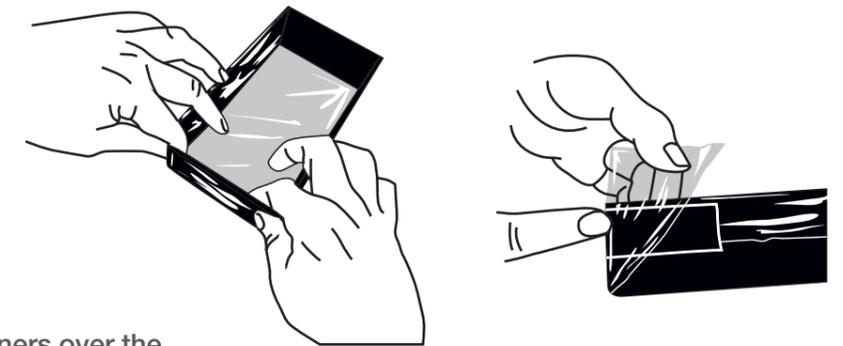
6. Apply single sided tape at the corners over the folds to keep the film tight. The vat should now be tensioned. Trim excess edges off. On the short sides of the vat place a piece of single sided tape.
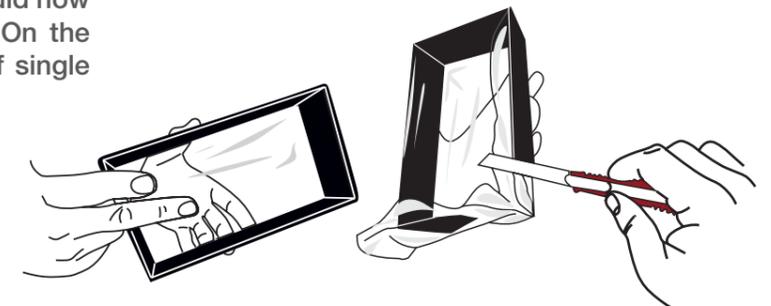
7. Finally, fill with water and leave on absorbent paper to check for leaks. Drain and dry with paper towel before use.

If you are unsure of the process and want a video guide, then please visit the Support section of our website.

5.2 PRINT PLATFORM CALIBRATION

We recommend you calibrate your platform every 100 prints. An uncalibrated platform may lead to failures due to first layers not attaching to the build plate or shifting layers during print.
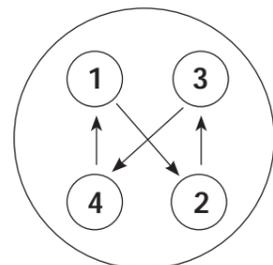
1. Select Maintain on the screen menu.

2. Press Calibrate Platform and follow screen instructions carefully.

3. Loosely lock the bolts in the orientation as shown in the picture and then tighten them all fully.

Four bolts

4. When you press Finish your calibration will be complete and your LC Precision is once more ready for use.

5.3 GENERAL MAINTENANCE

1. It is extremely important to keep the top surface of your printer clean. If the screen film gets damaged please replace it.

2. Please vacuum the two chassis fans (rear panel and bottom fans) every two months. It is important to keep fans dust free and avoid overheating the electronic parts.