

# Lite3DP Gen 2

## *QUICK START GUIDE*



Lite3DP

*«Lite3DP Gen 2: Quick start guide»*

LITE<sub>3</sub>DP LLC

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For more information, please visit:

[www.lite3dp.com](http://www.lite3dp.com)

[www.github.com/Lite3DP](http://www.github.com/Lite3DP)

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## 1. SAFETY PRECAUTIONS

First of all, please read the safety information sheet included with the machine and keep it for future reference.

Follow the safety data sheets for 3D printing resins, isopropyl alcohol, and all chemicals you use with the Lite3DP. Nitrile gloves, eye protection and a well-ventilated environment are necessary. If the LCD printing display is exposed, do not look directly at the UV light.

The Lite3DP should not be exposed to direct sunlight or contacted by conductive elements such as metals. It should be used on a flat, non-conductive surface.

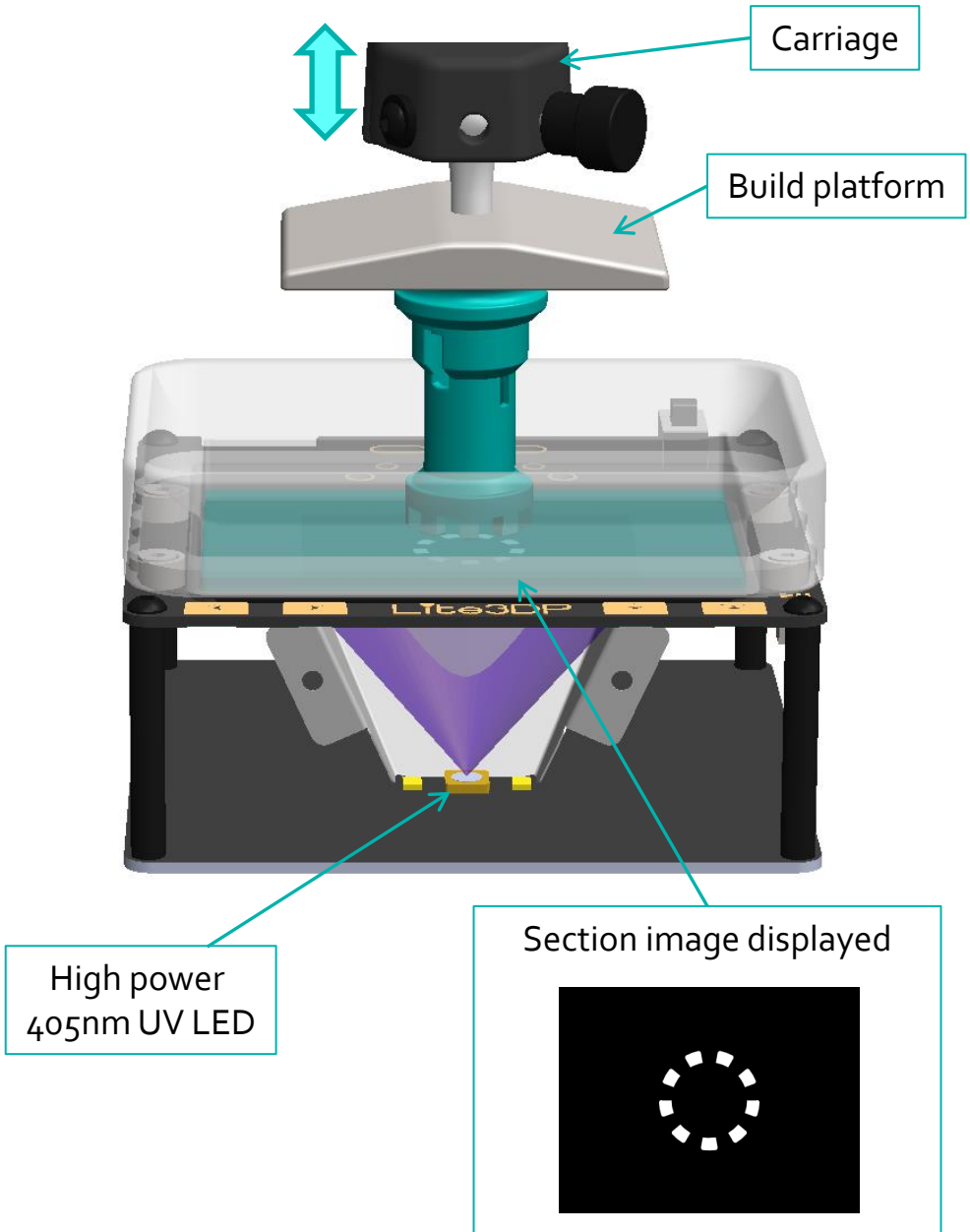
The Gen 2 features an auxiliary connector with voltage and communication pins with the microcontroller. Any incorrect connection may cause permanent damage to the main board. Please only manipulate the auxiliary connector pins if you have adequate knowledge and at your own risk. The same applies to connecting the CP2102 auxiliary board and uploading new firmware.

The machine is not designed to be powered by a USB port (it is only used to upload firmware), it must be connected to an external 12 V DC power supply and a minimum current of 1000 mA, with a 5.5\*2.1 mm diameter cylindrical connector. Any external power supply used with Lite3DP Gen 2 must comply with relevant regulations and standards applicable in the country of intended use.

Immediately replace the vat release film if there is any sign of breakage, wear or leaking. **CAUTION:** Leaking resin into the machine can cause permanent damage.



## 2. MSLA 3D PRINTING CONCEPTS





## 2. MSLA 3D PRINTING CONCEPTS

MSLA 3D printing is based on the principle of solidifying, layer by layer, a photosensitive resin using a UV light source. On each layer, an image corresponding to the section of the part to be printed is displayed. UV light passes only through the displayed section for a certain exposure time, solidifying the resin into its shape.



The first solidified section adheres to the build platform, and all the rest to their previous one. After the solidification of a layer is complete, the build platform rises to peel off the model from the release film (FEP/NFEP/ACF) and allow a new layer of liquid resin to form. When the platform descends, it is located at a distance from the release film equal to the layer thickness, to continue with the solidification of the next layer.

For each layer thickness and for each different resin, the appropriate values of printing parameters must be assigned: exposure times, build platform lift heights, speeds, among others (see section 5.2).



## 2. MSLA 3D PRINTING CONCEPTS

In order to get a successful MSLA 3D print you will need:

### 1. Preparation of the build platform and the resin vat

The preparation of the build platform consists of completing the leveling procedure (see section 4, build platform leveling).

The resin vat must contain resin, in a minimum quantity to form a continuous layer on the release film and in a maximum recommended quantity corresponding to the vat inner step ( $\sim 2\text{-}7\text{ cm}^3$  for mini vat,  $\sim 6\text{-}40\text{ cm}^3$  for standard vat):



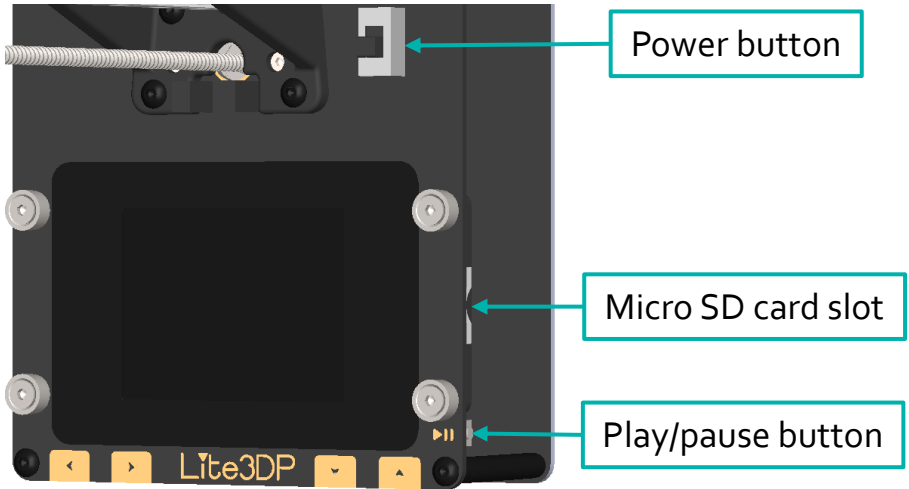
### 2. Generation of the print-job sections

The images of the sections are obtained from a slicer software. For each model to be printed, you must have a folder with numbered images in PNG format (320\*426 px) in the micro SD memory (see section 8, slicing).

### 3. Configuration of the printing parameters

Twelve parameters must be configured appropriately for each resin and layer thickness to be used. This can be done from the main "Parameters" section or just before finishing the "Print" section workflow. Six memories are included to store the set of parameters. (see section 5.2).

### 3. INTERFACE

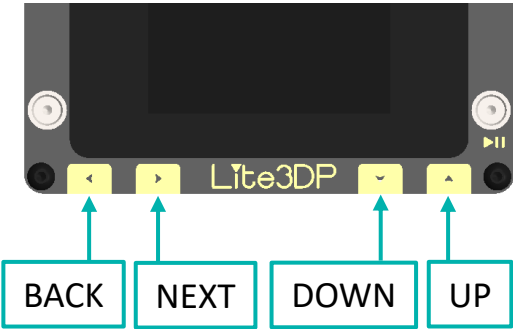





The Play/Pause button has the following functions:

1. By keeping it pressed on the initial "PRINT" screen, you can manually raise the platform in case of an unforeseen event.  
**CAUTION:** the machine does not have an upper endstop, be careful not to hit the bearing support.
2. Allows you to stop the preview of the sections, after choosing the file to print.
3. Allows you to pause the print job by holding it down until the current layer finishes. When you pause, the platform will rise, revealing the part being printed. Printing resumes when you press it again.
4. Starts the print job and the vat cleaning process.



3. INTERFACE

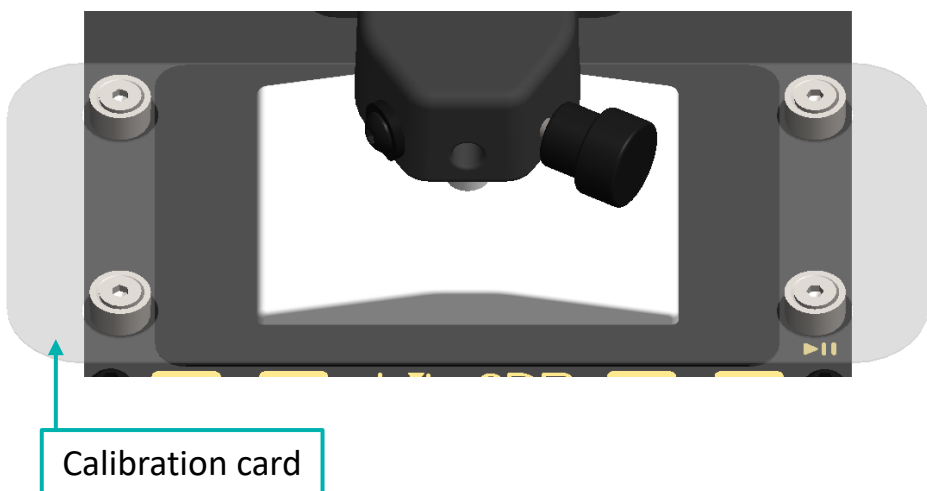
OLED	TOUCH
<div><p>Capacitive touch buttons for navigation of the menu displayed on the main screen.</p><p><b>OLED auxiliary display:</b> Shows the progress of the print job and additional information.</p></div>	<div><p><b>Touchscreen display:</b> Allows intuitive menu navigation using on-screen arrows, as well as available options.</p><p>On selection screens like the one shown above (and the confirmation screens), pressing the box/center of the screen is equivalent to the NEXT arrow.</p></div>



## 4. BUILD PLATFORM LEVELING

The platform must be level before starting a print job.

When leveling, it is ensured that the build platform has its flat surface parallel to the glass of the mask display, at a distance equal to the thickness of the release film and firmly secured by adjusting the hand knob tightening screw.



For leveling, release the hand knob screw, hold the build platform on the carriage magnet and place the leveling card on the display (two thicknesses are included, the thinner one for NFEP/FEP films and the thicker one for ACF films). Before starting, arrange the platform so that its flat side is as parallel as possible to the display. At the end of the descent, with the **UP** and **DOWN** arrows, you can fine-tune the distance of the platform, so that it is just above the calibration card. This value is stored in the permanent memory for subsequent leveling. If the platform is too tight, it will collide with the display. If it is too loose, the initial layer will not adhere to the platform.



## 5. MAIN MENU


Lite3DP



PRINT

Start printing workflow.

Lite3DP



PARAMETERS

Adjust printing parameters and optionally store them in memories (A-F).

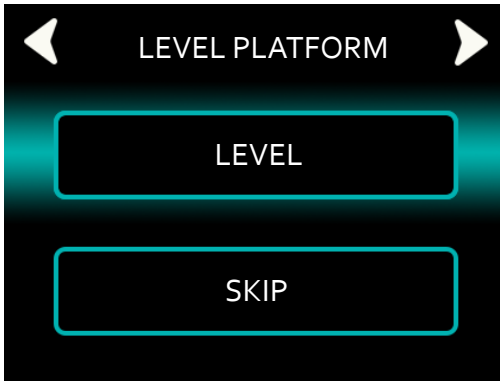
Lite3DP



TOOLS

Access the resin vat cleaning tool and factory test. The first allows a layer of resin to solidify on the release film to facilitate cleaning of adhered solid pieces.

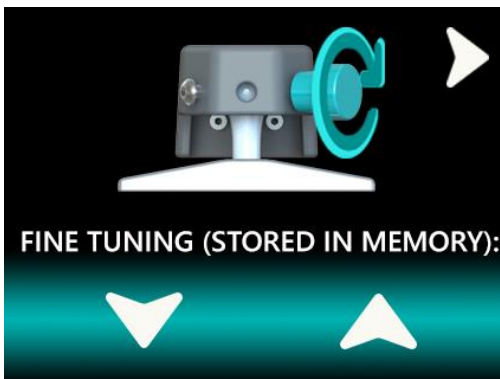
## 5.1. «PRINT» SECTION



The workflow begins with leveling the build platform. Only skip this step if leveling was previously completed and was not used for printing.



See section 4: build platform leveling.

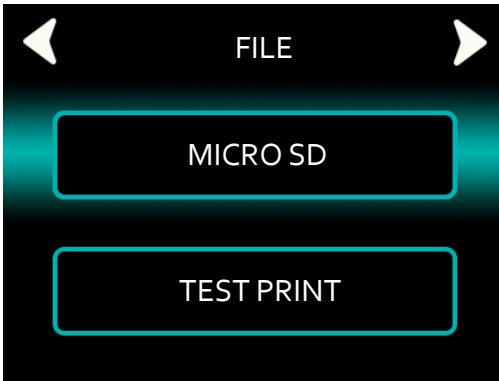


See section 4: build platform leveling.



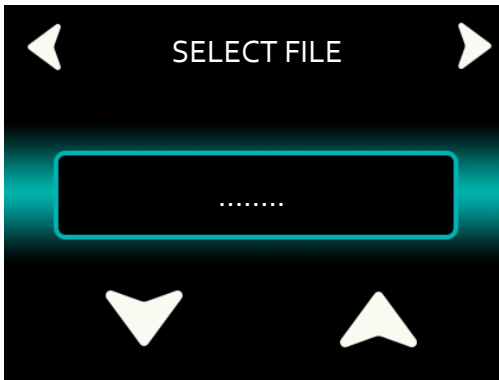


## 5.1. «PRINT» SECTION

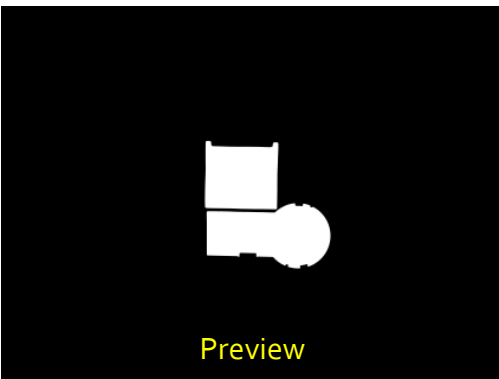


Here you can access two test files included in the firmware, or proceed to perform a normal print from the micro SD card.

Note: The test files have two fixed parameters: Bottom layers=5 and Transition layers=0.



Select the name of the folder with the sections saved in the root directory of the micro SD card.

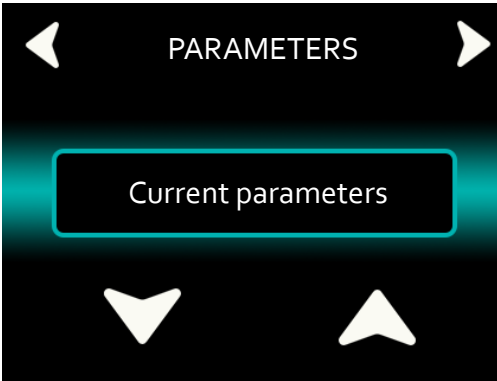


A quick preview of sections of the selected file is shown here. Interesting note: in this preview and during printing, the sections shown on the touchscreen display have the same shape and size as those shown on the mask display for printing.

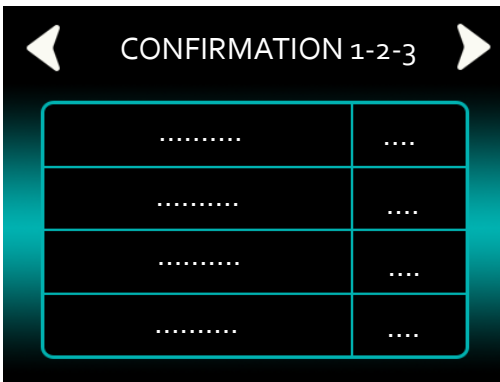




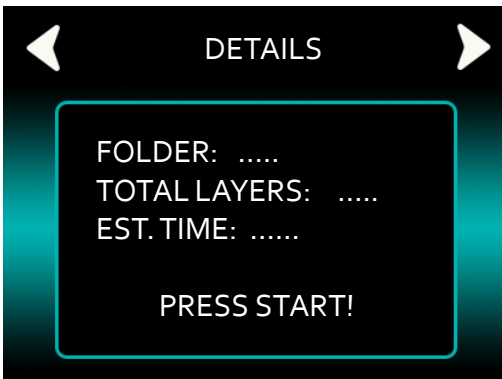
## 5.1. «PRINT» SECTION



The printing parameters are selected here: current (the set of parameters last modified), change them (which allows you to modify the 12 parameters) or the set of parameters stored in the memories (A-F).



A summary of the selected parameters is displayed on the three confirmation screens.



If the build platform is level, a correct preview was displayed and the parameters were selected, place the vat with resin and press the START /PAUSE button. (The estimated time here is an approximation and will be refined after the transition layers).



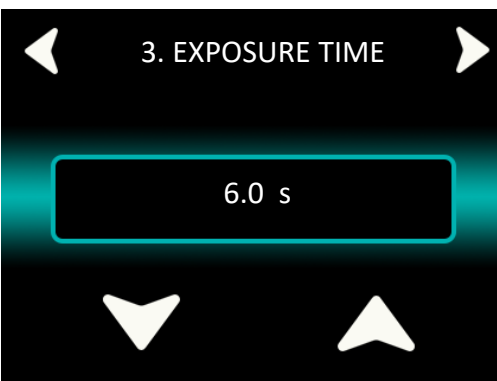
## 5. 2. «PARAMETERS» SECTION



The height of a single layer affects printing time: thinner layers require shorter exposures but result in more layers, making the overall printing time longer.



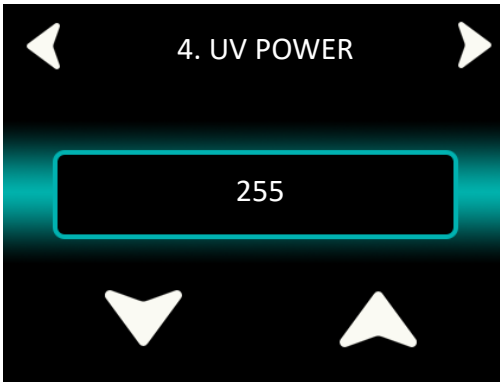
The printer uses longer exposures for the initial layers to improve adhesion to the build platform. Longer bottom layer exposure enhances model adhesion. (An excess will cause oversized sections).



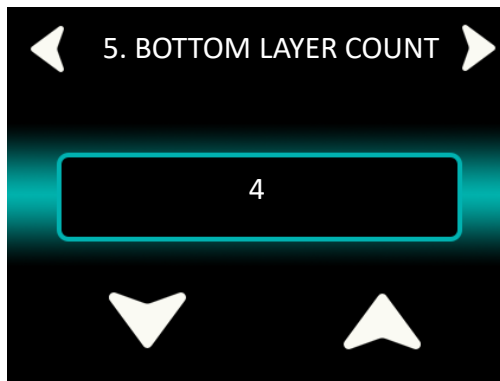
Normal layer exposure time, which determines how long resin is exposed to UV light to cure a layer, is crucial for the quality and success of a 3D print.



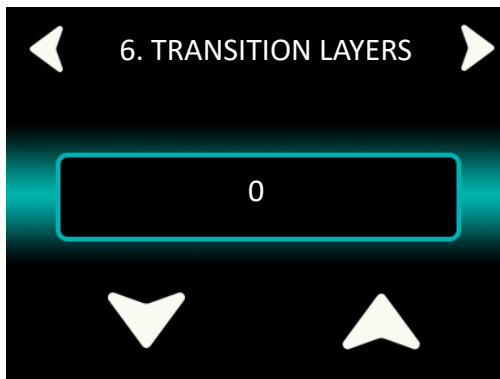
## 5. 2. «PARAMETERS» SECTION



Change the output power of the UV LED (0-255). More power means faster curing of the resin.



This parameter determines the number of layers exposed with a higher initial exposure time to ensure a strong foundation that adheres well to the build platform.



Transition layers gradually reduce exposure time between the bottom and normal layers, ensuring a smooth shift in curing times.





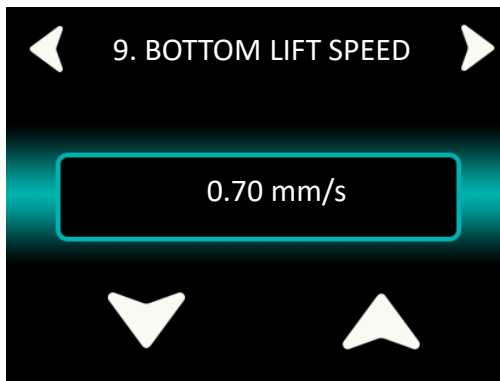
## 5. 2. «PARAMETERS» SECTION



Lift height is the distance the build platform moves up between layers to separate the printed model from the release film. For the bottom layers, a 50% higher height is recommended.



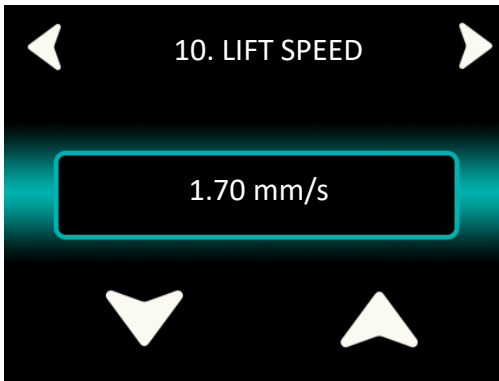
The ideal lift height should be sufficient to peel the printed model from the release film.



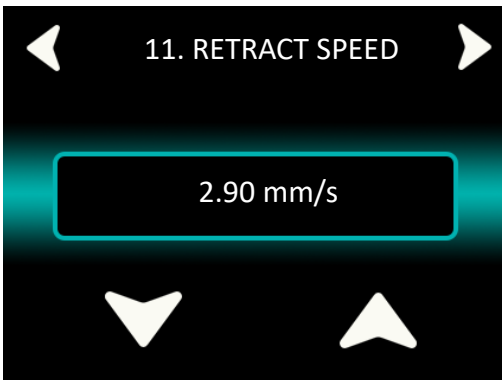
Lift speed determines how quickly the build platform rises after curing each layer, which also dictates the speed at which the model is peeled off the release film. A very slow speed is recommended for the bottom layers.



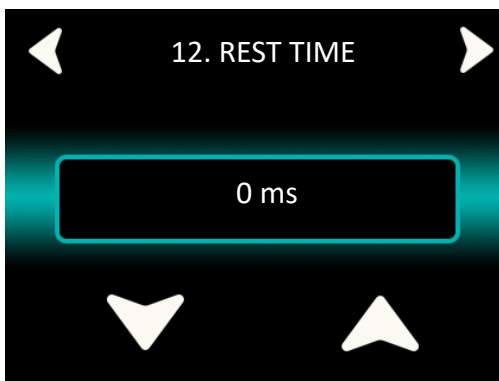
## 5. 2. «PARAMETERS» SECTION



Begin with a slower lift speed initially. As you gain confidence and achieve consistent good prints, feel free to experiment with faster lift speeds.



Retract speed is the rate at which the build platform descends into the resin vat. This speed generally has minimal impact on print quality, but if the speed is high the motor will be noisier.



This parameter introduces a delay in exposure after the build plate retracts to its lowest position, allowing the liquid resin to settle and form a continuous layer between the model and the release film.



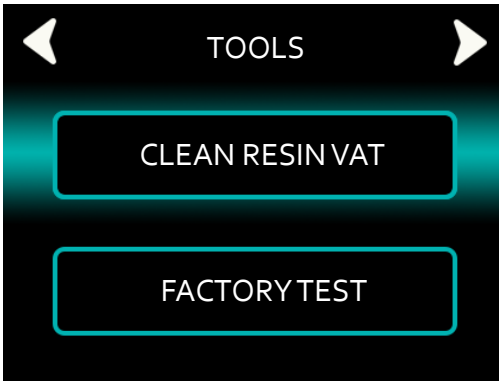
## 5. 2. «PARAMETERS» SECTION



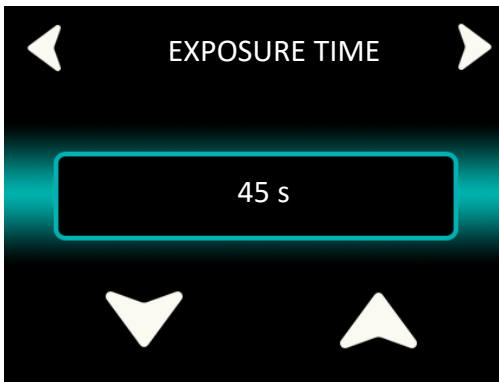
Here you can store all of the 12 previous parameters in one of the 6 permanent memories (A-F). The selected parameters are kept as "current parameters" until they are modified again, even if they are not stored in the memories.



### 5.3. «TOOLS» SECTION



With the "clean resin vat" tool you can solidify a thin layer of resin at the bottom of the vat. This layer can be easily removed, taking with it the impurities stuck to the release film.



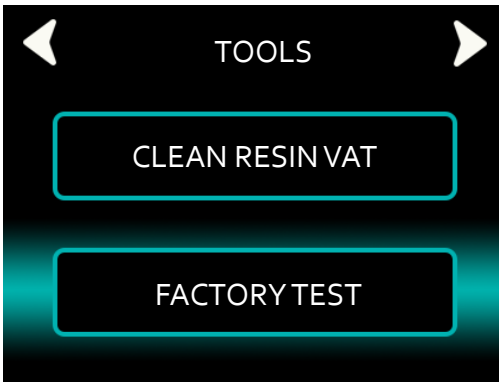
The exposure time must be long enough to cure a continuous layer of resin. (It has a value similar to or slightly higher than an "Initial exposure" for a 100 um layer).



Summary screen. Place the vat with enough resin and press the START/PAUSE button. During the selected time, a blank screen will be displayed and the UV light will be turned on at full power.



## 5.3. «TOOLS» SECTION



The "factory test" is designed to test the correct operation of the machine after assembly.



Before starting, remove the resin vat and the build platform from the machine. Press the START/PAUSE button and follow the instructions on the screen.



## 6. POST-PROCESSING

After printing is finished:

- Remove the printed parts from the build platform with a spatula, leaving it completely clean for the next print.

- Check the resin vat, and eliminate any remaining solid pieces adhered to the release film or floating impurities. This is especially important if the print failed for some reason. If necessary you can use the "Clean resin vat" tool.

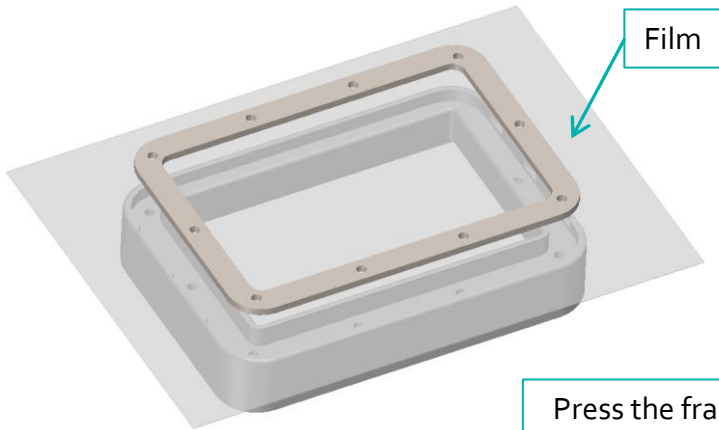
**CAUTION:** A dirty vat resin will prevent proper printing and may cause damage to the machine.

- Wash the printed parts inside and out with isopropyl alcohol or water, depending on the resin used. There should be no liquid resin left on the surface.

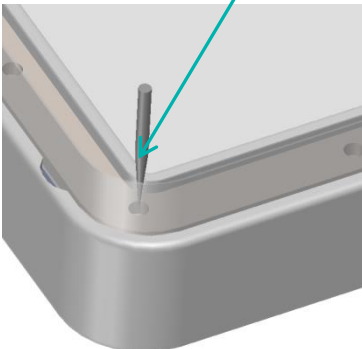
- Complete the curing of the parts by exposing them to 405nm UV light in a suitable cabin, or inside a transparent container filled with water exposed to sunlight.



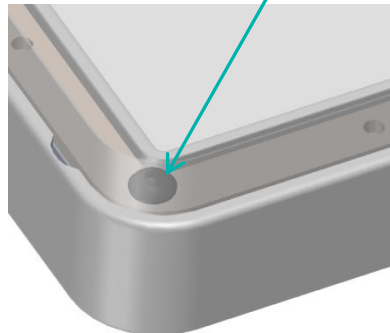
## 7. RELEASE FILM INSTALLATION



Puncture the film into frame holes

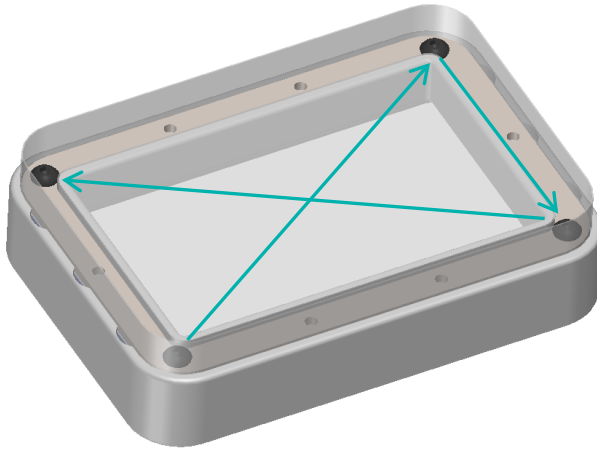


Insert the screw and tighten slightly

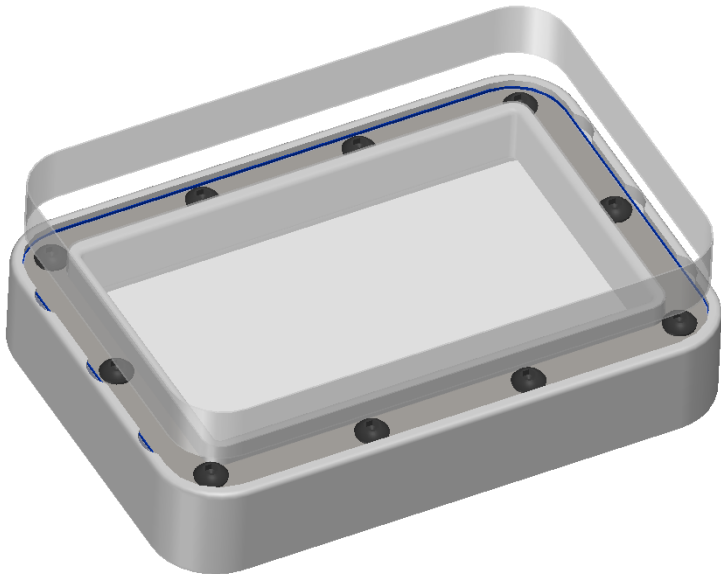




## 7. RELEASE FILM INSTALLATION



Continue with the opposite screws, lightly tightening



Once all the screws are in place, tighten sequentially.  
Cut the excess film with a box cutter.





## 8. SLICING

Before starting a print job, the model(s) must be sliced. To do this, you must use a slicer software: Prusa slicer, Voxeldance Tango, Chitubox, Lychee, etc. The only requirement for a slicer to be compatible is that it can output a compressed file (e.g., ZIP or CWS format) containing PNG images of the sections with one of the following name formats:

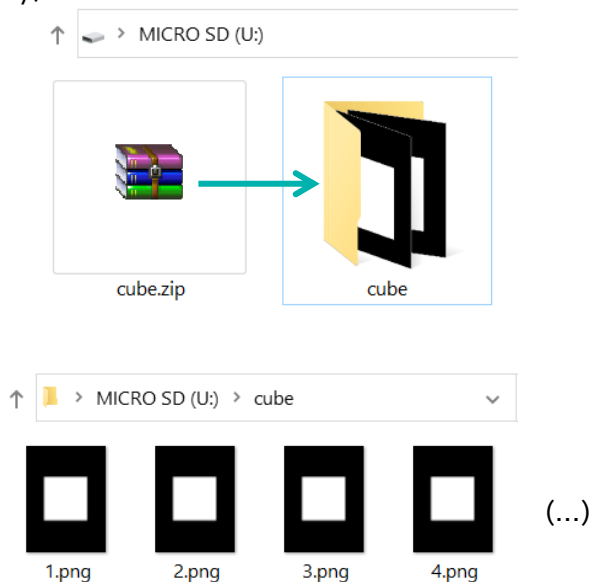
**Lychee:** lychee0000.png, lychee0001.png, ...; or lychee0000.png, lychee0001.png, ...

**Prusa slicer:** foldername000000.png, foldername000001.png, ...

**Voxeldance Tango:** 0.png, 1.png, ...

**Chitubox:** 1.png, 2.png, ...

The output files of the slicers must be unzipped and the obtained folders copied to the root directory of a micro SD card (The card must be in FAT32 format). The names of these folders are the ones that Lite3DP will show for selection in the PRINT section. (Note: For CWS format files (Lychee slicer), you can manually change the extension ".CWS" to ".ZIP" and proceed to unzip them normally).





## 8. SLICING

	CONFIGURATION
LAYER HEIGHT	0.025 mm
RESOLUTION (px)	X: 320 Y: 426
BUILD VOLUME	X: 36.720 Y: 48.883 Z: 80

To configure any Slicer software, the values in the previous table must be used. These are constants and should not be modified. You should always process files with layer height equal to 0.025 mm (when selecting 0.05 or 0.10 mm layer height, Lite3DP skips images during printing). The values of the other printing parameters included in the slicers will not affect the print job, since these are selected on the Lite3DP menu.

(For more details, a **Slicer configuration guide** is available on our Github).

Please review the documentation for the slicer of your choice. To achieve correct processing, you must open the 3D model(s), position and rotate them in relation to the build platform, generate the appropriate support structures and finally obtain the output file.

### Mini resin vat note:

No changes should be made to the configuration. You just have to make sure that the model is centered on the build platform and its size does not exceed 20 x 20 x 80 mm.



## 9. BEFORE STARTING

### Before first use:

- Install the release film on the resin vat according to section 7. Then, it is recommended to first fill the vat with water for half an hour and check that there are no leaks.
- Make sure to remove the transparent protective film from the mask display.
- Verify that the magnets are correctly located, so that when holding the vat, the release film is in contact and rests evenly on the mask display. If not, improve the location of the magnets until the vat is inserted correctly. (See section 10).
- Make sure your Micro SD card is formatted in FAT32.
- Verify that by adjusting the carriage hand knob screw, the platform is firmly attached. Otherwise, please see section 10.

### Before every use:

- Verify that the vat has no solid residue or damaged release film. At the slightest sign of damage, please replace the film. (As a tip, only use the plastic spatula to mix the resin and never exert any pressure on the release film, as it deforms and marks easily).
- Perform proper cleaning and leveling of the platform.



## 10. TROUBLESHOOTING

### Print issues

The Lite3DP Gen 2 is a very special 3D printer, but it shares the same printing recommendations with all other MSLA 3D printers. Nowadays there is abundant online information about common problems with this technology, from which you can learn typical causes and solutions.

We will not go into details here, but we can mention the typical causes of failures:

- Incorrect platform leveling.
- Resin vat with problems: dirty/expired/poorly mixed resin, dirty/damaged release film.
- Incorrect selection of parameters: Insufficient/too long exposure times. Very high lift speeds. Insufficient lift height. Insufficient bottom and/or transition layers.
- Defective slicing: poor positioning or orientation of the parts, insufficient/incorrect support structures, incorrect hollow, among others.
- Damaged Micro SD card or not formatted to FAT32.

In most cases the solutions are experimental, they must be solved through trial and error.



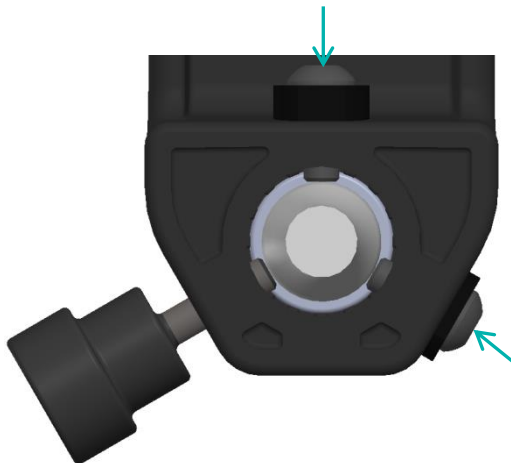
## 10. TROUBLESHOOTING

### Machine issues

1. The main mask display is composed of a customized LCD panel with a protective glass, adhered by a special glue film. This glue film is provided along with the glass and can be glued manually, and even removed and re-attached as long as no dust particles get in the way.

If the mini build platform is leveled too low (too tight with respect to the glass), the centered force may cause some bubbles to appear on the periphery of the active area of the display. This case has a simple solution, by applying light pressure on the glass and sliding a finger from the center to the outside, the bubbles will disappear. And of course, re-level the mini build platform further away from the glass.

2. The build platform must be able to be firmly attached to the carriage. If you notice that the fit is not good, it may be necessary to make a small adjustment to the two carriage screws, so that the spherical head is centered in the magnet when tightening the hand knob screw.

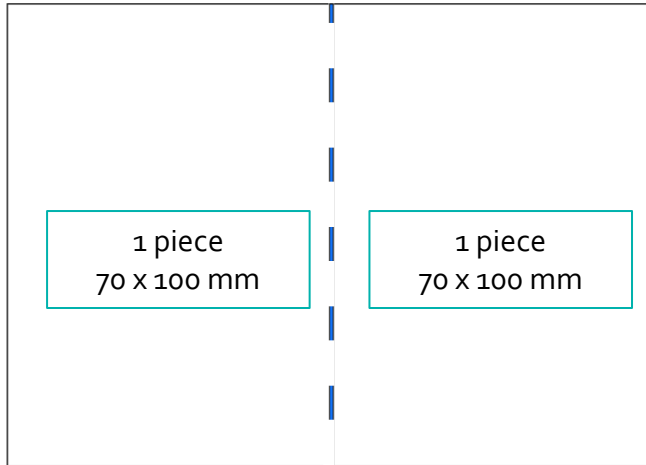


## 10. TROUBLESHOOTING

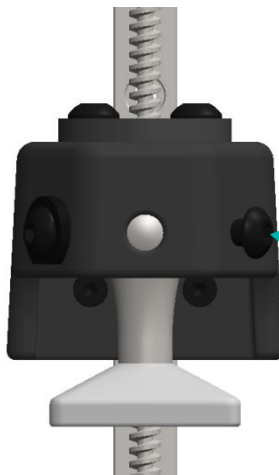
### Machine issues

3. The resin vat must be able to be placed on the magnets in such a way that the release film is completely in contact with the display glass. If this doesn't happen, you can loosen the screw on the magnet that you think is out of place, adjust the magnet, and retighten the screw.
  
4. Along with the machine accessories, three sets of washers are included, which are not initially necessary. If you think it is necessary, and as long as the release film of the resin vat is in contact with the display glass, you can add a set of washers (0.1, 0.2 or 0.3 mm) under the 4 magnets (between the magnets and the PCB). In this way, the magnets are brought closer to the vat frame, increasing their holding force.

## 11. MINI RESIN VAT & BUILD PLATFORM



Prior to installing the film in the mini resin vats, cut the films provided (100 x 140 mm) into 2 pieces of 70 x 100 mm. Beyond that, the procedure is similar to that of standard vat, according to section 7.

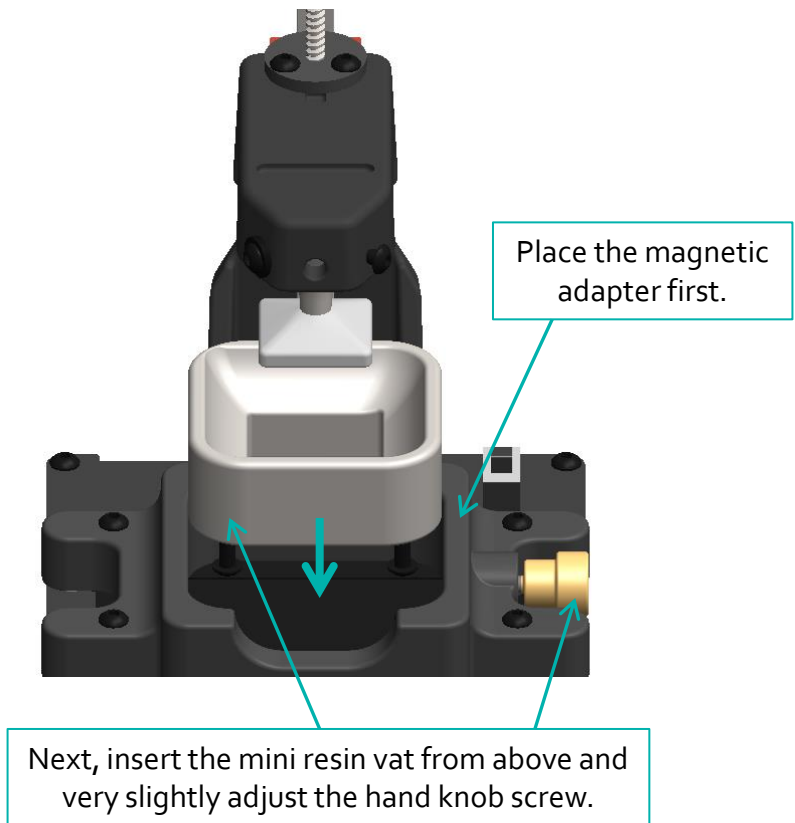


Remove the hand knob screw and replace it with the provided M3 x 10 screw. This screw will allow you to adjust and release the mini build platform using the 2mm allen key. (The hand knob screw collides with the mini resin vat).

## 11. MINI RESIN VAT & BUILD PLATFORM

Leveling is done in the same way as the standard build platform, see section 4. The only thing that changes here is that a 2 mm Allen wrench is needed to loosen and tighten the M3x10 screw that replaces the hand knob tightening screw.

The mini vat is positioned as follows:







## 12. USER NOTES

RESIN →	Initial			
1. LAYER HEIGHT (um)	100			
2. INITIAL EXPOSURE (s)	40			
3. EXPOSURE TIME (s)	6.0			
4. UV POWER	255			
5. BOTTOM LAYER COUNT	5			
6. TRANSITION LAYERS	0			
7. BOTTOM LIFT HEIGHT(mm)	6.00			
8. LIFT HEIGHT (mm)	4.00			
9. BOTTOM LIFT SPEED (mm/s)	0.70			
10. LIFT SPEED (mm/s)	1.70			
11. RETRACT SPEED (mm/s)	2.90			
12. REST TIME (ms)	0			

## 12. USER NOTES

RESIN →				
1. LAYER HEIGHT (um)				
2. INITIAL EXPOSURE (s)				
3. EXPOSURE TIME (s)				
4. UV POWER				
5. BOTTOM LAYER COUNT				
6. TRANSITION LAYERS				
7. BOTTOM LIFT HEIGHT(mm)				
8. LIFT HEIGHT (mm)				
9. BOTTOM LIFT SPEED (mm/s)				
10. LIFT SPEED (mm/s)				
11. RETRACT SPEED (mm/s)				
12. REST TIME (ms)				

[illegible]