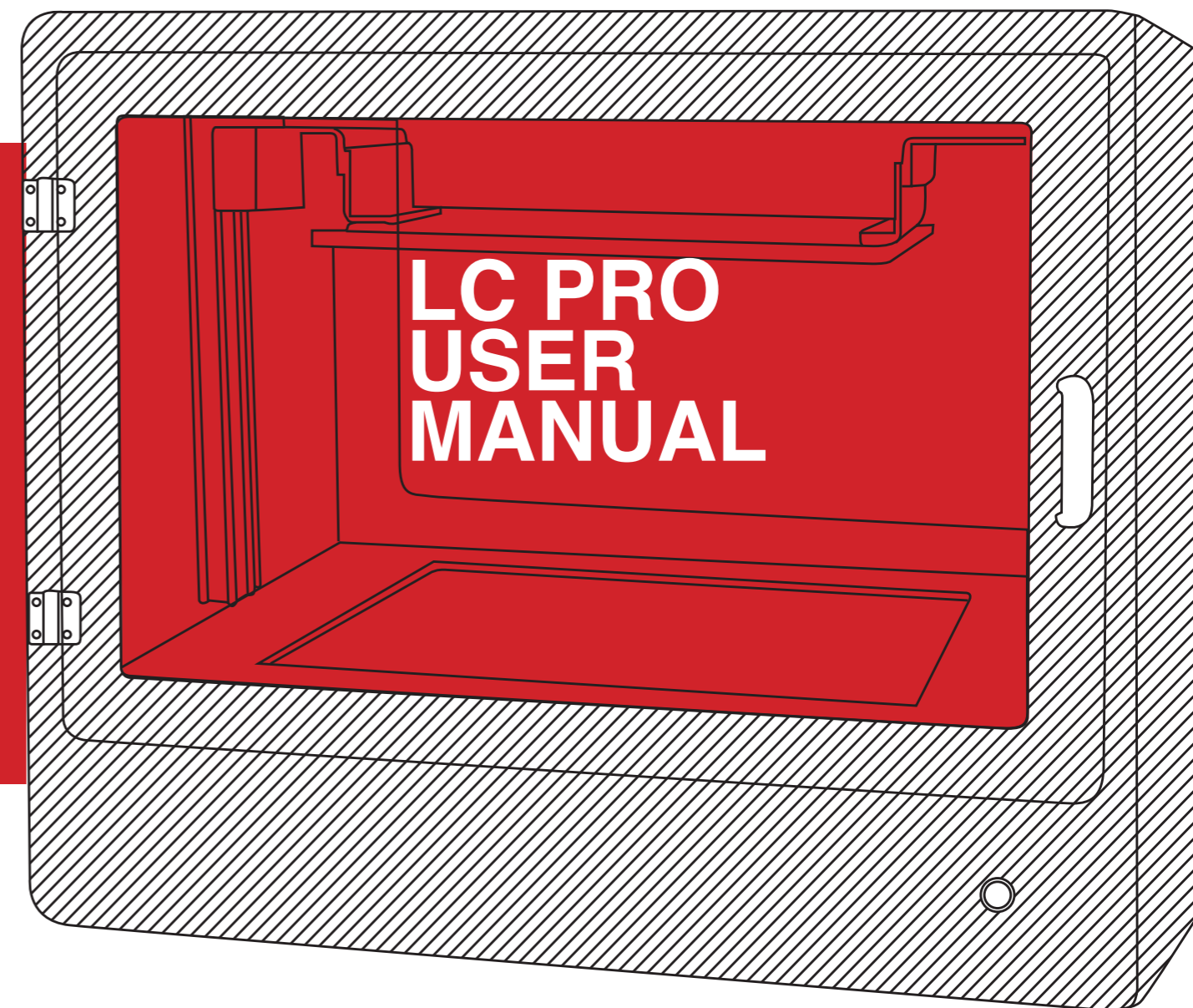# THE NEXT GENERATION OF 3D PRINTING IS HERE

LC PRO 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.

Liquid Crystal
PRO

LC PRO
USER
MANUAL

Liquid Crystal
PRO

Contents

Liquid Crystal PRO

EU DECLARATION OF CONFORMITY

LIQUID CRYSTAL 3D-PRINTER
Model: LC Pro

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 below.

Date of Issue: 08 June 2017
Place of Issue: Peterborough

Amanda Keating
Director

Manufacturer
Photocentric Ltd
Cambridge House, Oxney Road
Peterborough, PE1 5YW, UK
Year of CE Marking: 2017

$C\!E$

Liquid Crystal PRO

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. The light emitted from the screen is not modified and the images are safe for viewing.
These are some of the advantages of DPP technology:

i) *Low cost- We use high resolution low cost LCD screens that are widely available in monitors, tablets, mobile phones and televisions. These provide phenomenal value for money, which we pass onto you.*

ii) *Reliable- Because we don't modify the back light the screens are used normally and have a long life expectancy.*

iii) *Very large scale- The screen lights every pixel,* which in turn exposes every voxel, so you can create large areas of custom product simultaneously. As the format grows this makes it much more efficient than all alternative means.

iv) *Very low energy usage- It uses the amount of electricity to run a monitor, this is an order of magnitude lower than that required to operate a laser or a digital light projector.*

v) *Low adhesion at the build interface- the heat created by the screen is very low and the small amount of initiation energy in the polymerisation creates very little attraction to the vat film.*

vi) *Limited over-exposure- Using this low intensity visible light, the energy is dissipated very quickly, it either strikes a photoinitiator and creates a free radical or it loses all the energy hitting solid material, so there is very limited ability to over-expose and create solid parts where you don't want them.*

SAFETY INFORMATION

Read the instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product.

- 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.
- Do not use solvents to clean the printer as they may damage the screen. Use a little detergent and warm water to clean any resin spills.
- Disconnect the printer from the power 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.
- 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 cable. If you need to replace the power cable, make sure that the new power cable 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 the power.
- 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@photocentric3d.com.

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.
- Printer requires two people to lift it from the packaging.

- 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.photocentric3d.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.
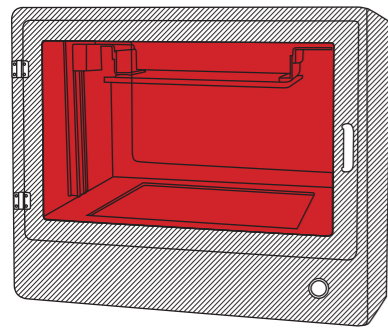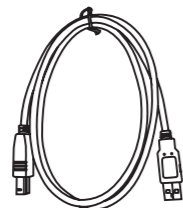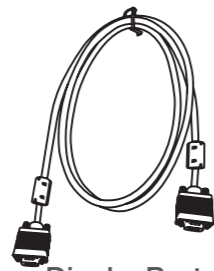
CON TENTS

The crate contains

Please keep all original packaging. In case of servicing or repairs needed, printers must be returned fully protected.
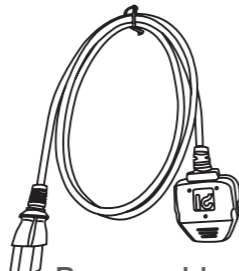
Liquid Crystal Pro Printer

USB Cable

DisplayPort Cable

Power cable

Print Plate
Vat
Scraper
Ratchet Socket Wrench
Vat Nut Socket
Allen Key
Funnel
Paper Strainer x 10
Spray Bottle
Nitrile Gloves x 4
Print Sample
Vat Film
Vat gasket

MINIMUM COMPUTER REQUIREMENTS

- 1.2 GHz processor or above
- Windows
- 2 GB RAM or above
- Computer must support a UHD monitor and have a spare display port

A one year Creation Workshop License is included with this printer. Please activate your license number on initial printer set up. The license number can be found on the back of the printer.

RECOMMENDED ITEMS

- Extra gloves.
- Paper towels.
- Access to a sink with hot water to clean the object.
- Liquid soap (detergent) to clean the object.
- Soft brush or sponge to clean the object.
- Glass or clear plastic container to post-expose the object in.
- Ultrasonic cleaner (optional)

1. INSTALLATION & ASSEMBLY INSTRUCTIONS

ASSEMBLY INSTRUCTIONS

1. Unscrew the top and front panels of the crate and remove them. The printer is heavy (approx. 65kg) so two people are needed to lift it from the pallet and into position.

2. Open the door and filly loosen the two star-knob bolts that secure the print plate assembly to the drive carriages.

3. Remove the whole print plate by sliding it out towards you and set it to one side. Remove the accessory box from inside the printer.

4. Remove the four vat bolts and carefully remove the vat. It is quite heavy.

5. Inspect the vat for damage caused during transit and if the film is in good condition, return it to the printer. If any damage to the vat film is detected, check for leaks by filling with water and standing on absorbent paper for 5 minutes, then dry before use. If there is a leak the vat will need to be re-skinned.
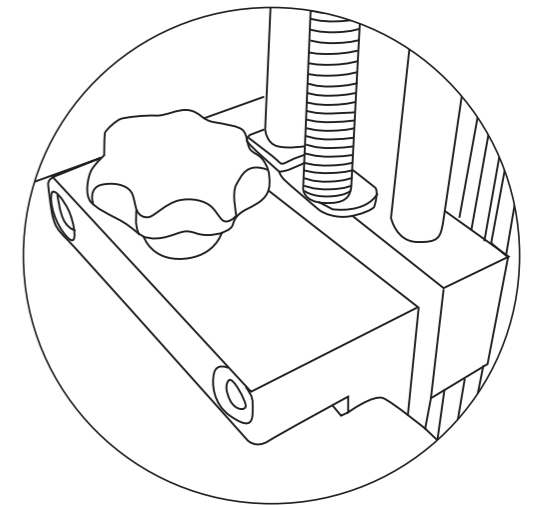
1.1. SOFTWARE INSTALLATION

1. Go to www.photocentric3d.com and download 'Liquid Crystal Pro Profiles' which can be found on the "Support" pages. The latest version is always online.

2. Make sure the DisplayPort, USB and power cables are plugged into the printer and then turn on the power using the rocker switch at the back. Turn on the screen using the switch at the front of the printer.

3. Go to your computer desktop, right click and open "Display Settings". Set your screens to "Multiple Displays" and "Extend this display mode", keeping your computer monitor as the main screen. Make sure that the printer's screen is set to a resolution of 3840 x 2160. There are videos online if you need further help.

4. Configure your computer so that the screen-saver does not come on and ensure that it does not have the power-saving mode enabled. If you forget to do this your computer may shut down mid process and the printer will switch off.

Note: **You will need to connect to the internet within 30 days of using your Creation Workshop license otherwise the license will deactivate. The license number can be found on the back of the printer. Then going forward the codes will need to be recognized online every 30 days after the first activation to validate and update the software.**

MINIMUM COMPUTER REQUIREMENTS

- Dual Core processor or above
- Windows
- Software NOT compatible with MAC and Linux
- 2 GB RAM memory or above
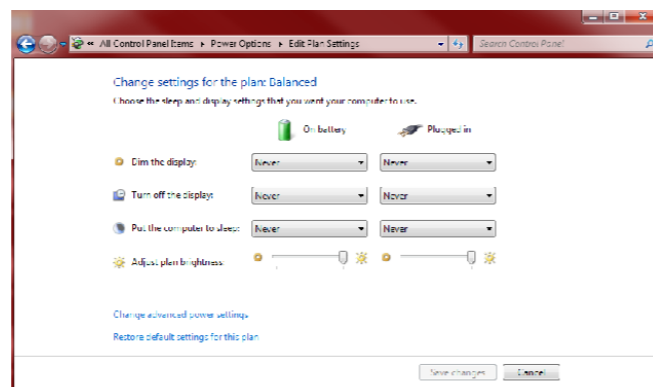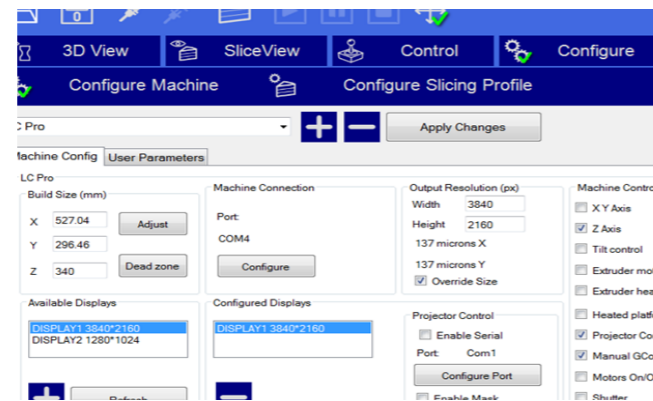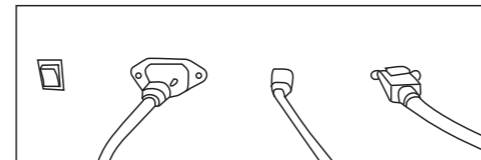
5. Execute the Creation Workshop software by double clicking on "CreationWorkshop.exe". If the software requires a license number insert the license number supplied on the back of the printer.

6. In Creation Workshop, click on "Configure", and then open the subfolder "Configure Machine". In the configuration folder connect the printer to the computer by clicking on the button "Configure" in the Machine Connection section. Select the port you have connected the USB to and set the speed to 115200 and data bits to 8. Press "OK" and finally press "Apply Changes". Now click [CONNECT ICON] to connect your computer and the Liquid Crystal.

7. If you are experiencing difficulties to start or connect your printer, go to our website www.photocentric3d.com, and visit "Support". You will find videos that will run you through the issues you may find due to specific computer settings. Should you still find difficulties, please contact your national supplier or contact us at info@photocentric.co.uk.
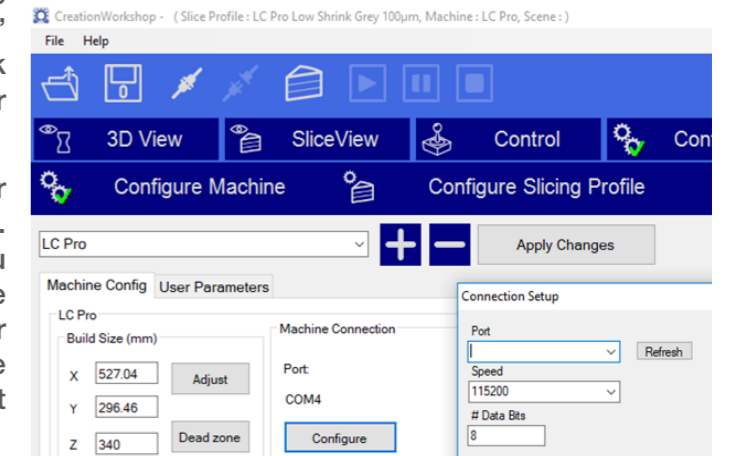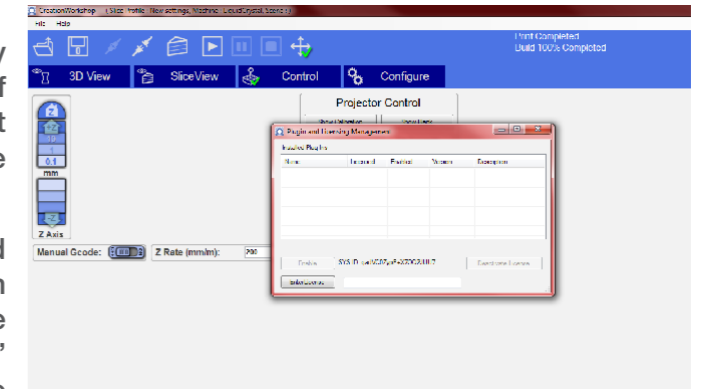
1.2 CONNECTING THE PRINTER

1. Connect the printer to the PC using the connect button.

2. Check that the printer has successfully connected by moving the drive up a small distance. Remember that the printer will not move unless the door is closed

3. If the printer doesn't connect successfully, go to the 'Configure' tab and press the 'Configure' button in the 'Machine Connection' frame. Choose a different COM port from the drop-down menu (if available). Press 'OK' then press 'Apply Changes'. Connect the machine again and try moving the drive (remember the door must be closed). If all COM Port options have been tried unsuccessfully, contact Photocentric for further support.
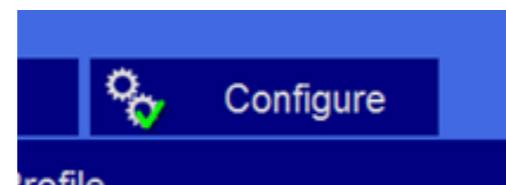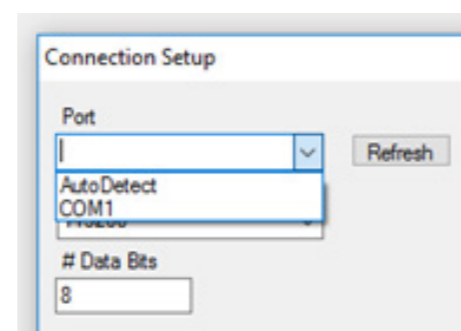
2. SLICING YOUR PRINT

1. Set up the machine profile in Creation Workshop as shown below. Remember to press 'Apply Changes'.

2. Set up the slicing profile in Creation Workshop as shown below. Remember to press 'Apply Changes'.

3. If you have a powerful computer, for highest quality prints, set anti-aliasing to 10. This will take more processing power and not all computers can process slicing when anti-aliasing is 4 or above. If yours will not slice, keep anti-aliasing at 3.

4. Open the STL file that you wish to print. Adjust scale, position, rotation etc using the controls provided on the right hand tool bar in Creation Workshop. Your printed item(s) should be positioned centrally within the build area. Add supports if required using the left hand tool bar in Creation Workshop. You may need to expand this tool bar by pressing the '+' button.

5. Slice the STL file using the button. Use the 'Slice View' tab to review the slice images. If you have difficulty generating the slices correctly, contact Photocentric for further support
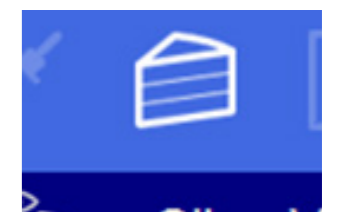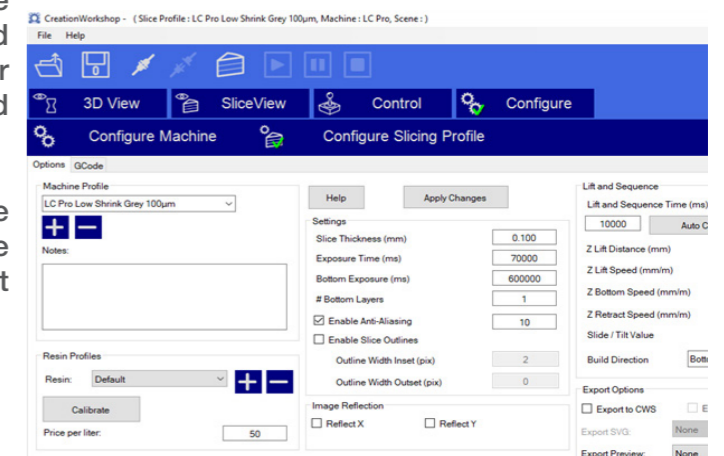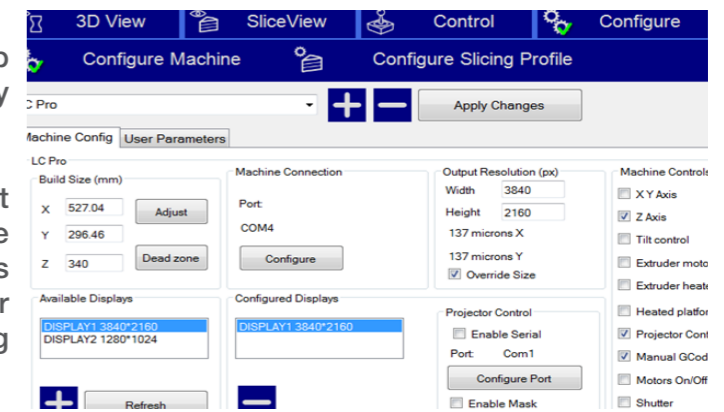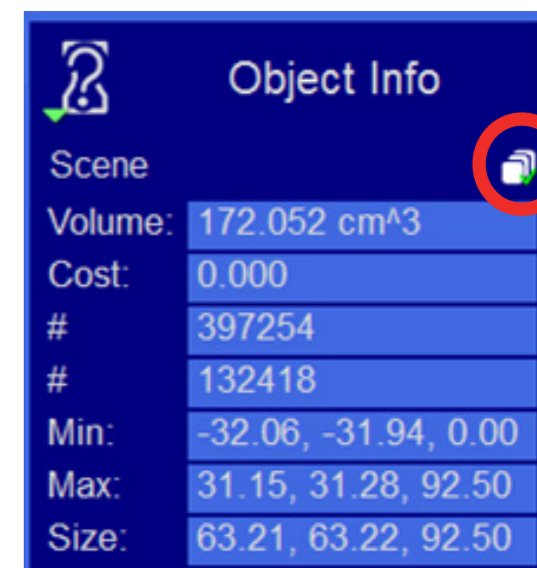
3. SETTING UP
A PRINT

1. Check the first slice of your print on the printer's screen using the button below, in the 'Slice View' tab. (Use the push button on the front of the printer to turn the screen on and off.)

2. Return the screen to black by pressing the 'Show Blank' button in the 'Control' tab.

3. The vat should be inside the printer, empty and clean. Tighten the vat bolts firmly. They should not apply downward pressure to the vat. They are only there to prevent the vat moving horizontally or tipping.

4. On the print plate assembly, loosen the hex-head bolts that secure the L brackets. They should be loose enough to slide easily in the slots but not more. A hex key is provided in the accessory box.

5. Check that the drive carriages are at least 100mm above the bottom of the rails. Slide the print plate assembly into place in the printer. Push it back against the stops. Tighten the two star knobs that secure the print plate to the drive carriages.

6. Make sure that the print plate can still slide in the slots. Press the 'Home' button on creation workshop (the door must be closed).

7. Wait for the printer to reach the home position. If the print plate started in a very high position, it may stop before reaching home. If so, press the 'Home' button again. Press down evenly on the print plate with one hand and tighten the hex-head bolts that secure the L brackets. These bolts should be tightened firmly.

8. Close the door and move the print platform up 10mm.

Projector Control

| Show Calibration | Show Blank |
| Hide | Edit Commands |

Ref
Section 5.
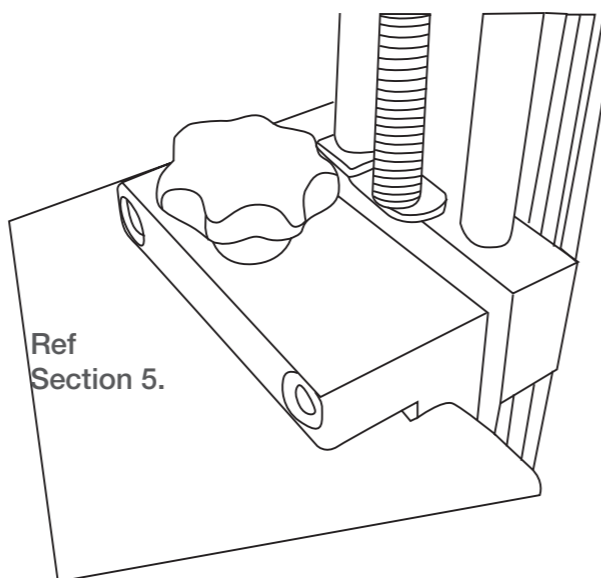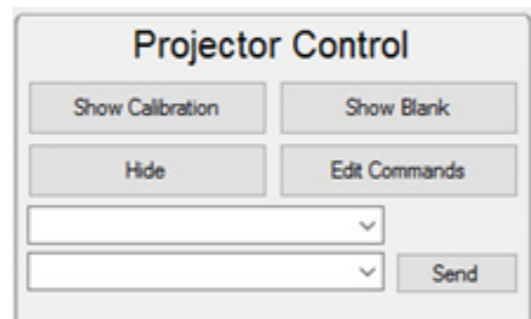
9. Check the volume of resin required in Creation Workshop. Make sure the circled icon has the green check mark to give the total volume. This will include all items and any supports. Add 700 cm3 to this figure to allow for a full covering of resin in the bottom of the vat during the final layers of the print.

10. Wear protective gloves and measure out the resin. Be careful not to expose it to bright light for more than a few seconds. Excessive resin will make emptying the vat more difficult, insufficient resin will prevent the print from completing successfully. The maximum recommended volume of resin in the standard LC Pro vat is 4000 cm3 (4 litres).

11. Carefully add the resin to the vat. Pour in the centre of the print plate and it will drain through the holes. Close the door and drive the print plate down 10mm. Wait a few seconds for the resin to settle. Press the 'Print' button in Creation Workshop to begin printing.

Object Info

Scene

Volume:	172.052 cm^3
Cost:	0.000
#	397254
#	132418
Min:	-32.06, -31.94, 0.00
Max:	31.15, 31.28, 92.50
Size:	63.21, 63.22, 92.50

4. REMOVING THE FINISHED PART, CLEANING AND POST-EXPOSING

1. When the print is complete, turn off the screen using the push-button on the front of the printer. Use Creation Workshop to drive the print plate up until the print is clear of the vat. Allow the print to drain for a few minutes to reduce the chance of drips.

2. Make preparations for cleaning the print. You will ideally need a large sink with a good supply of hot water. The ambient light level should be low. Have a spray bottle with a hot, very dilute solution of washing up liquid is also useful. Wear protective gloves at all times you come into contact with liquids.

3. Loosen the bolts that secure the print plate to the drive carriages. Grip the print plate L brackets firmly and take the weight of the print. Carefully slide the print plate towards you and out of the machine. Close the printer door take care not to drip resin.

4. When your print is finished remove the platform from the printer and lay it with the object facing upwards in a large plastic tray. Spay the part throughouly to remove all the unreacted surface polymer. When you have covered the entire surface, finish by spraying with warm water. You can use a sponge or soft brush to clean detailed parts. Alternatively use a large utrasonic cleaner.
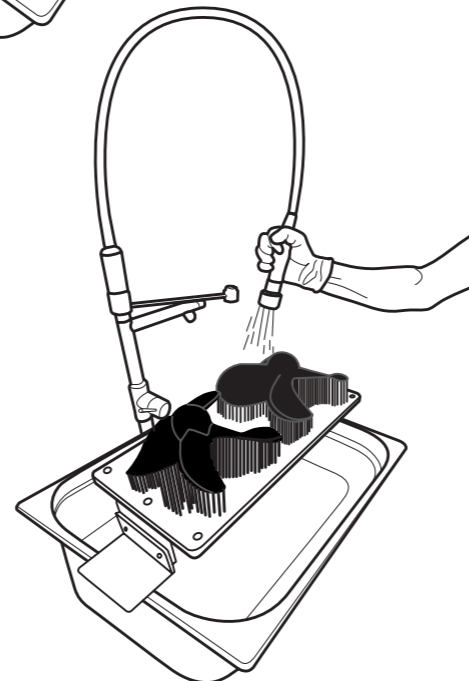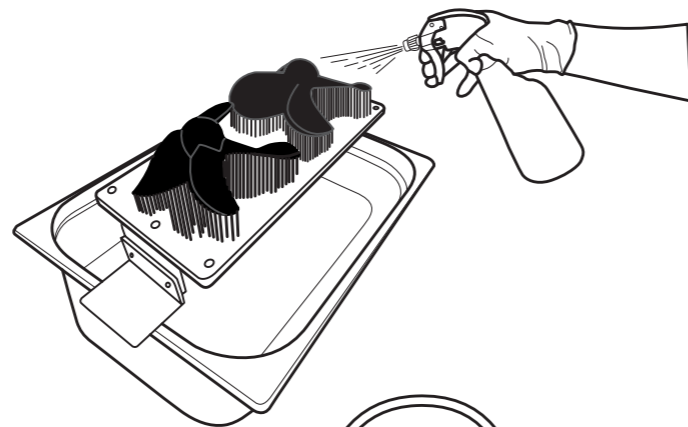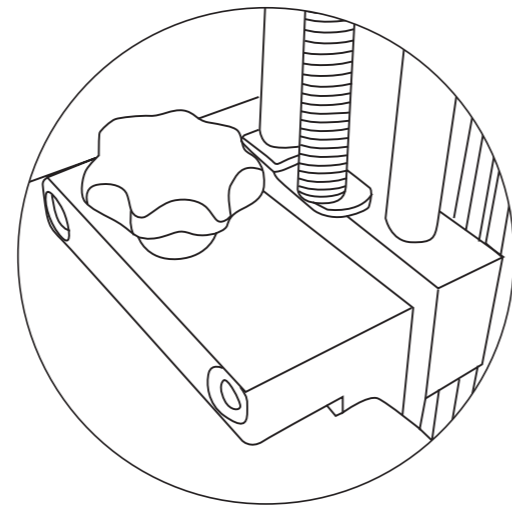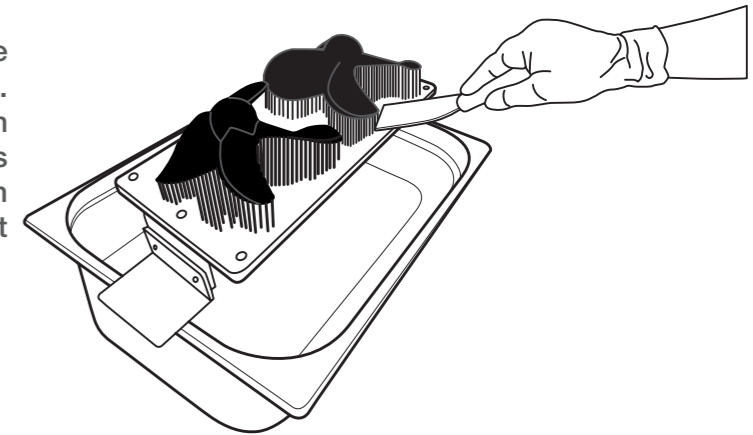
5. Using a scraper detach the supports at the base to remove the part from the platform. Handle it gently as it won't achieve full strength until after full post exposure. If your part is strongly adhered to the build platform you can aide removal by heating the metal to expand it by applying hot water or a hot air gun to it.

6. Fill the tray with clean water and place the part in it so that it is fully covered. Expose to strong visible or UV light for 30 mins to dry the surface and achieve full hardness. In the case of larger prints you will have to turn it over so the underside receives light as well.

7. Clean the print plate thoroughly. Make sure all cured resin is removed from the underside of the plate as this may cause damage to the vat or screen. Hot soapy water and/or methylated spirits can be used to clean off uncured resin. Make sure the print plate is completely dry before returning it to the printer.

8. Once the printed part(s) have been fully post-exposed they should be removed from the water and dried thoroughly. Any support material can be removed using clippers.The part can be sanded if neccessary.
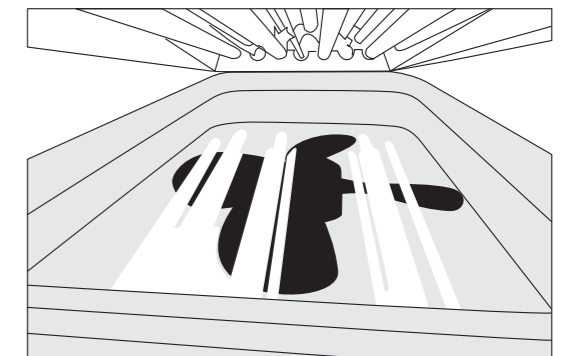
NOTE
If you're printing something delicate or you wish for your print to stay in its constructed shape, you will need to complete the post exposure in water whilst the print is still attached to the platform.

5 EMPTYING AND CLEANING THE VAT

1. Before starting a print on the Liquid Crystal Pro, the vat should be emptied and cleaned. Wear protective gloves. Ensure that the ambient light level is not too high, don't work in direct sunlight and use low lighting where practical.

2. Prepare an area for cleaning the vat. You should have a smooth, flat, clean surface with plenty of space. Lay down two layers of paper towel to protect the vat film from scratches and soak up any spilled resin. Have a supply of paper towels, a bottle of methylated spirits, and a bin nearby. Do not work on a surface that could be stained or damaged by contact with resin.

3. Position a 5 litre resin bottle near the printer on a flat, stable surface and at a convenient height. Be sure that there is enough space in the bottle for all of the resin from the vat. Remove the lid of the bottle and insert the funnel (supplied in the accessory box) into the top. Place a clean filter (supplied in the accessory box) inside the funnel.

4. Remove the four vat bolts and set them aside. Grip the vat firmly by the handles and lift it carefully out of the printer. The vat will be heavy, especially if there is a large volume of resin remaining. Pour the resin gently into the funnel from one corner of the vat. Pour at a steady rate and be careful not to over-fill the funnel. Resin will flow over the flange of the vat; this is not a problem.

5. When most of the resin has drained from the vat, place it on the paper towels ready for cleaning.When the funnel has drained, remove it from the resin bottle and replace the lid.
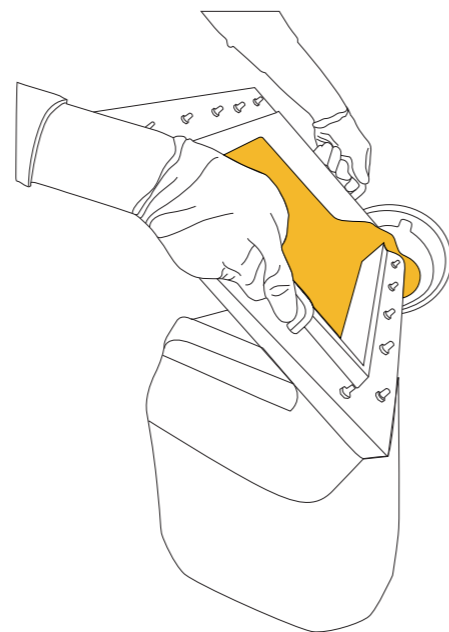
6. Use paper towels to clean up the resin on the flange of the vat. Be particularly careful to clean the resin out of the holes. If resin is allowed to cure in the holes it can obstruct the nuts and make it difficult to re-skin the vat. Methylated spirits can be used to help clean the vat body.

7. Use paper towels to clean up any further resin inside the vat. At this point it is important to remove any pieces of cured resin that remain in the vat. Anything left inside the vat could cause damage to the vat or screen when the printer is homed. It could also could prevent successful printing. It is best not to apply methylated spirits directly to the vat film.

8. Once the vat is clean, inspect the film for any signs of damage or excessive wear. If there is a puncture, or obvious damage, replace the vat film. If the vat is in good condition, return it to the printer. Replace and tighten the vat bolts.
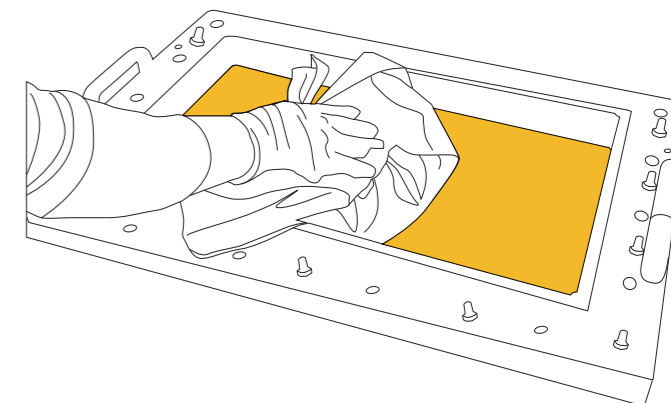
6. REPLACING THE VAT FILM

You Will need:

Complete vat
New piece of vat film
New vat bottom gasket
New vat top gasket
Ratchet socket wrench (or socket driver)
Paper towels
Methylated spirits, IPA or Acetone
Scraper or palette knife

Note:

Work on a clean flat surface with plenty of space

1. Disassemble the vat, dispose of the film and gaskets, and clean all other parts thoroughly. Check that any cured resin is removed. The vat parts will not be damaged by cleaning solvents.

2. Place the vat bottom film frame.

3. Lay the new piece of film over the vat bottom film frame. Position it centrally. Grip the film tightly on either side of one of the long bolts. Press the film down firmly to puncture it.

4. Move to an adjacent long bolt and press the film down to puncture it again. Make sure that the film is under tension as you create the new hole so that there are no creases.

5. You can use the socket supplied in the accessory box as a tool for puncturing the film. The square hole in the top of the socket works best as it is a close fit over the bolts.

6. The backing paper supplied with the replacement film can be placed under the vat bottom film frame. This will help protect the film from damage during the rest of the assembly procedure.

7. Carry out the same procedure for the short bolts, using the socket to puncture the film.
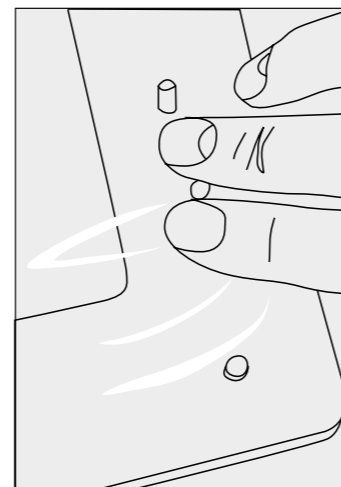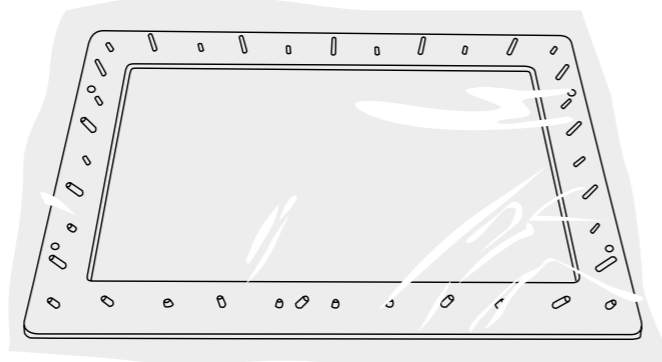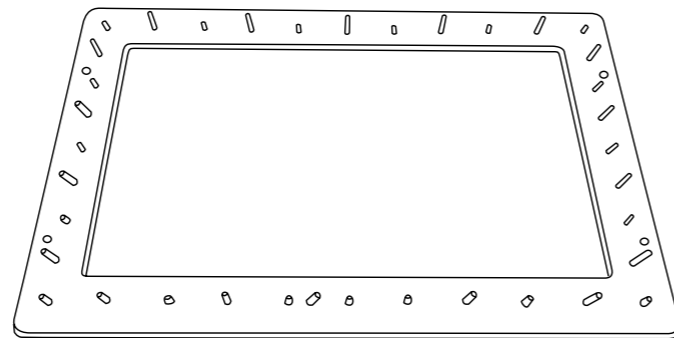
7. Carry out the same procedure for the short bolts, using the socket to puncture the film.

8. Use scissors to cut away a triangular piece of film outside each of the short bolts. Carefully make two cuts from the edge of the film to the punched hole.
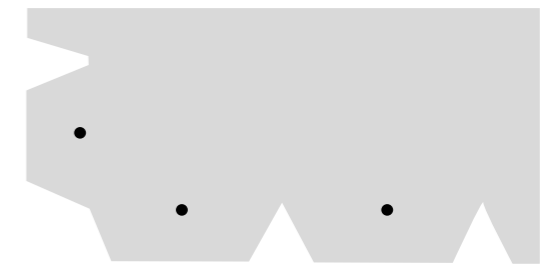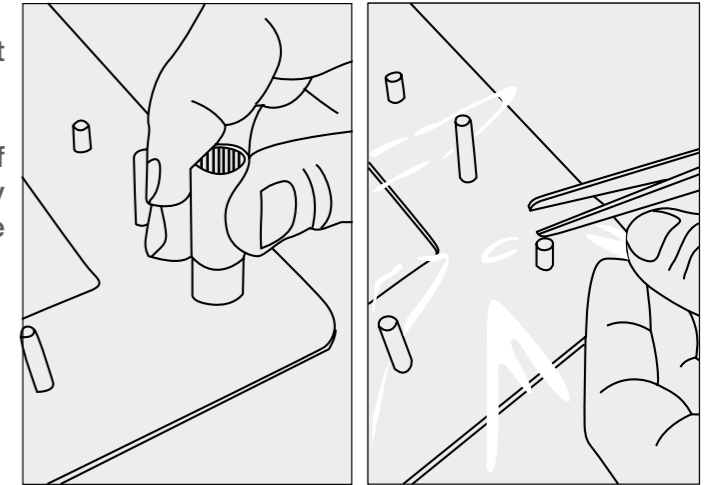
9. Widen each of the remaining holes by gripping the edge of the film near each long bolt and stretching outwards slightly.

10. Lay the vat bottom gasket (with small holes) down over all the bolts.

11. Lay the vat top gasket (with small and large holes) down over all the bolts.
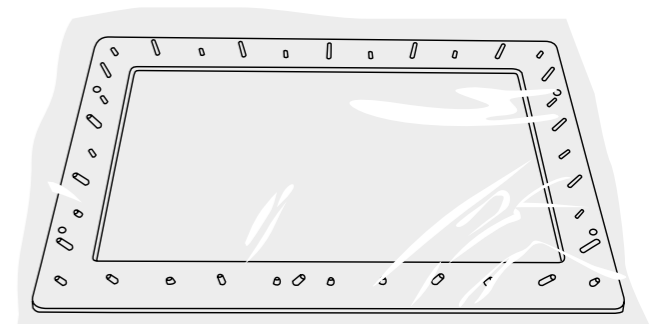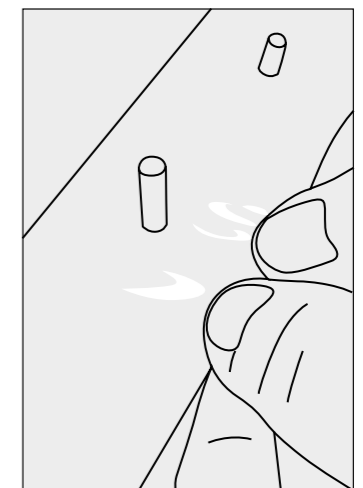
12. Place the vat body onto the bolts. The handles should be on the top.

13. Take 18 vat nuts and thread them about one turn onto the long bolts. You may find that you need to lift the vat bottom film frame slightly to allow the thread to engage.

14. Once all 18 vat nuts are in place, you can start to tighten them using a ratchet socket wrench or a socket driver. Work around the vat giving each nut two or three turns. It should take three or four passes to fully tighten all the nuts.

15. The film should be pulled taught as the nuts are tightened. If any creases remain once the film is taught, the vat body will have to be removed and the holes in the film stretched to correct the creases.

16. Lift the completed vat and carefully turn it on to one edge. Rest it on the table and check that the vat body and the vat bottom film frame are parallel. The gaskets should be under uniform compression. If there are any gaps, the nuts have not been fully tightened evenly or something is obstructing the thread. If the vat body has been significantly distorted by the compression around each nut, they are too tight.

17. Also inspect the vat film where it is stretched over the wall of the vat. There should be no holes, creases or other visible damage. If any pieces of cured resin or other contamination is trapped between the vat wall and the film, this could cause a leak during use. In the corners, there may be some creasing in the film. This is acceptable as long as the creases do not extend onto the base of the vat.

18. Turn the vat around and inspect each side as described above.

19. The vat is complete and ready to use in your Liquid Crystal Pro. Following this procedure applies less tension to the vat film than in the standard configuration. This can assist with release of the print from the vat and improve
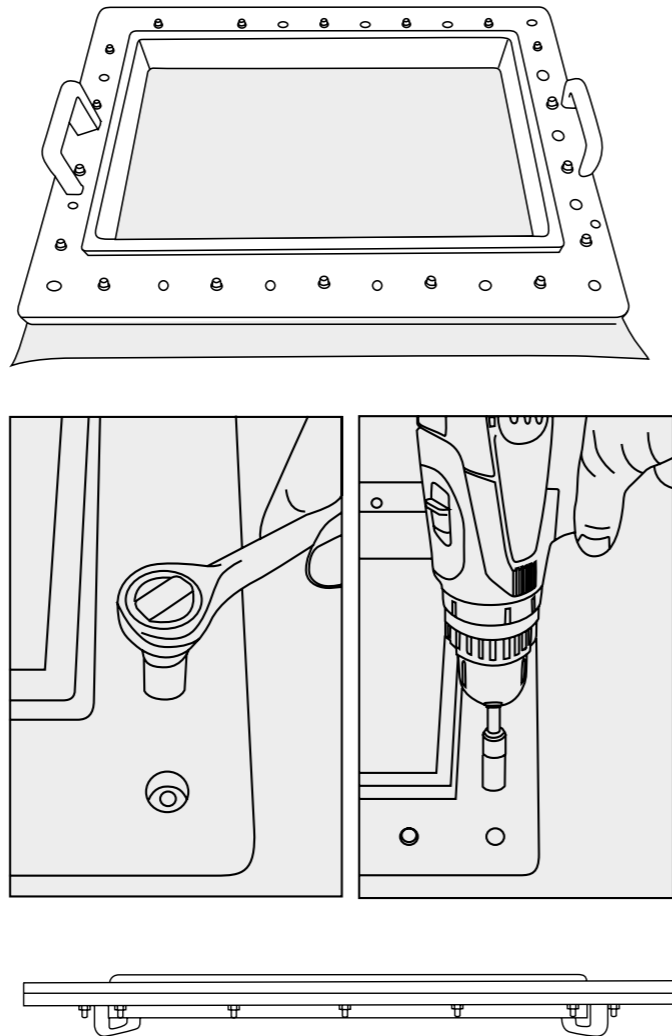
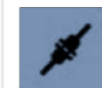## 7. DETAILED CREATION WORKSHOP SOFTWARE INSTRUCTIONS

Main screen
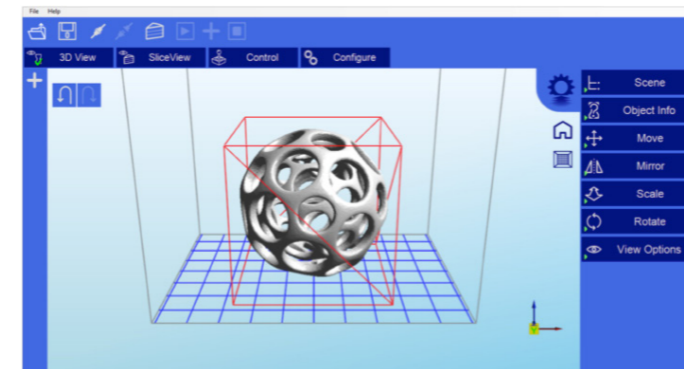
Click to open files in one of the following formats: .STL, .OBJ, .3DS or .AMF. You can also open scene files with the .CWS extension.

Click to save the current object as a .STL or .CWS file. The .CWS format allows you to prepare a scene to be printed repeatedly in the future, together with supports and positioning.

Click to start the connection between your computer and your Liquid Crystal 3d printer. Once the button is greyed out, this means that the printer is connected.

Click this button to disconnect your printer from the computer. If the button is greyed out, it means that the machine is currently disconnected.

These three buttons start, pause and stop a print. These buttons only become active once you have sliced your object.
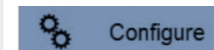
3D View
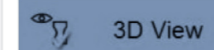
Clicking this button allows you to view the 3D objects within their boundary box. You can add supports in this function.

Slice View

Clicking this button accesses the "Slicing" screen. You can see the individual slices that have been generated as well as the G-code.

Control

This allows you to control the z axis motor, home it and lift it after a print has finished.

Configure

This is the setup screen that allows you to configure the slicing and printing profiles.

1. Loading a Model

Click here to 'Load' your file. Multiple objects can be loaded and manipulated independently. You can also open scene files with the .CWS extension.

2. Scene View

The Scene View allows you to manipulate various aspects of the scene.

Selecting

You can select a model by double clicking on the model, or selecting it with the scene view

Removing a Model

You can remove a model by right-clicking on the name in the scene graph and selecting "Remove". The Minus sign "-" will also remove the current model. You can also delete a model by selecting it and then pressing the "delete" key on your keyboard.

Cloning a model

You can select a model in the scene and click the "+" sign to clone it. The cloned object will appear

3. Object Info

This tabs provides you with information about your model

4. Move View

The Move function allows you to move objects on the build platform along the x:y:z axis by the distance entered.

From left to right, the other tools are:

The 'Place on Platform' button will position the bottom of the model to rest on the bottom of the build platform.
The 'Center' button will center the model at (0,0,0).

• Auto-Arrange will automatically lay out all models to fit on the build platform. Any model that does not fit within the build platform will be moved outside the build area.
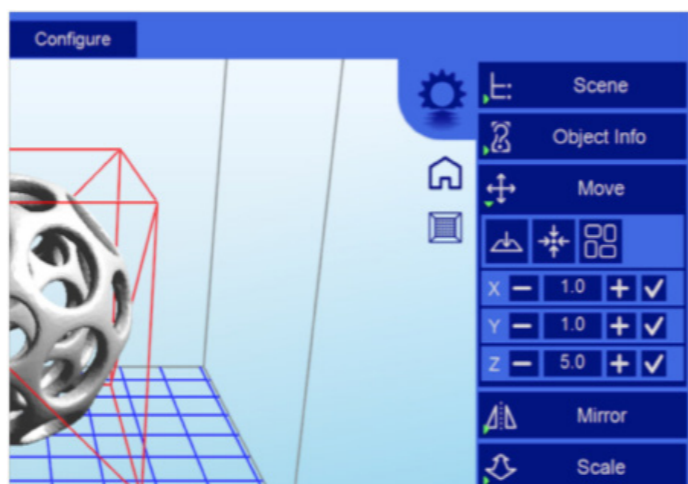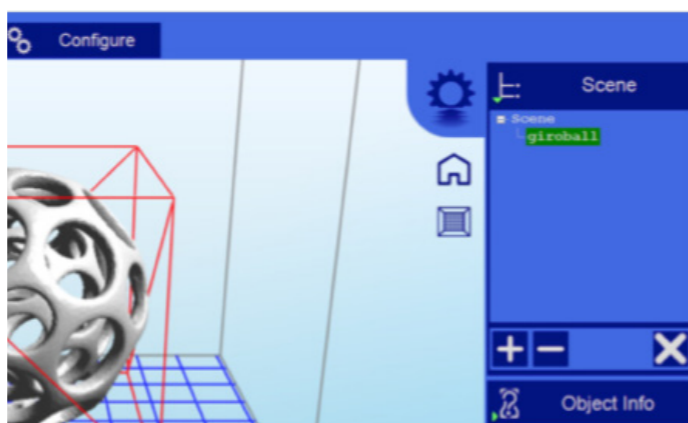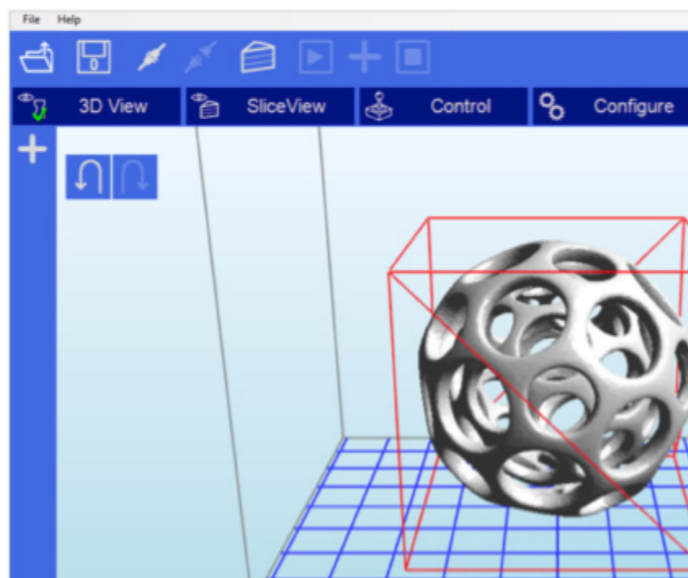
5. Mirroring Objects

The Mirror view allows you to mirror the selected object on the specified axis.

6. Scaling objects

A model can be scaled (reduced or increased) by selecting it, and using the 'Scale' view to enter in a new scaler value. Press the tick button to re-scale your object.

7. Rotating Objects

Rotating a model works in a similar way to moving a model. Simply select the model you want to work with, and use the X/Y/Z +/- buttons to rotate the model by your specified degrees.

8. View Options

The view option allows you to manipulate various views and models.

On the top row from left to right:

• 50% Alpha-Blending toggle. This will allow you to see through the objects in the scene to see the geometry

• Show Slice Preview on Scene. After slicing this toggles on/off the view of the 3D view of the current slice layer as selected by the horizontal scrollbar.

• Show Console. This toggle button shows or hides the debug window. This window is used for debugging purposes.

On the bottom row from left to right are tools

to change the way the objects appear on the screen:

• Show objects with a bounding box.
• Show objects with an outline
• Show selected objects in a different color
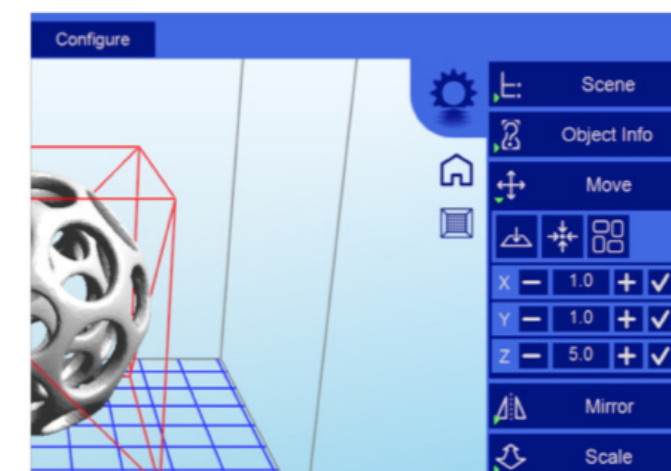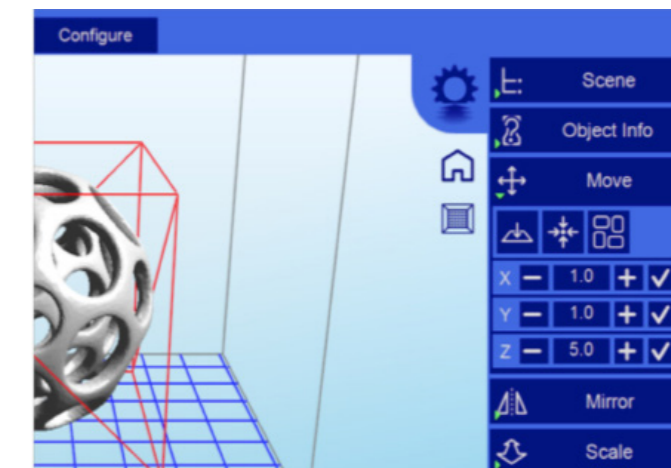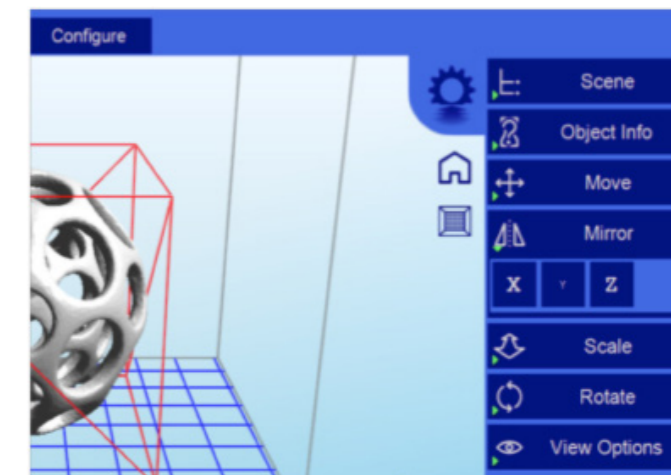
9. Working with Model Support tools

Using Supports

Supports are sometime required to properly attach a model to the build space. Because of the nature of DPP the lower layers must be supported by the supports unless it has a wide surface in the first layers. We recommend checking no supports pass through your object. If they do, you can delete them and manually add others if needed.

Adding a single Support

A single support can be generated by clicking the manual support button.

Moving Supports

After a manual or automatic support has been generated, individual supports can be moved around the x:y plane the same way models can be moved. Select the support by double clicking on it to select it, and hold down the 'Shift' key on your keyboard and move the mouse. Supports will automatically scale vertically under the model they support.

Angled Supports

Supports can be angled inwards towards the objects they support. This can often resolve clearance issues with vertical supports. You can turn a vertical support into an angled support by selecting it, and holding the 'Ctrl' key and clicking on the model you want to support.

Manual Configuration

Under the Support Generation view, you can click 'show downward facing polys'. This will highlight all polygons in the model that are pointed downward by the specified degree. This helps you manually place supports under un-supported downward facing areas of a model.

Auto Support on Grid

After a model is loaded into the scene and selected, you can automatically generate a 'bed of nails' support for the model by selecting 🗼 *.*

You can specify the grid spacing and the size of the generated supports. If you wish to only generate supports on downward facing polygons, check the boxes under 'support general' and 'generate only on downward'

Adaptive supports

You can add supports to areas in the model that are unsupported. There are 2 algorithms to help you accomplish this.
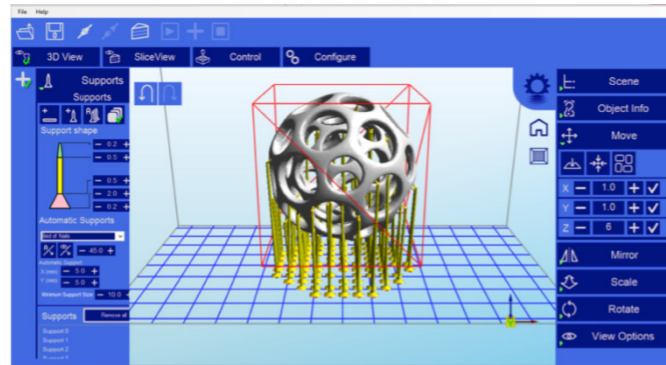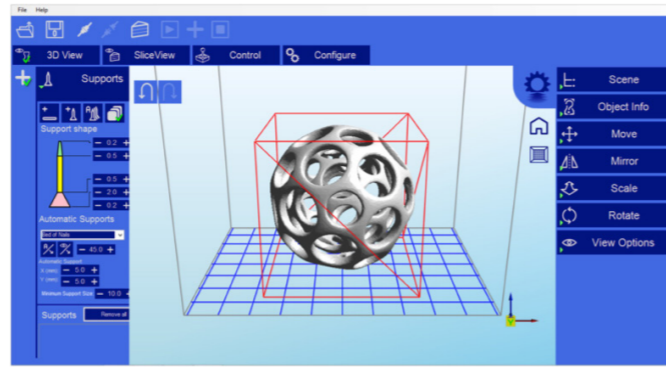
10. Saving a Scene

Click to save the current object as a .STL or .CWS file. The .CWS format allows you to prepare a scene to be printed repeatedly in the future, together with supports and positioning.

After one or more models have been loaded and manipulated on the build platform, the entire scene can be saved as an STL model for later use. Simply click on the 'File->Save Scene STL' menu item to save the scene model. This will flatten all models in a scene into a single STL file. Scenes can also be saved to CWS files. These scene files can be used to create a scene with supports, slice the scene, and later load to print your scene without the need for re-slicing.

11. Slice View

In the Slice View screen we get the following information:

There are two buttons for each of the available options.

- *The first option has the same name as the screen itself (Slice View). In this setting we can see (as shown in the image) each successive layer of the generated "Slicing". With the lower bar we can scroll through the entire slicing result to check each of the layers. In the upper left corner we can see the total number of layers that have been generated. In the lower left corner we have a (🖼) button to turn the screen on and expose the selected layer.*

- *G-Code View: On this screen you can see the G-code generated during the "Slicing" operation. This option is intended for advanced users. We recommend to leave this screen untouched.*
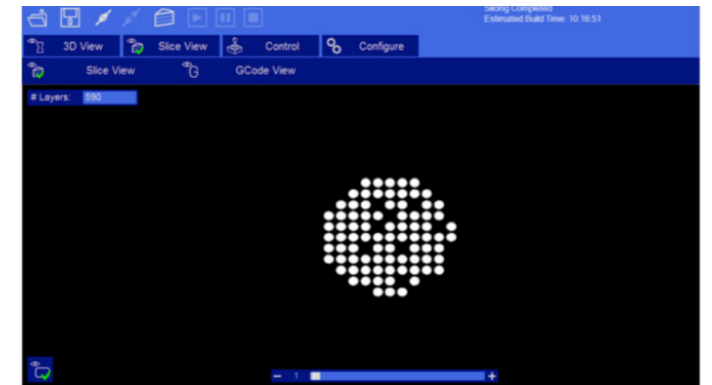
12. Slicing a Model
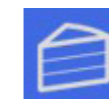
Once you have loaded one of the models, configured your machine profile, and configured your build & slicing profile, you can slice a model. Choose the slice icon from the toolbar ro bring up the slicing screen.

You can change the currently selected slicing profile to use. Click the 'Slice' button to begin slicing. You can stop slicing by pressing the 'Cancel' button. If your slicing profile is configured to export images, a progress bar will appear here. Otherwise, just the gcode for the scene will be generated and the images will be rendered during build-time.

## 7.1 PRINTING LARGE 'BLOCKED SHAPED' PARTS ON CREATION WORKSHOP

For best results with large 'block-shaped' parts with flat faces, lift them off the print plate slightly and use a 'bed of nails' support structure. Also rotate the part by 45 degrees in the X axis, then 45 degrees in the Y axis so that no face or edge is parallel with the print plate.

If the part is positioned flat and in direct contact with the print plate, it creates huge suction forces between the part and the base of the vat in the early stages of the print. You may see warping in the early layers of the print, or poor adhesion between layers, possibly resulting in print failure.
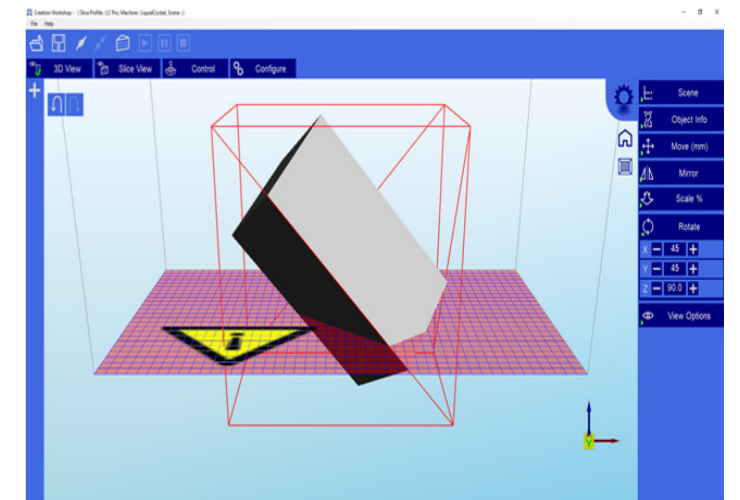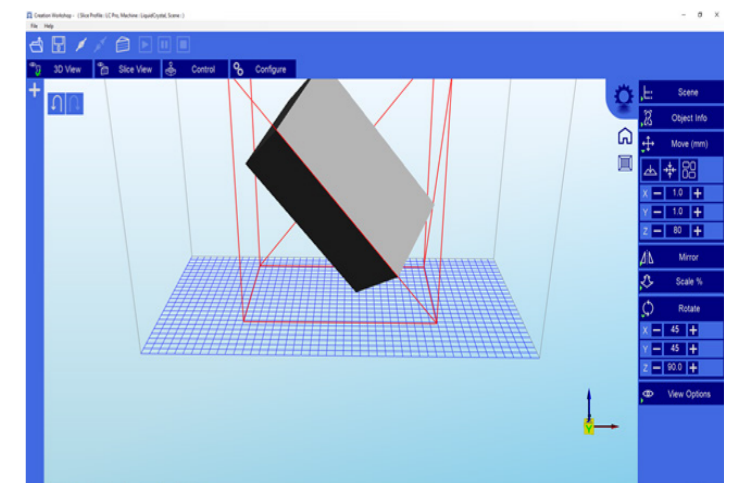
Below is an example with a simple block:
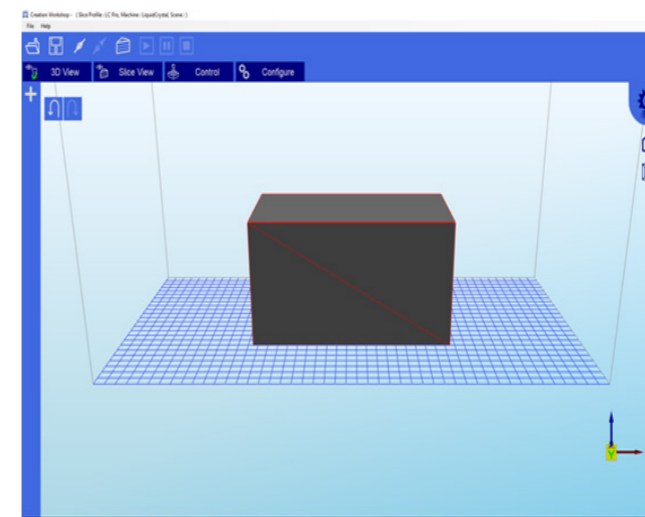
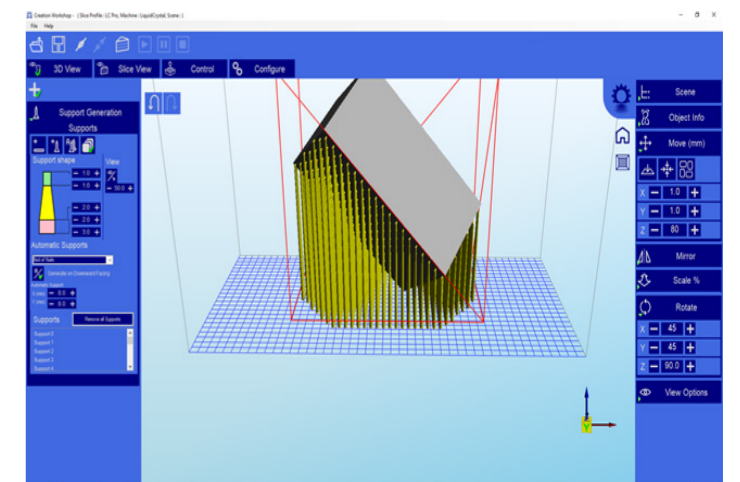*1.The part defaults to this position, flat on the print plate*
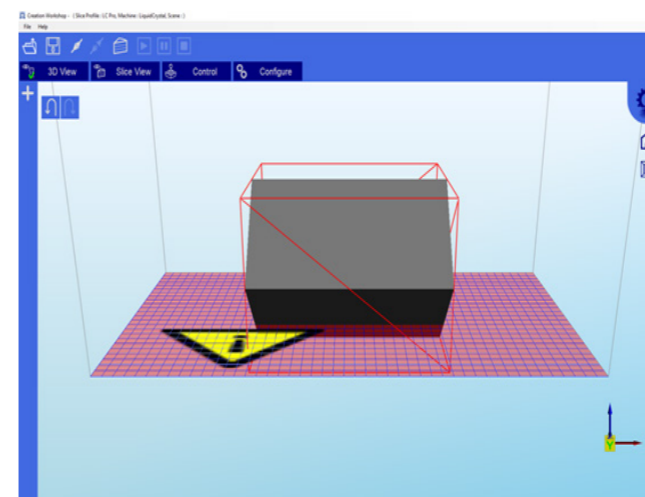
2. Rotate by 45 degrees about the X axis

3. Rotate by 45 degrees about the Y axis

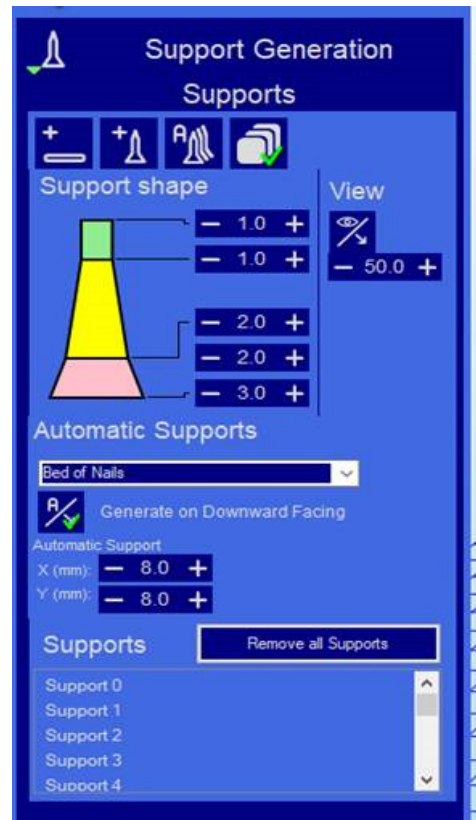*4. Move up (by 80mm in this case) to clear the print plate*

*5. Generate 'bed of nails' supports*

6. Note support dimension settings. We find these settings are a good starting point. If you want to achieve a good flat surface on the supported face, you may prefer to use a higher density of supports. For very heavy parts, you may need thicker supports.

7. Manually add additional supports if necessary. The most crucial part is the leading corner (ie the first section to print).
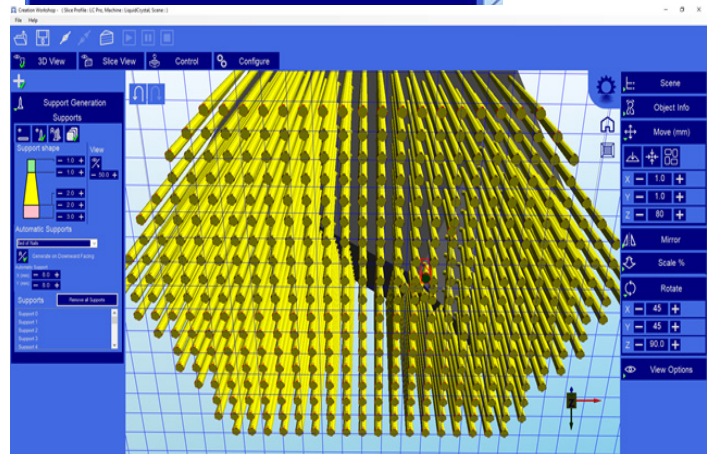
8. This is an example with angles of 20 degrees used instead of 45. Making the print quicker and using less resin in the supports. This will tend to result in a less smooth finish on the supported face. 45 degrees is always optimal for roughly block-shaped objects. Of course, to optimise the available print volume for very large objects, you may want to print in a more flat orientation. This is possible but you should always use a bed of nails (at least approx. 5mm long). The supported surface will never have a completely smooth finish if it is orientated horizontally but this can be rectified by sanding.