

Sinterit Lisa printer

SHORTENED USER GUIDE



Read the instruction manual before starting the device.



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The Shortened User Guide is a shortened version of the Sinterit Lisa printer User Manual. For correct and trouble-free operation of the printer, please read the Full User Manual available at www.sinterit.com.

Sinterit is not responsible for printer failures caused by not reading the full manual.

Listed below are descriptions of symbols used on the device. They constitute a warning or convey the information to protect the user, other individuals or surrounding objects and ensure the correct and safe use of the device.

	<p>WARNING! An inevitably dangerous situation which can result in serious injury or even death. Initiation, an omission of a specific procedure or inattention can cause severe physical injury to the user.</p>
	<p>CAUTION! IR laser radiation. Looking directly into the laser beam can cause blindness and skin burns. The laser emits infrared radiation (infrared, IR), which is invisible to humans. Avoid eye or skin exposure to direct or scattered radiation. Do not stare into the beam or view with optical instruments. CLASS 1 LASER PRODUCT IEC 60825-1 Ed.3(2014)</p>
	<p>CAUTION! Beware of sharp edges which can cause body cuts and injury.</p>
	<p>STOP! Action prohibited.</p>
	<p>IMPORTANT! Information essential to correctly perform a specific task.</p>
	<p>ATTENTION! It is necessary to wear Protective Gloves and Protective Dust Mask. Mandatory action when working with powder.</p>
	<p>IMPORTANT! You must <u>read the full version</u> of these instructions before taking action. Available on www.sinterit.com</p>



1. Sinterit Lisa printer

A. SHORTENED DESCRIPTION

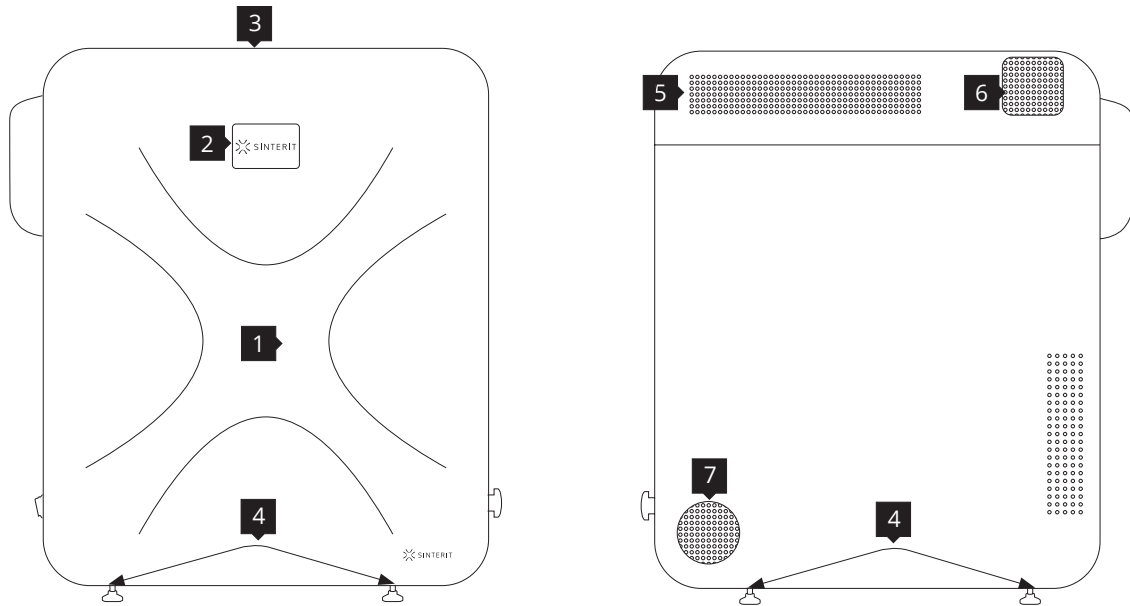


Image 1. View of the printer's front and back side.

- 1.Removable Front Panel / 2.LCD touch screen with camera view / 3.Viewing window / 4.Adjustable Mounting feet / 5.Printer lid / 6.Lid fan / 7.Base casing ventilation**

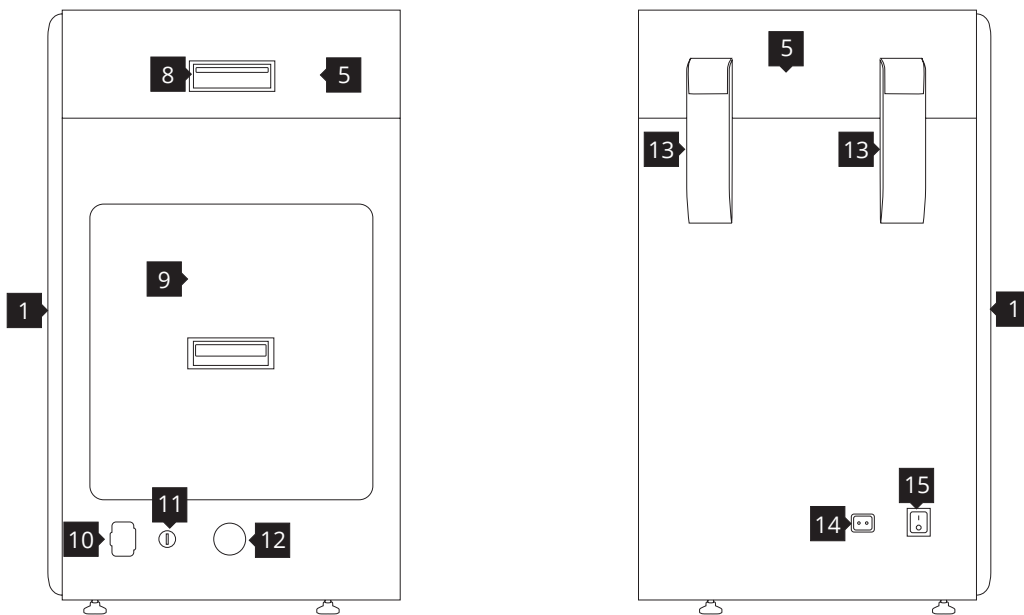


Image 2. View of the printer's right and left side.

- 8.Lid's handle / 9.OVERFLOW BIN / 10.USB port / 11.Key slot / 12.Emergency Stop Button (E-STOP) / 13.Lid's hinges lid / 14.Power socket / 15.Power switch (On/Off)**

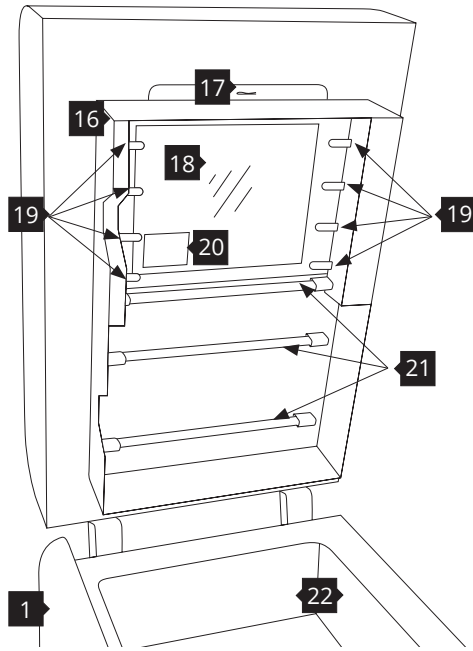


Image 3. View of the printer's Heating module.

16.Heating module / 17.Split pin / 18.LASER PROTECTIVE GLASS / 19.Short Infrared heaters (white) 4 pieces on each side / 20.Laser system / 21.Long Infrared heaters (red) 4 pcs. / 22.Print chamber

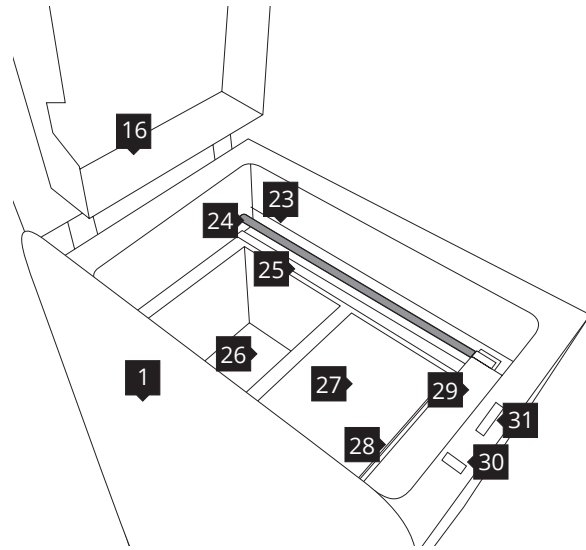


Image 4. View of the printer's Print Chamber.

23.RECOATER drive unit cord / 24.RECOATER guide bar / 25.RECOATER cord (short) / 26.FEED Bed / 27.PRINT Bed / 28.OVERFLOW BIN gap / 29.RECOATER / 30.OVERFLOW BIN bolt / 31.Lid electromagnetic lock

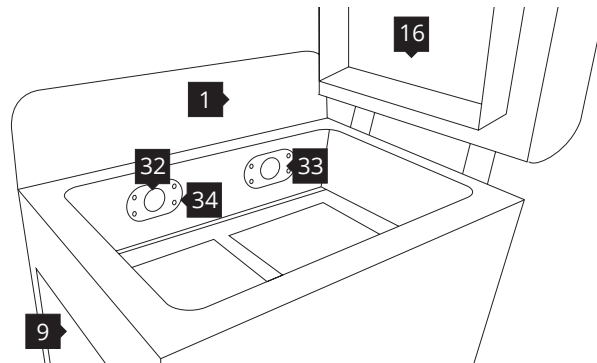


Image 5. Back view of the printer's inner chamber (view of the pyrometers).

32.PRINT Bed pyrometer/ 33.FEED Bed pyrometer / 34.Embedded camera (captures image from the PRINT Bed)

2. Preparing the machine to print

A. INSTALLING / CLEANING THE LASER PROTECTIVE GLASS



CAUTION!

Beware of sharp edges. Put on the Protective Gloves in order to protect yourself from injuring the hand against the edge of the Heating module.

1. Turn on the printer. Switch the Power Switch **15** from "0" to "1".
2. Check the Emergency Stop Button **12**. Twist to unlock if needed.
3. Turn the printer on with the Ignition key **11**.
4. Wait until the main menu with four buttons appears on the LCD screen (it takes about 20 seconds).
5. To open the printer's Lid **5**, press: "START NEW PRINT" // "UNLOCK LID" buttons on the LCD screen (Image 6). The Lid's electrolock deactivates for 10 seconds. After 10 seconds, it will re-activate.

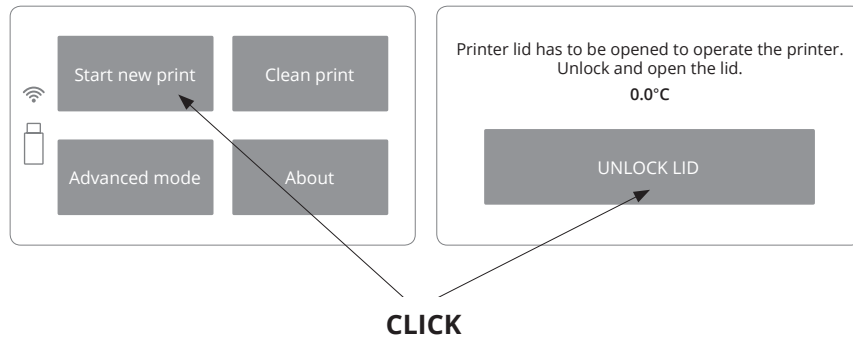


Image. 6. Open Printer Lid.

6. Softly press the Lid and then lift it using Lid's handle **8**. Be careful! The Lid is quite heavy.
7. We recommend to turn off the power of the device (turn off the Ignition key).
8. While holding the Heating module **16**, take out the Split pin **17** positioned on the top of the inner part of the Lid (Image 7).
9. Lower the Heating module to get access to the place dedicated to the LASER PROTECTIVE GLASS **18** (Image 8).

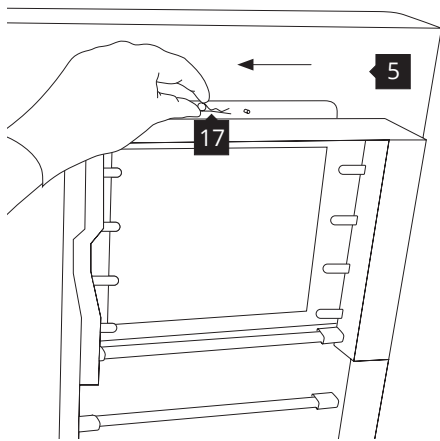


Image 7. Heating module - removing the Split pin.

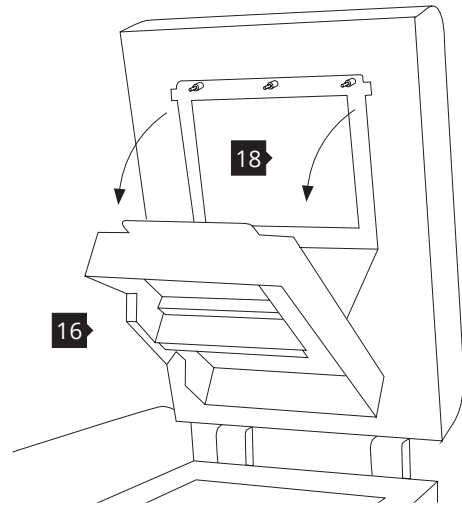


Image 8. Heating module - opening.

10.

Installing

- a. Remove the LASER PROTECTIVE GLASS module **18** from the box (inside the Box with additional accessories).

Cleaning

- a. Holding the LASER PROTECTIVE GLASS module, unscrew two wingnuts **35** at the right side (Image 9).
- b. Remove the module from the locking holders **36** located on the left side of the Lid.

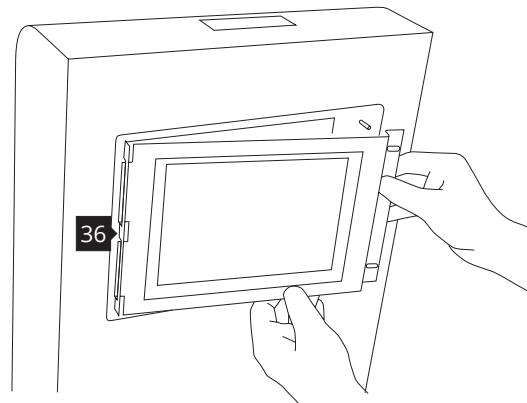
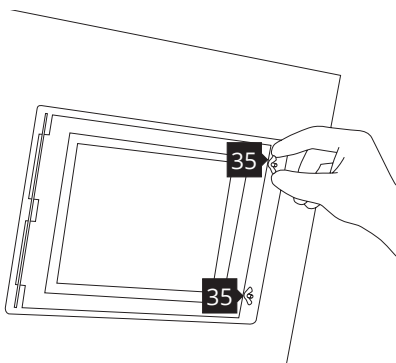
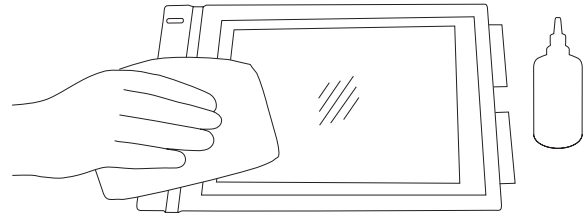


Image 9. Correct unmounting of the LASER PROTECTIVE GLASS.



11. Rub the surface of glass carefully with a cotton cloth soaked with 2% salicylic spirit (ethanol solution) or any other ethanol-based solution. **Do not use isopropyl alcohol!** Pay attention to any fibres left on the surface. Clean both sides (Image 10).



Remember to wipe the LASER PROTECTIVE GLASS with a dry piece of cloth afterwards.

Image 10. Cleaning of the LASER PROTECTIVE GLASS module.

12. Mount the glass: holding the glass behind the metal frame, slide the tabs into the holes on the left side **36**, press gasket gently, after obtaining the perfect fit, screw the wingnuts **35** bolt on the right side (Image 11).

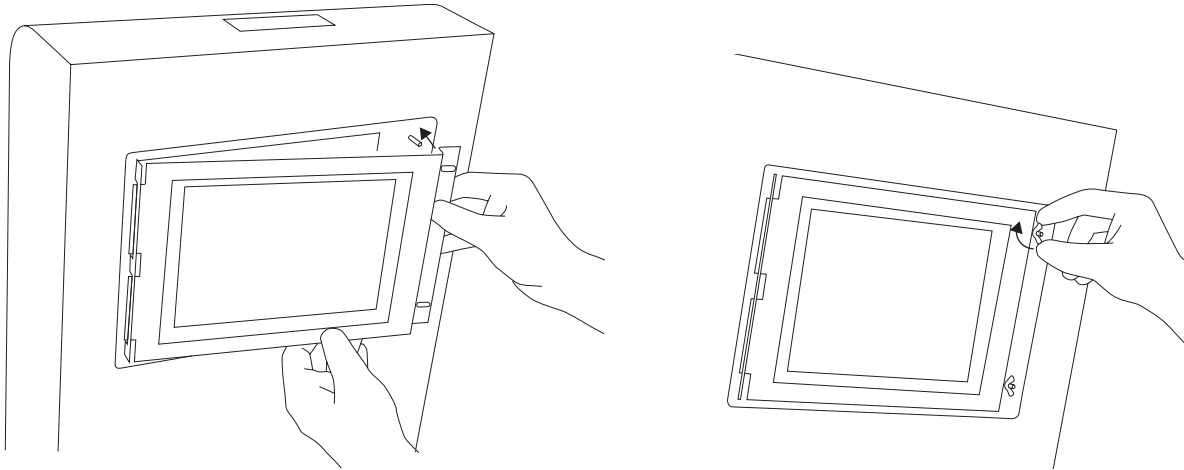


Image 11. Correct placement of the LASER PROTECTIVE GLASS on the Heating module.

13. Join the Heating module with the Lid – using the metal Split pin (Image 12).
14. Clean the Glass one more time from any finger marks or stains if present.

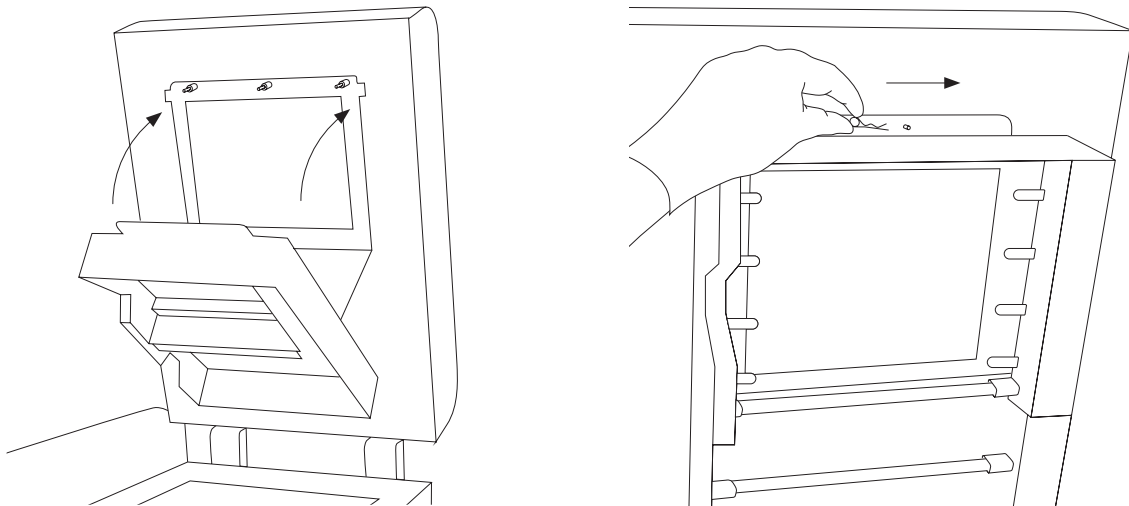
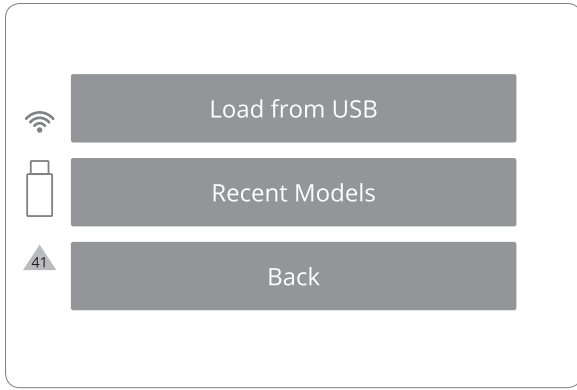


Image 12. Correct closing of the Heating module.

15. The printer is ready to work. Turn the printer on and let's get started!



IMPORTANT!
 A yellow triangle displayed on the side of the screen informs about a malfunction.
 Please contact the Support Team (section 7, page 15) by referring to the code displayed inside the warning triangle and providing the serial number of the device.

3. Printing – STANDARD MODE

1. To start, click the “START NEW PRINT” button on the LCD screen.
2. Press “UNLOCK LID” button to open the printer Lid (Image 13).
Remember: The Lid’s electrolock deactivates for 10 seconds. After this time, it will re-activate).
3. Softly press the Lid and then lift it.
4. Load the file to print:
 - a. save the file (*.score) prepared using the Sinterit STUDIO to a USB Flash Drive.
 - b. Connect the storage to the printer’s USB port **10**, with its power turned on.
5. After connecting the Flash Drive into a USB port, “LOAD FROM USB” section will be displayed and a Flash Drive icon will appear on the left side of sections (Image 14).

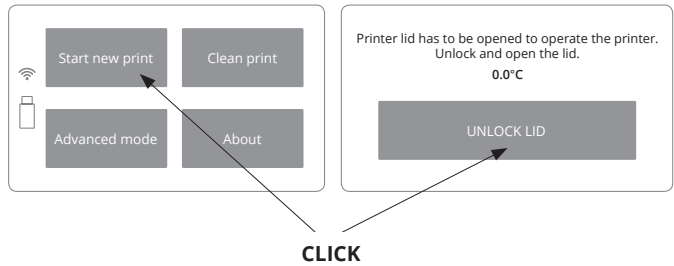


Image 13. Open Printer Lid.

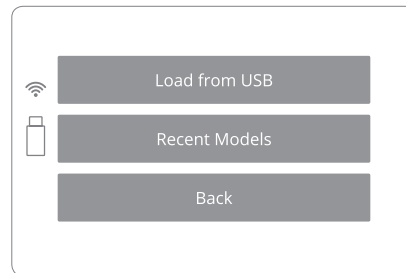


Image 14. A screen showing a USB connection to the printer.

IMPORTANT!
 After uploading the model to the printer’s internal storage, printed projects can be chosen from “RECENT MODELS”.

6. Titles of project files will be displayed. Arrows will help to navigate through folders and files (Image 15).
7. After choosing a file, it will be loaded into the device’s memory.

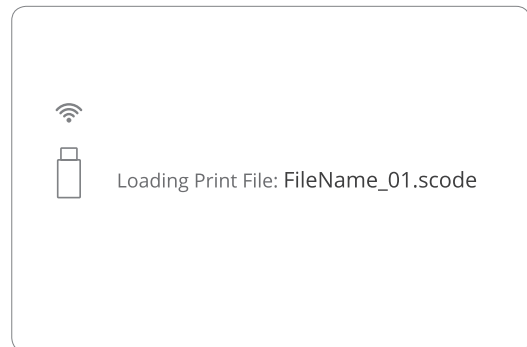
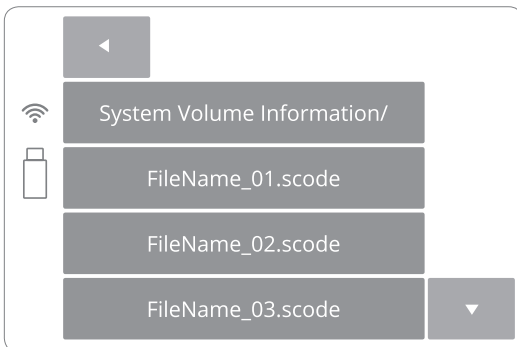


Image 15. Loading the print file screens.



- The loaded file will show basic information such as the file's name, material and expected printing time. Flash Drive can be then safely removed (Image 16).
- The software will allow to return to the previous section or proceed to the next. After choosing the next section, Lisa Printer will check whether it is ready to print.

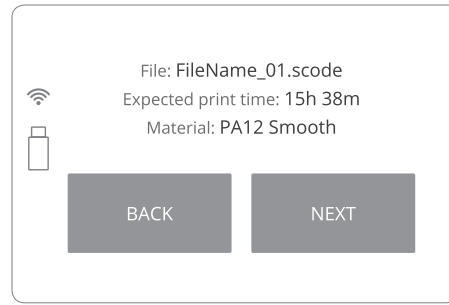


Image 16. Basic information after loading the file to the printer.



WARNING!

Carefully read all messages displayed on the screen while preparing the machine for printing. Skipping any of the described operations may result in incorrect printing or machine failure.

10. First use of the printer

- If the machine is filled with powder for the first time, after loading the file, a message will appear that the LASER PROTECTIVE GLASS needs to be cleaned. Confirm by clicking the "DONE" button.
- Next, "POSITIONING BEDS FOR PRINTING" message will appear.

Subsequent use of the printer

- When printing again, after confirming the message that the last printout has been removed, another message will be displayed indicating that the PRINT Bed has probably not been cleaned. If the machine has been cleaned earlier (by the clean printer process), there will be no message.
- Next one, "POSITIONING BEDS FOR PRINTING" message will appear.

- By clicking "DONE" button the RECOATER **29** and the BEDS **26** **27** will be repositioned (Image 17). During this operation, the height of both BEDs is set in accordance with the currently selected printing process (Image 18).

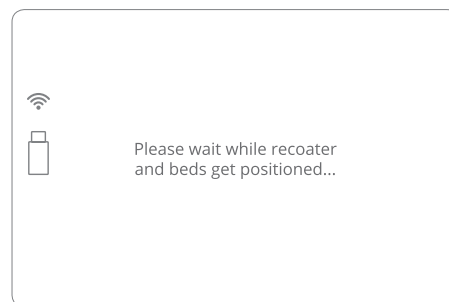
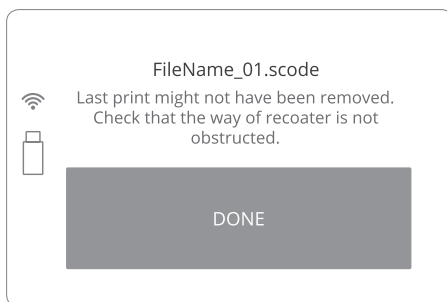


Image 17. The positioning of the BEDs and the RECOATER screens.

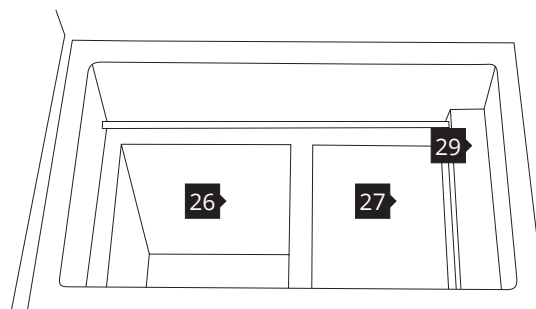


Image 18. Repositioned BEDs: PRINT Bed **27** and ready to be filled with powder FEED Bed **26** and the base position for the RECOATER **29**.



IMPORTANT!

- When working with powders always wear protective clothing (glasses, mask, gloves).
- For the first use of the Sinterit Lisa Printer use only the powder (for PA 12 SMOOTH and PA 11 ONYX) from the container labeled Print Ready Powder.
- Always pay attention to the messages displayed on the LCD screen **2** of the printer.

12. After the BEDs repositioning process is finished, you will be asked to fill the FEED Bed **26** with powder (PA 12 SMOOTH Print Ready Powder or one from the TPU group, pour maximum 6[L] – Image 19 and 20).
13. Press powder slowly, but decisively using a trowel (from Box with additional accessories). Act carefully in order for the powder not to go airborne (it is recommended to use a spatula for adding the powder, Images 21 and 22).

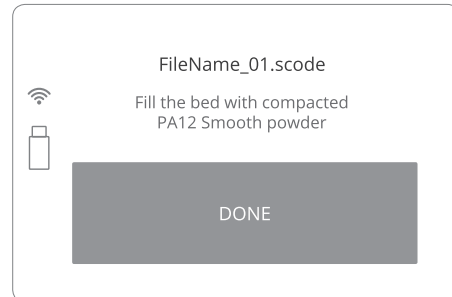


Image 19. Fill the FEED Bed screen.

14. It is also recommended to add a little bit of the chosen powder on the surface of the PRINT Bed **27**. This will make creating the first layer during positioning faster (Image 22). Press “DONE” button when you finish.
15. Clean any excess powder from the area around the BEDs, the RECOATER guide bar **24** and the cords of the RECOATER **23** **25**, using a paintbrush.

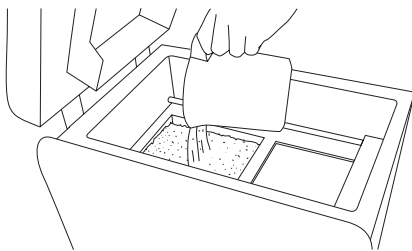


Image 20. Adding powder to the FEED Bed.

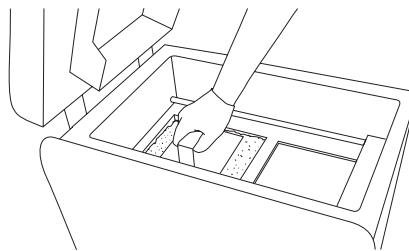


Image 21. Compacting powder by gently pressing it.

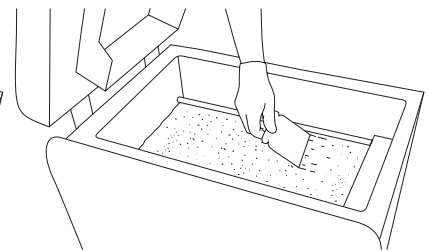


Image 22. Equal distribution of powder on both BEDs.

16. To level the powder inside the printer, click the „START LEVELING” button (Image 23).

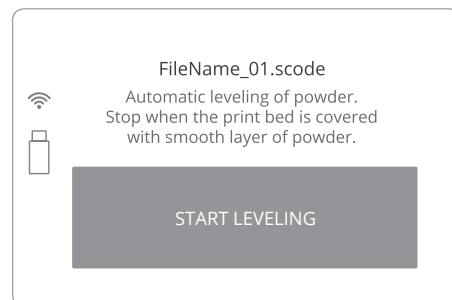


Image 23. START LEVELING screen.

17. Once both BEDs are covered with a smooth layer of powder, press “LEVELING DONE” on the screen (Image 24). The RECOATER will return to its default position (Image 25).

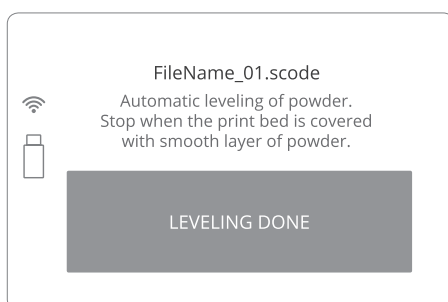


Image 24. LEVELLING DONE screen.

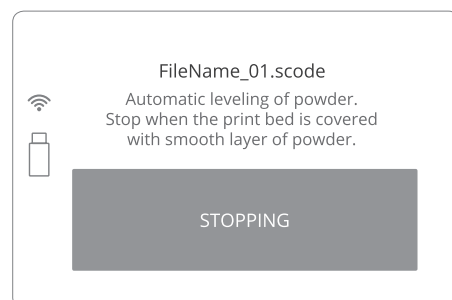


Image 25. Information screen while the levelling is being stopped.



18. When the levelling is done and the RECOATER has returned to its default position, the cleaning process must be initiated.

- Clean the Infrared Heaters (short **19** and long ones **21**), use a brush or clean and dry cotton cloth.
- “CAREFULLY CLEAN THE VISION WINDOWS OF THE CAMERA AND PYROMETERS” message image will appear (Image 26). Use a soft cloth soaked with alcohol (ethanol or salicylic spirit 2%) and to very carefully clean the windows of the PRINT Bed pyrometer **32** and FEED Bed pyrometer **33**. Wipe both windows dry.
- After that, carefully clean the RECOATER guide bar. Also, use a soft cloth soaked with ethanol (Image 27).
- Lubricate the RECOATER's bearing system and guide bar with the included silicone oil (Image 28).
- Confirm by clicking the “DONE” button after you do all of the steps.

19. Ensure that no items left inside the printer and gently close the Lid (Image 29).

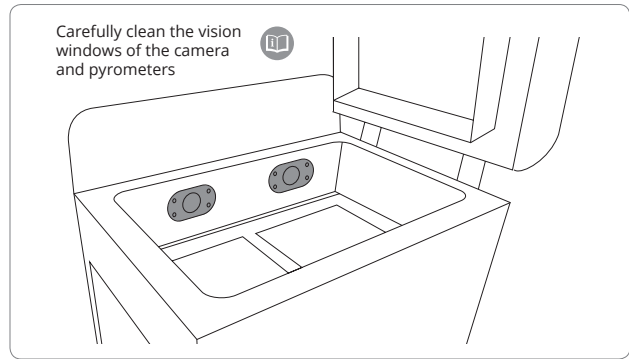


Image 26. Clean the pyrometers window screen.

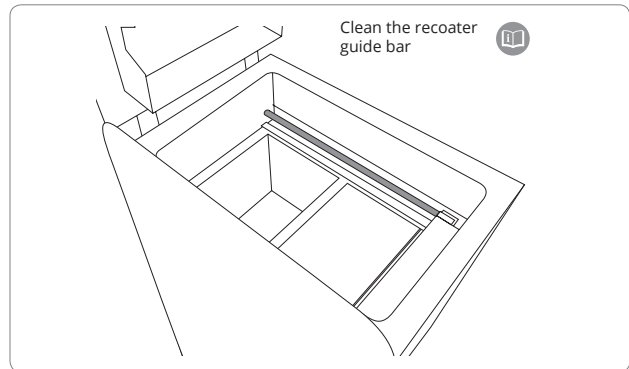


Image 27. Clean the RECOATER guide bar screen.

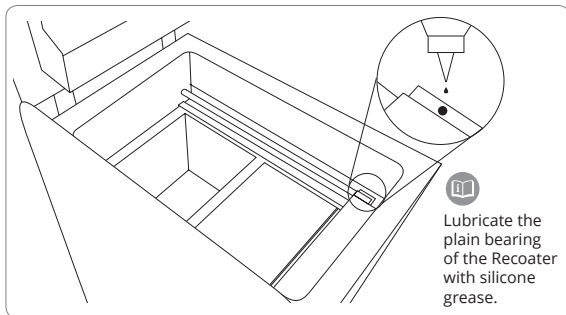


Image 28. Lubricate the RECOATER bearing system screen.

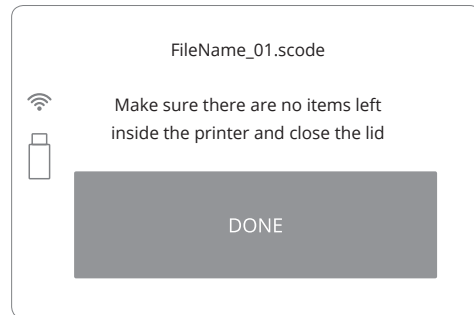


Image 29. Finalizing preparations for printing screen.



IMPORTANT!

If the quality of the distributed powder is unsatisfying, close the Lid and press the “BACK” button on the LCD screen. Unlock Lid and start the Leveling process again.

20. Press “START PRINTING” button on the LCD screen and the printing process will start (Image 30).

21. The process will start with a slight delay (not immediately after pressing the button).

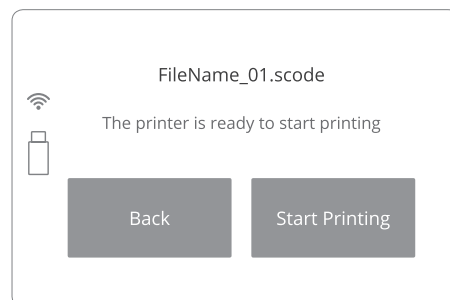


Image 30. Start printing screen.



4. Information and tasks while printing

1. The information displayed on the main screen while printing (in real-time):
 - the status of the print (in percents),
 - the current temperature of the PRINT Bed,
 - warming and cooling states,
 - the remaining time of laser sintering (Image 31).
2. Clicking on the “CAMERA” button activates the internal camera view, which will be displayed for 10 seconds. After that, the display will return to the main screen (Image 31).
3. During printing, if visible problems appear, observed by means of the internal camera or top Viewing window

3.

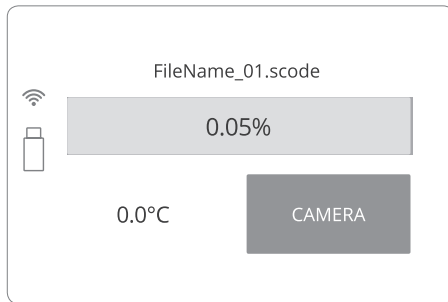


Image 31. The main screen during printing.

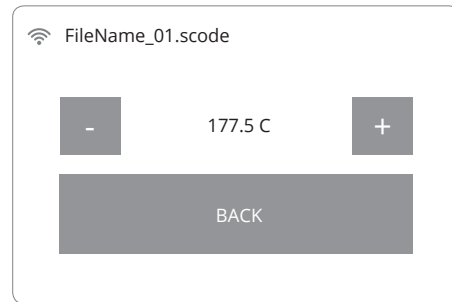


Image 32. Temperature control screen.

5. Finishing the print



IMPORTANT!

- The Lid's electrolock will stay active until the print chamber temperature will not drop below 50 [°C].
- There is no possibility to open the Lid before the temperature drops below an acceptable value.
- Remember that the content of the PRINT Bed may still be hot, despite the fact that the printer has cooled down!

1. When the printing process is complete, a message appears that the Lid must be opened (Image 33).
2. Press “UNLOCK LID” button on the LCD screen to open the Lid. **Remember:** The Lid's electrolock deactivates for 10 seconds. After this time, it will re-activate).
3. Softly press the Lid and then lift it.
4. By clicking the “REMOVE PRINT” button and then “REMOVE PRINTOUT”, the cleaning process will begin (Image 34).
 - By clicking “MAIN MENU” the system will return to the first screen.
5. Check that the way of the RECOATER is not obstructed. Confirm with the “DONE” button.
6. The BEDs and the RECOATER will change position. The PRINT Bed will raise, enabling the printout to be taken out from the chamber.
7. When this process is complete, “YOU CAN NOW REMOVE THE PRINT FROM PRINTER” message will appear on the screen. Click “DONE” to complete the printing process (Image 35).

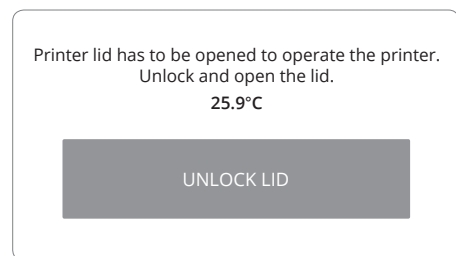


Image 33. Unlock lid screen.

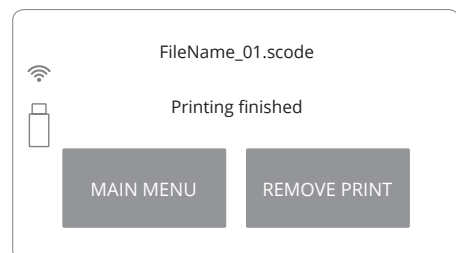


Image 34. Removing a printout screen 1.

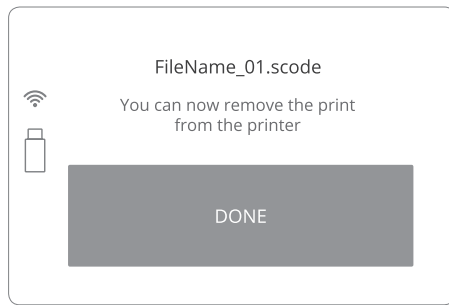


Image 35. Removing a printout screen 2.

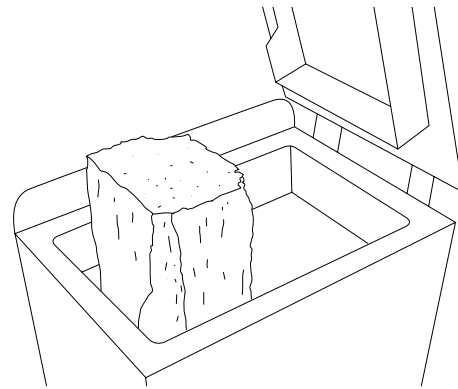


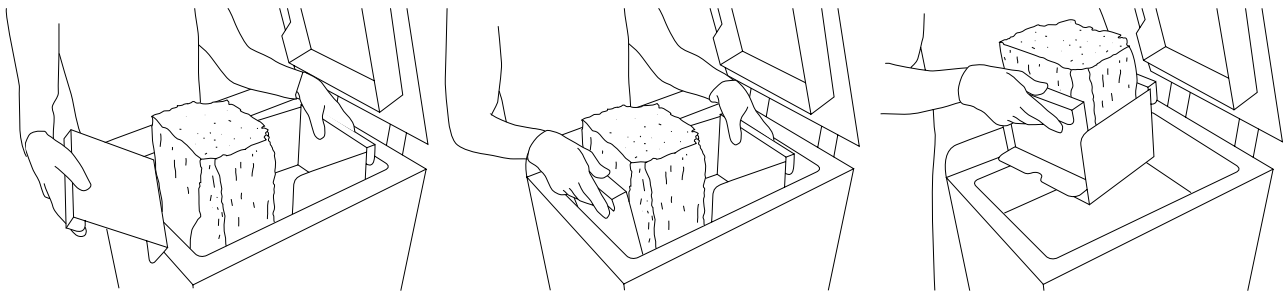
Image 36. Correct condition of the BEDs content after printing (visible cracks on the surface).



IMPORTANT!

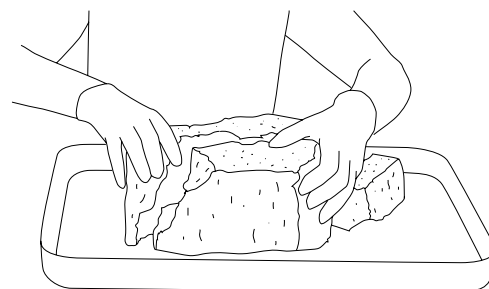
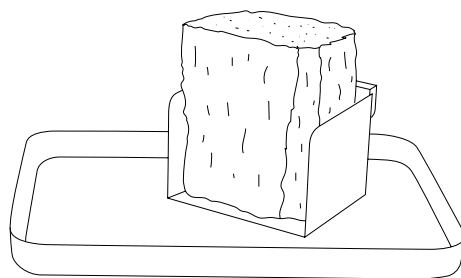
Put on the protective clothing included in the set (mask, glasses and gloves).

8. Remove the printout using two plates for carrying the printouts and carefully transfer it to the tray (Image 37). All tools are included in the Box with additional accessories.



Images 37. The correct way of taking out printouts from the PRINT Bed.

9. Leave the content with the printouts to cool down, for at least one hour (Images 38).



Images 38. Cooling the printout.

10. Remove the unsintered powder from the OVERFLOW BIN **9** (Image 39).
 - a. Unlock the OVERFLOW BIN - lift and hold the OVERFLOW BIN locking bolt **30**.
 - b. Remove the OVERFLOW BIN with the contents at the same time.
11. Transfer unsintered powder to the container/tray in which it will be mixed, with the Fresh Powder – for PA powder (Image 40).
12. Place the OVERFLOW BIN back in its place. Confirm with the "DONE" button (Image 39).

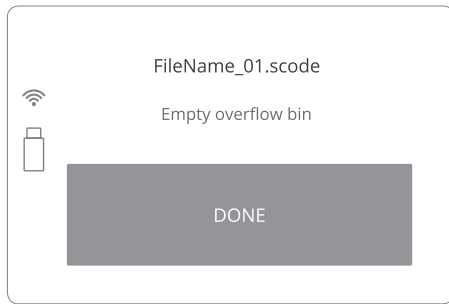


Image 39. The OVERFLOW BIN cleaning screen.

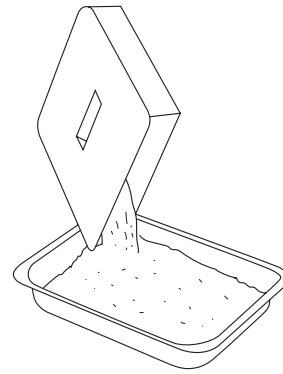


Image 40. Correct cleaning of the OVERFLOW BIN.

13. Next, the information about refreshing the remaining unsintered powder will appear.
 - The quantity of Fresh Powder (for PA12 and PA11) needed to be added for the next print will be displayed on the screen (Image 41).
 - This information is also available in the Sinterit STUDIO report after preparing the file for printing (SLICE tab).
14. Next steps will guide you through the printer cleaning process. It allows recovering all of the remaining unsintered powder.

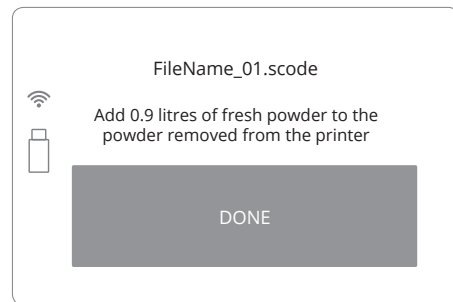


Image 41. Screen with information about how much of Fresh Powder needs to be added for the next print.



IMPORTANT!

- Always pay attention to the messages displayed on the LCD screen. Not acting according to the messages may result in the following print being incorrect.
- The Sinterit STUDIO software also calculates the amount of Fresh Powder, which needs to be added to that recovered from the printer.
- Even if you do not intend to make the following print right after the previous one, mix both powders immediately after recovering the unsintered powder from the printer in the proportions given by the Sinterit STUDIO software. Store it in a container for the Print Ready Powder.

6. Cleaning the printer

The system will guide you through the process of cleaning the printer right after printing. You can also do it later, by using the CLEAN PRINTER option displayed in the main menu. All actions should be confirmed by pressing the "DONE" button.

1. Remove and clean the LASER PROTECTIVE GLASS (Image 42). It is recommended to clean the glass before and after each print. To clean the glass, follow the instructions from section 2A in this manual ("Installing/cleaning the LASER PROTECTIVE GLASS").
2. Place the glass back in its place and then confirm all actions by pressing the "DONE" button.

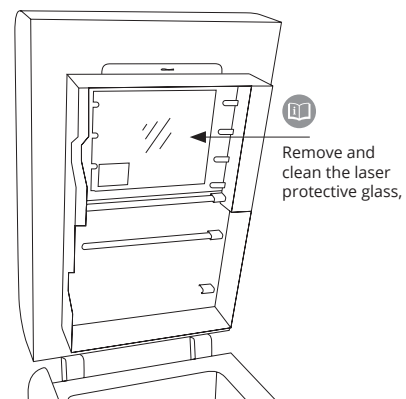


Image 42. LASER PROTECTIVE GLASS cleaning screen.



STOP!

- Watch out for the elements of the Heating module of the machine.
- Do not clean the glass under running water!
- The cleaning process should be carried out outside of the machine.

3. "FEED BED MIGHT NOT HAVE BEEN CLEANED AFTER LAST PRINT" message will appear.
4. Confirm it by pressing "CLEAN FEED BED" button (Image 43).
5. Check that the way of the RECOATER is not obstructed. Confirm with the "DONE" button.
6. The BEDs and the RECOATER will change position. The PRINT Bed will be lowered and the FEED Bed will be raised.

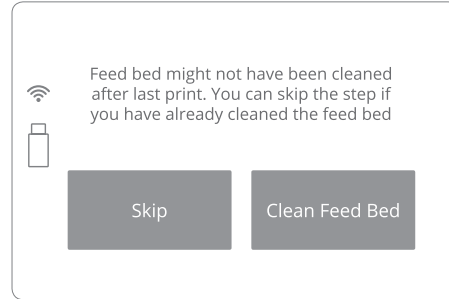


Image 43. Clean FEED Bed screen.

7. Precisely clean the FEED Bed from the remaining unsintered powder including the BEDs surroundings and placed into the PRINT Bed. Use the scoop, brush and spatula (Image 44).
8. "DONE" button can be pressed if cleaning process had been already done.
9. Next, the "PRINT BED MIGHT NOT HAVE BEEN CLEANED AFTER LAST PRINT" message will appear.
10. Confirm, by pressing "CLEAN PRINT BED" button (Image 45).
11. Ensure that the workspace of the RECOATER is not obstructed and remove all objects from the printer chamber. Confirm by clicking "DONE" button (Image 46).
12. The RECOATER and the PRINT Bed will change position. The PRINT Bed will be raised.
13. Thoroughly clean the PRINT Bed from the remaining unsintered powder including the BEDs surroundings. Move it to the OVERFLOW BIN through the gap. This can be done with the use of a spatula and paintbrush (Image 47).

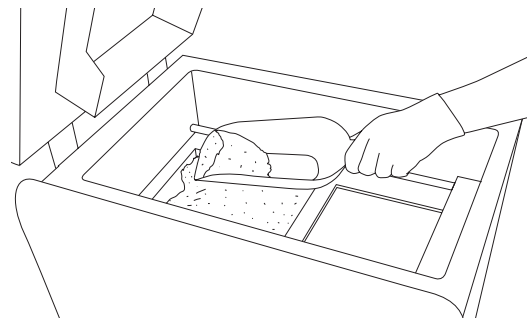


Image 44. Removing the powder from the FEED BED.

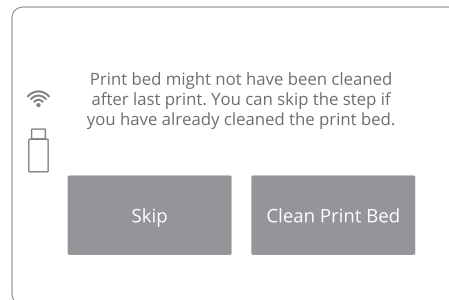


Image 45. Clean PRINT Bed screen 1.

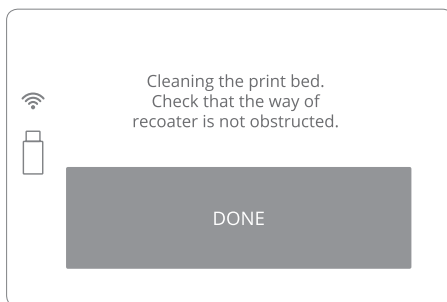


Image 46. Clean PRINT Bed screen 2.

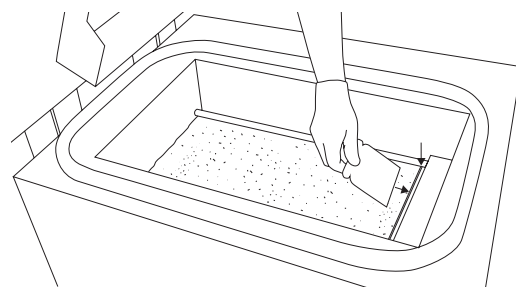


Image 47. Removing powder from PRINT Bed to OVERFLOW BIN.



14. Remove the powder from the OVERFLOW BIN the last time. (Remember about OVERFLOW BIN's locking bolt).
15. Transfer it to the container in which you will mix the unsintered powder from the printer, with the Fresh Powder (to refresh the used powder and prepare it for the next print).
16. Place the OVERFLOW BIN back in its place and press "DONE" (Image 48).
17. Check if all elements are at their default positions (RECOATER, Laser system). Check the tension and condition of the RECOATER cables and close the Lid.

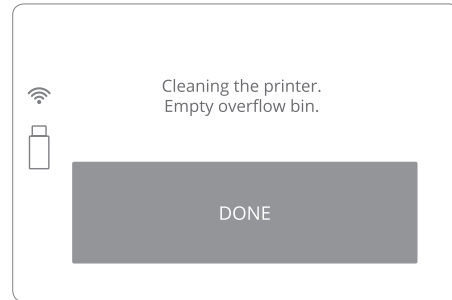


Image 48. Clean OVERFLOW BIN screen.

LISA PRINTER IS CLEAN AND READY FOR THE NEXT PRINT. ENJOY!!!



CAUTION!
Beware of sharp edges.



IMPORTANT!
If you will touch Short Infrared heater by your hand, remove it, clean and install one more time, using gloves or a clean cloth.

7. Technical support

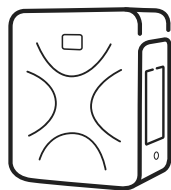
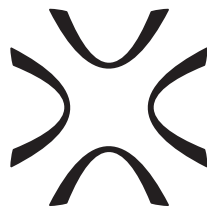
The latest information, technical support and versions of the manual are available by contacting us through:

- email: <https://www.sinterit.com/support-page>
- phone: +48 570 702 886

The list of distributors and technical support in specific countries can be found at www.sinterit.com/contact



IMPORTANT!
More information, f.ex. about working with powders etc. you will find in the full version of Sinterit LISA User Manual. We strongly recommend reading this full version before taking the action.



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