



# SINTERIT STUDIO

## USER MANUAL

SOFTWARE VERSION 5

USER MANUAL VERSION 1.1



## TABLE OF CONTENTS

1.	Overview of tabs in Sinterit Studio .....	4
	Introduction .....	4
A.	Preset tab .....	5
B.	Models tab .....	7
	Features in the Models tab .....	8
	Features and properties of a model .....	11
	Model context menu .....	11
C.	Slice tab .....	13
D.	Preview tab .....	14
E.	Printers tab .....	15
2.	Preparing files for printing in Sinterit Studio .....	17
A.	Preparing a new .sspf project .....	17
B.	Working on a saved .sspf file .....	19
3.	Creating the grid, i.e. duplication of prints - Create Grid .....	20
4.	Updating the Sinterit Lisa printer using Sinterit Studio .....	22

# 1. OVERVIEW OF TABS IN SINTERIT STUDIO

## INTRODUCTION

The program consists of five basic tabs.

- PRESET (setting printing parameters, e.g. powder type, layer height);
- MODELS (arranging models in the PRINT BED visualization);
- SLICE (slicing models into layers and saving the file for printing);
- PREVIEW (enables previewing layers before printing);
- PRINTERS (previewing the state of printers connected by Wi-Fi).

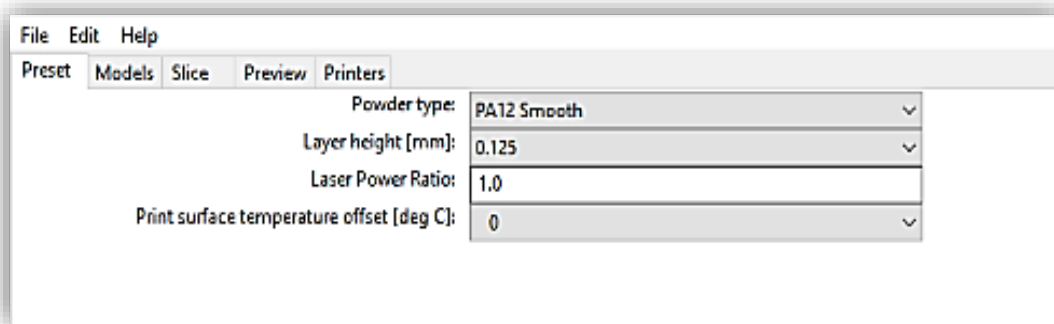


Fig. 1. View of the main panel.

At the top of the panel, you will find tabs for working on a project: FILE, EDIT, HELP.

- **FILE** – allows to open a new file (NEW), open an already saved file (OPEN) or save (SAVE AS) a project in the .sspf format.
- **EDIT** – allows to undo changes (UNDO) or restore the state before undo (REDO).
- **HELP** – help tab in which you can:
  - ✓ update your Sinterit Lisa printer (UPDATE PRINTER);
  - ✓ check for and download the latest updates for Sinterit Studio (CHECK FOR UPDATES);
  - ✓ check the license (ABOUT).

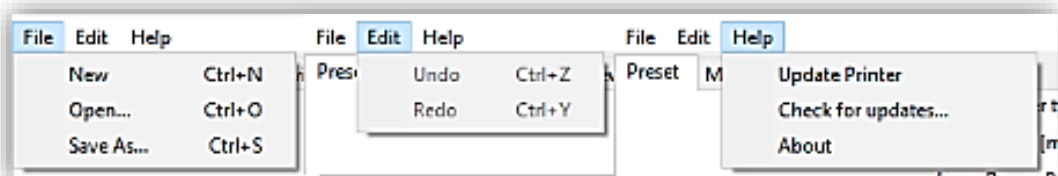


Fig. 2. View of top tabs with all the available features.

## A. PRESET TAB

- **POWDER TYPE:** allows to select the type of printing powder. When you select the appropriate type of powder, dedicated printing parameters appear in the remaining tabs.

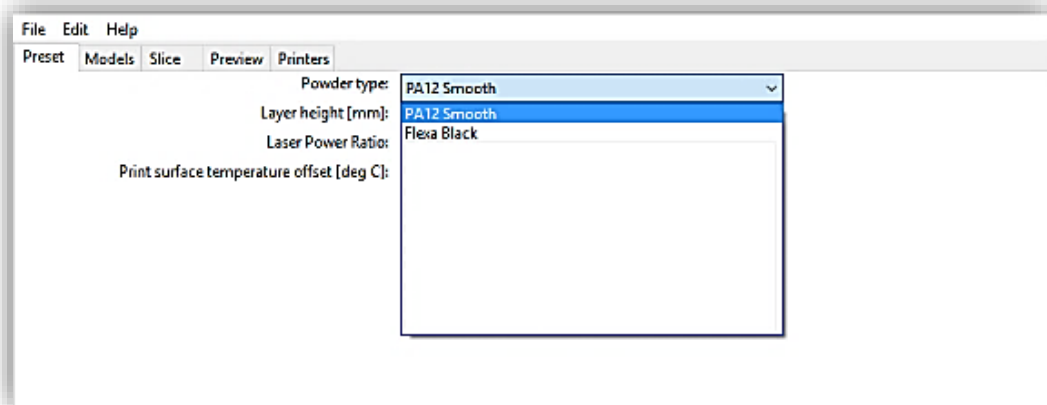


Fig. 3. Changing the type of powder.

- **LAYER HEIGHT:** parameter for selecting the height of the layer. It is selected according to powder type. The layer can be made thinner/thicker, however this involves changing the time and accuracy of the print.

**Example:** Increasing the layer height from 0.100 to 0.125 mm reduces printing time but, at the same time, decreases the accuracy of the printed object.

**THICKER LAYER = PRINTING SPEED  $\neq$  PRINT ACCURACY**

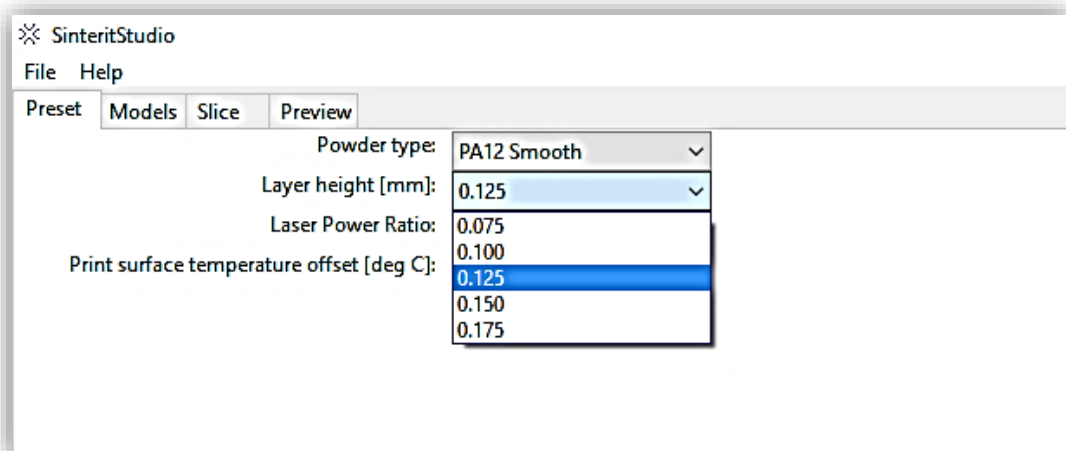


Fig. 4. Changing the layer height parameter.

- **LASER POWER RATIO:** parameter for changing laser power. Laser power can be increased or reduced to achieve different print durability.

**Example:** 1.0 is the standard power for a specific powder type (100%). Increasing the power (e.g. to 1.3) enables to achieve greater durability of the printed object but also reduces precision (“spilling” of melted powder, lack of detail) and printing speed.

**HIGHER LASER POWER = DURABLE PRINT ≠ PRINT ACCURACY**

**HIGHER LASER POWER = DURABLE PRINT ≠ PRINT SPEED**

- **PRINT SURFACE TEMPERATURE OFFSET:** changing this parameter is recommended only after careful examination of the powder’s properties. It enables to re-calibrate parameters (lower / increase the temperature inside). We recommend experimenting only with very small values +/- 0.5C or +/- 1.0C, not higher.

**Example:** If the print is overheated and difficult to remove, the temperature must be lowered. If the print has insufficient adhesion or its edges are curled, the temperature must be increased.



### CAUTION!

Even though each machine is calibrated, it is recommended to load a short printing test to check the setting of parameters in Sinterit Studio and Sinterit Lisa, especially when the machine is launched for the first time (calibration).

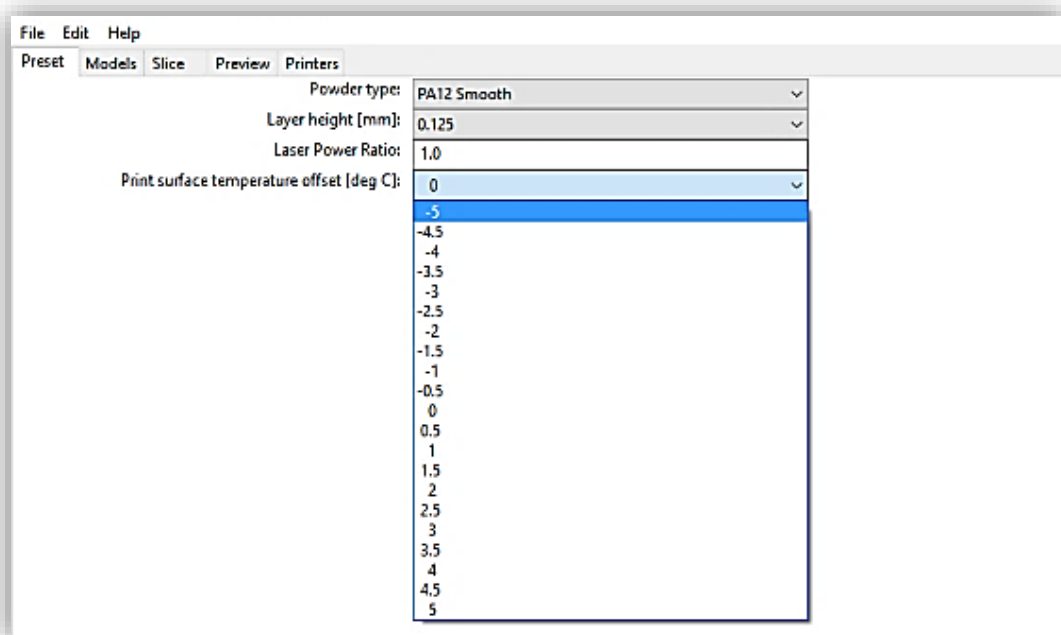


Fig. 2. Changing the temperature parameter.

## B. MODELS TAB

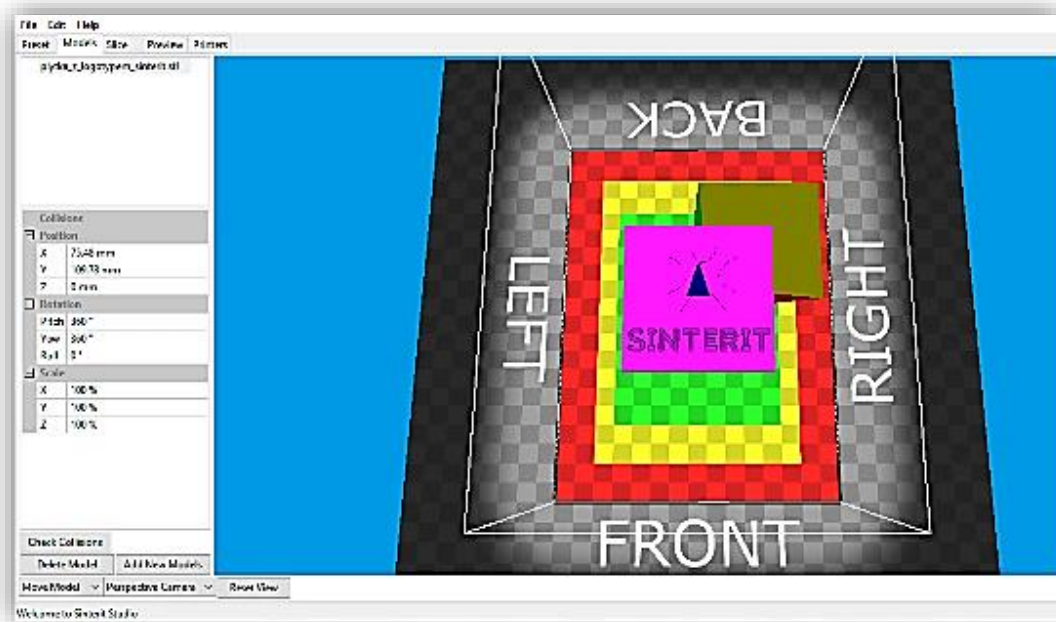


Fig. 6. View of the MODELS tab.

This tab contains a visualization of the PRINT BED. The view is divided into areas, where 1 square is 1 cm<sup>2</sup>.

### For PA12 Smooth there are 3 areas:

- Green: proper printing area. Models of highest and most durable quality.
- Yellow: acceptable printing area. Single, small elements may stick out there, however they may damage/warp the print.
- Red: protection area of prints. Arranging prints is not recommended (prints may become deformed and destroy the entire print).

### For Flexa Black there are 2 areas:

- Green: proper printing area. Models of highest and most durable quality.
- Red: protection area of prints. Arranging prints is not recommended (prints may become deformed and destroy the entire print).

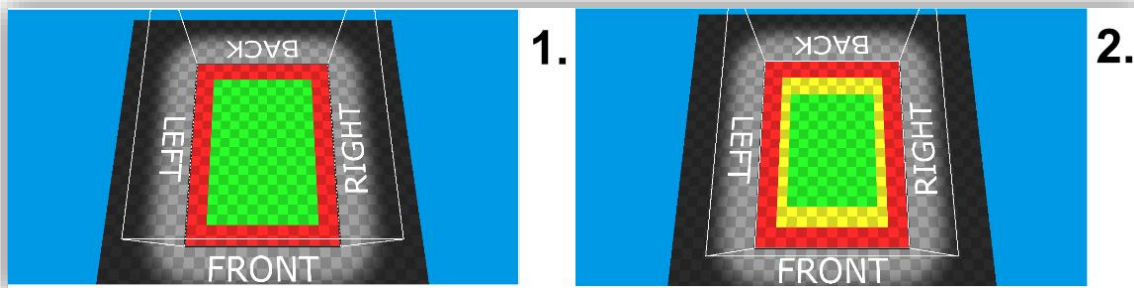


Fig. 7. View of the work area for Flexa Black (1) and PA 12 Smooth (2).

## FEATURES IN THE MODELS TAB

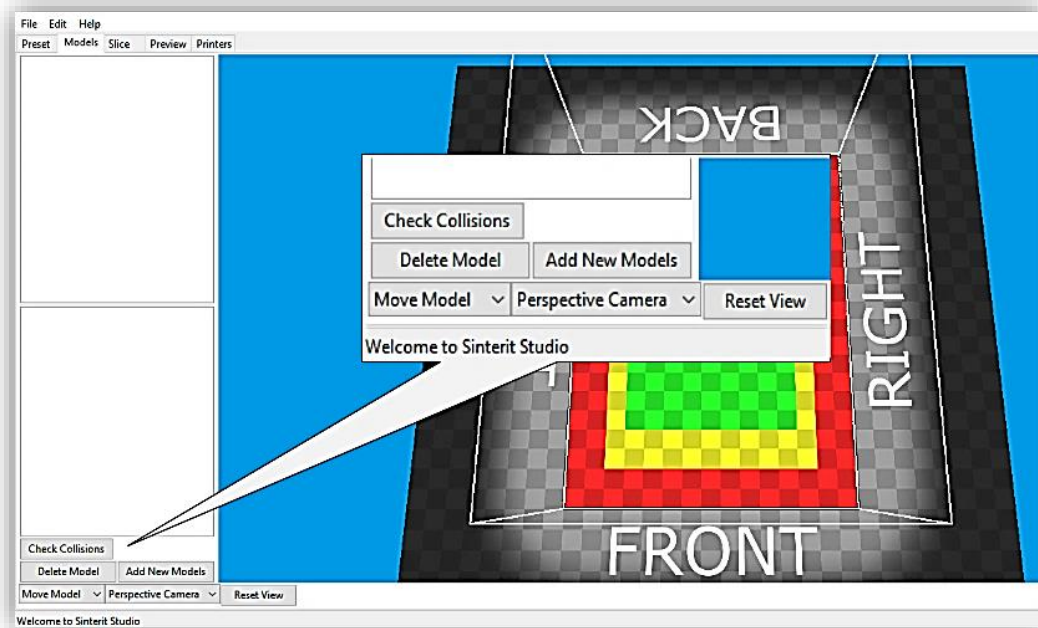


Fig. 8. Enlarged view of features in the MODELS tab.

- **ADD NEW MODEL:** allows to add another model, e.g. STL, for printing.
- **DELETE MODEL:** allows to remove a single model (the feature is also available after hitting DELETE on the keyboard).
- **MOVE MODEL / ROTATE MODEL:** panel for working on the print model.
  - **ROTATE MODEL** – rotating the model in three axes. By default, the left mouse button after moving the mouse pointer over the displayed manipulator.

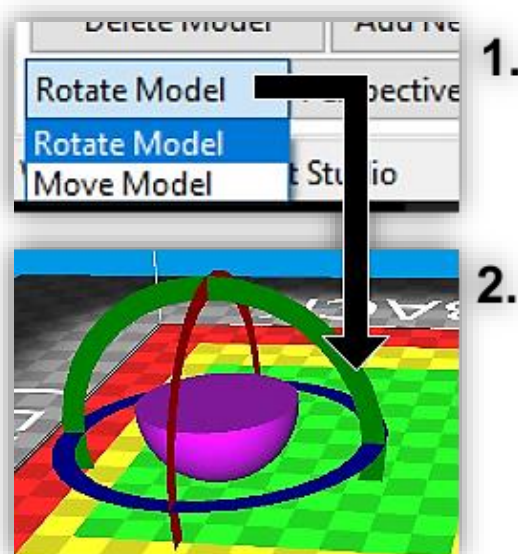


Fig. 9. Rotate Model (1) feature and view of rotation axes in the model (2).



- **MOVE MODEL** – moving the model in three dimensions. By default, the right mouse button after moving the mouse pointer over the displayed axis.

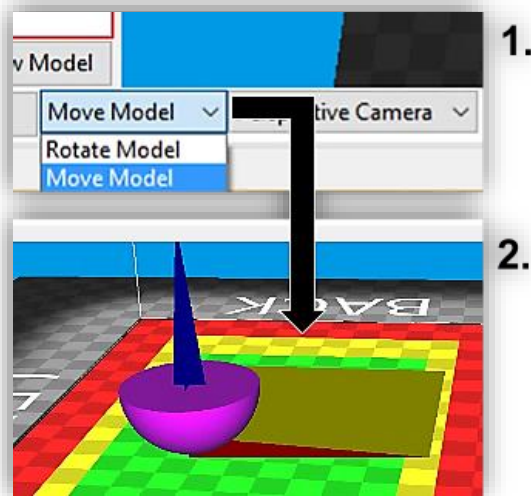


Fig. 10. Move Model (1) feature and view of planes in the model (2).

- **PERSPECTIVE CAMERA / ORTHO CAMERA:** camera view panel.
  - **PERSPECTIVE CAMERA** - three-dimensional camera view which allows accurate placement of the object in the work area. By default, the camera is rotated using the right mouse button.
  - **ORTHO CAMERA** - orthogonal projection of the model on the plane (two-dimensional view in the work area). Particularly recommended with Z axis (top view). By default, the right mouse button.

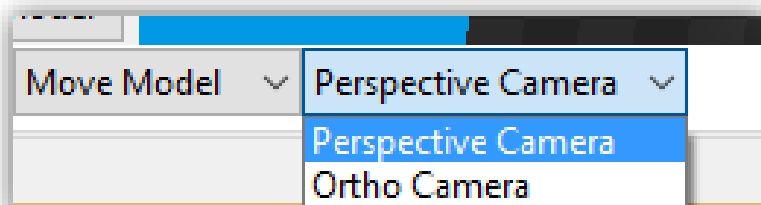


Fig. 11. Camera view panel.

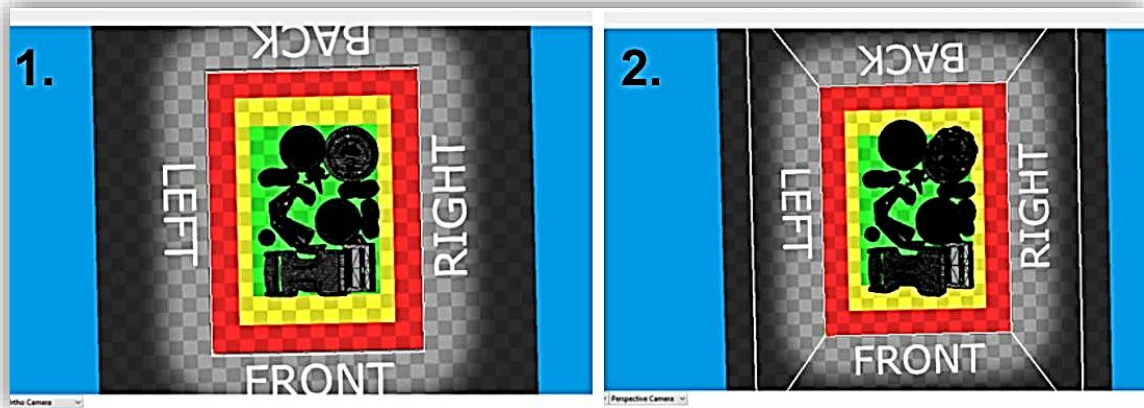


Fig. 12. Comparison of the Ortho Camera (1) and Perspective Camera (2) views in the Z axis. Visible changes in positioning of prints due to perspective.

- **RESET VIEW:** this button allows to restore the standard camera view. It is particularly recommended in the Ortho Camera view.
- **CHECK COLLISIONS:** this button checks the arrangement of the model on the BED. It checks if the model:
  - is positioned on the green field (yellow warning sign);
  - is positioned on the PRINT BED (red warning sign);
  - does not interfere with another model (red warning sign).

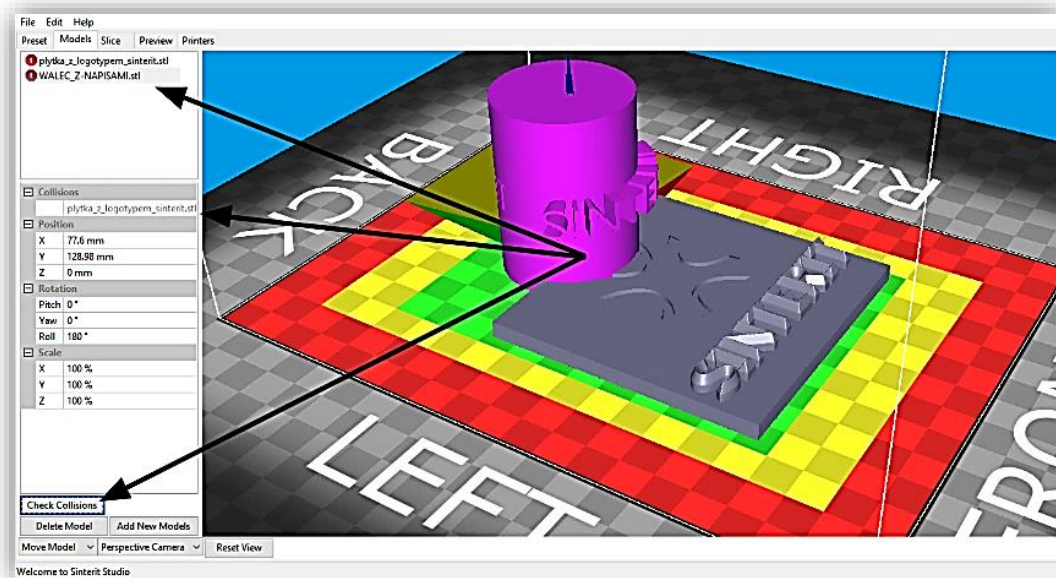


Fig. 13. Check Collisions button with an example of its use. It allows to detect errors which are invisible to the human eye.

## FEATURES AND PROPERTIES OF A MODEL

After the model is loaded, detailed information concerning its properties are displayed in the left part of the window:

- position in the PRINT BED (Position),
- angular arrangement of the model in the work area (rotation),
- scale (Scale).

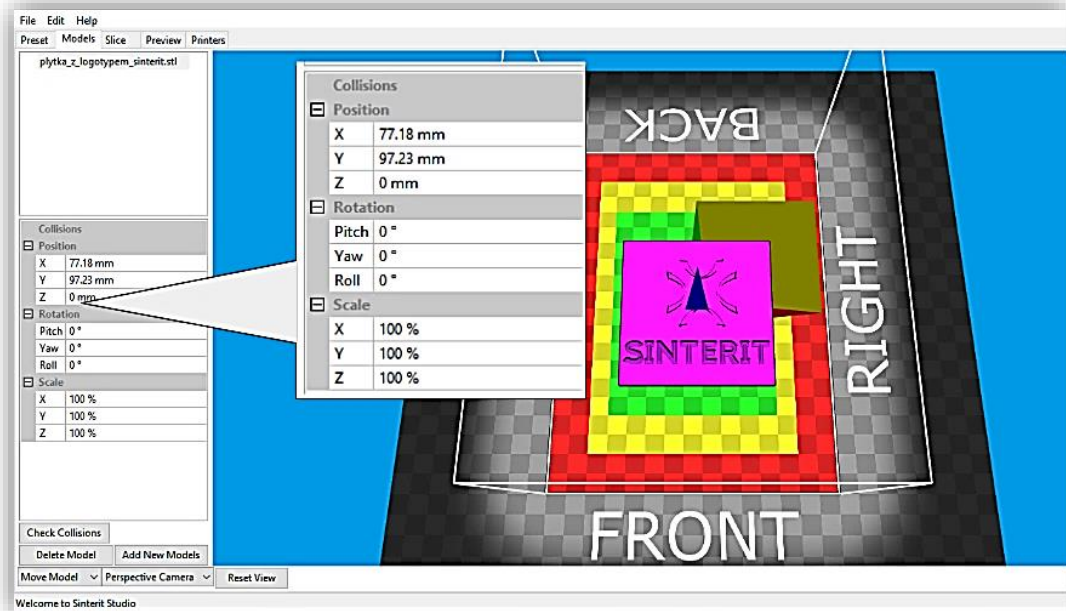


Fig. 14. Enlarged view of the properties of a loaded model.

**Position** – this parameter changes the position of the model in the PRINT BED. Values can be entered manually next to each plane (X, Y, Z) or by means of the mouse after moving the mouse pointer over the selected manipulator (after switching to MOVE MODEL).

**Rotation** – this parameter changes the rotation axis. Values can be entered manually next to each axis (Pitch, Yaw, Roll) or after moving the mouse pointer over the selected plane (after switching to Rotate Model). This feature is particularly useful for angular arrangement of models: 90°, 45°, 135°, etc.

**Scale** – this parameter changes the size of the model and is expressed as a percentage. Sizes can be changed next to each axis (X, Y, Z).

Each of these information can be edited to achieve the best fit of the printed model.

## MODEL CONTEXT MENU

Right-clicking a model (or name of a model) shows a context menu in which you can:

- copy a model (Duplicate Model),
- create a grid of models, i.e. duplicate n-times in each grid (Create Grid);
- delete a model (Delete Model);

- add a model (Add Model);
- change the PRINT BED view to models located inside (View).

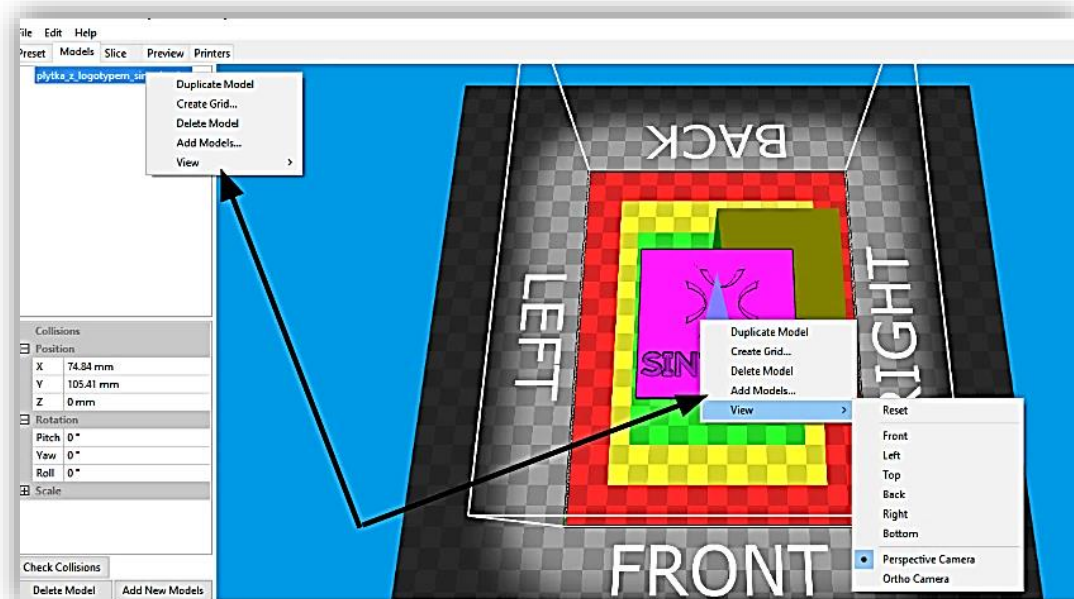


Fig. 15. Right-click context menu of the model.

The View option offers 7 view types of models in the PRINT BED:

- front (1),
- left (2),
- top (3),
- back (4),
- right (5),
- bottom (6),
- reset.

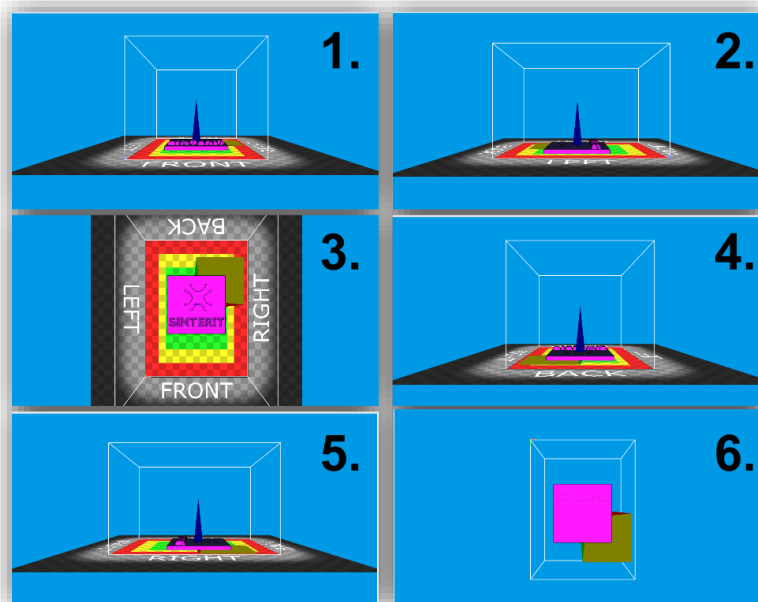


Fig. 16. Different views of the PRINT BED.

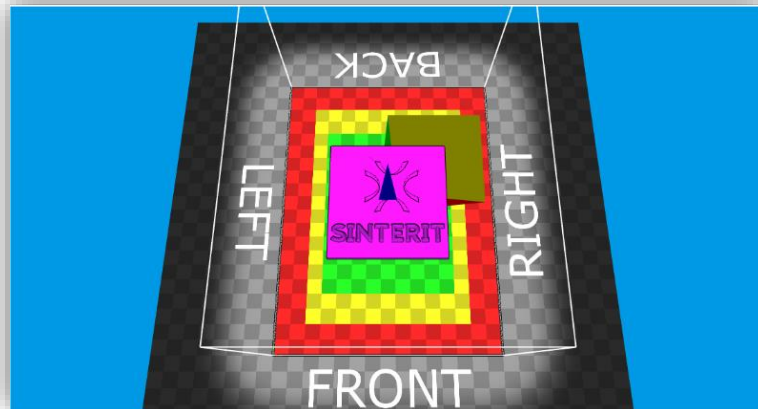


Fig. 17. The view after applying the Reset feature.

## C. SLICE TAB

This tab prepares the model for final printing. Using the SLICE button allows to save the file (with the SCODE extension); afterwards, the model is “sliced” into layers. Depending on the size of the file, this may take several minutes.

When the process is complete, information required for preparing the Sinterit Lisa printer for printing appear in the dialog box. You should read them carefully (printing them is recommended).

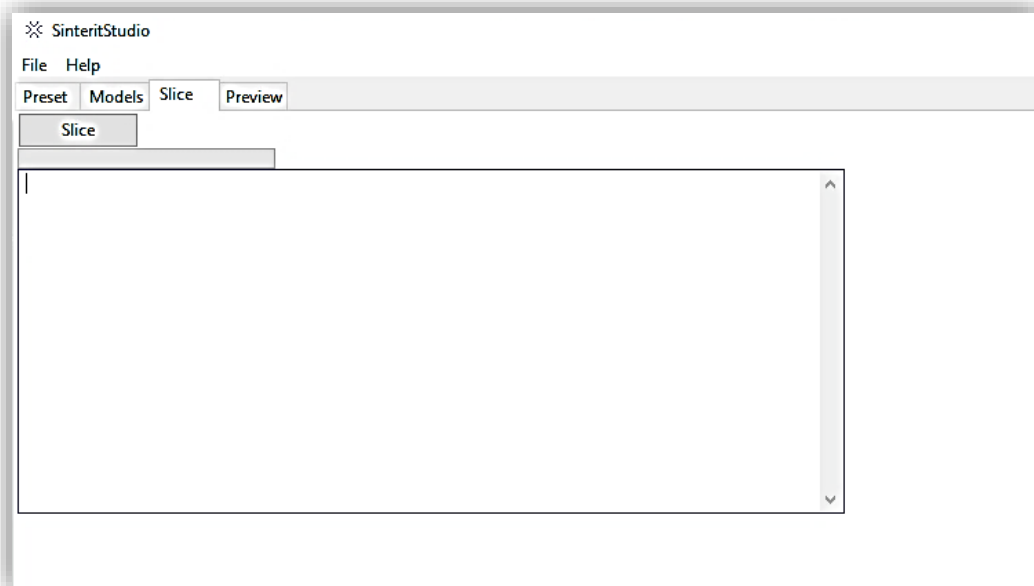


Fig. 18. The SLICE tab before “slicing”.

## **IMPORTANT!**

**INFORMATION DISPLAYED AFTER THE “SLICING” PROCESS OF THE MODEL NECESSARY FOR FURTHER WORK WITH THE SINTERIT LISA PRINTER.**

- file name,
- used powder type,
- layer height,
- laser power,
- temperature change (if there is any),
- number of layers in the model,
- model capacity in  $\text{cm}^3$ ,
- estimated amount of powder needed in the Feed BED (height in cm),
- estimated amount of powder needed in the FEED BED (volume in L),
- total height of the print (height in cm),
- amount of FRESH POWDER which needs to be added after printing to PRINT READY POWDER (volume in L),
- estimated total time of printing,
- estimated warm-up time,
- estimated printing time,
- estimated cooling time.

## **D. PREVIEW TAB**

This tab allows to preview individual layers of the model after the “slicing” stage. This enables careful inspection of the sliced model and detection of potential mistakes which are not visible at the stage of preparing the file.

In this tab you can check individual layers of the “sliced” model in 2D or 3D view. You can enter a specific layer number manually using the input field or use the **Next Layer/Previous Layer** feature.

You can also check a different .scode file using the **Load from file** feature.



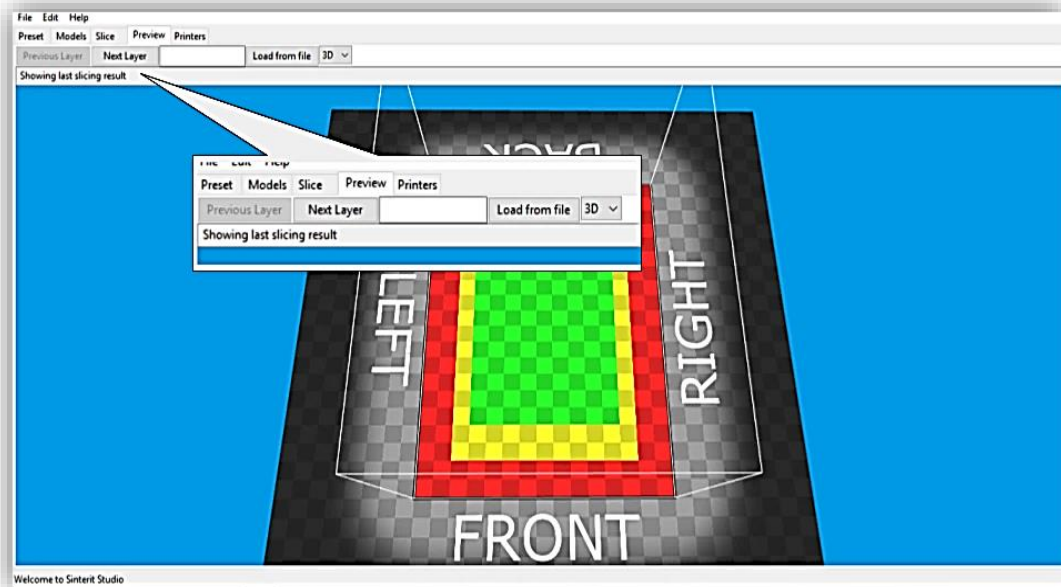


Fig. 19. Preview tab and enlarged view of the available features.

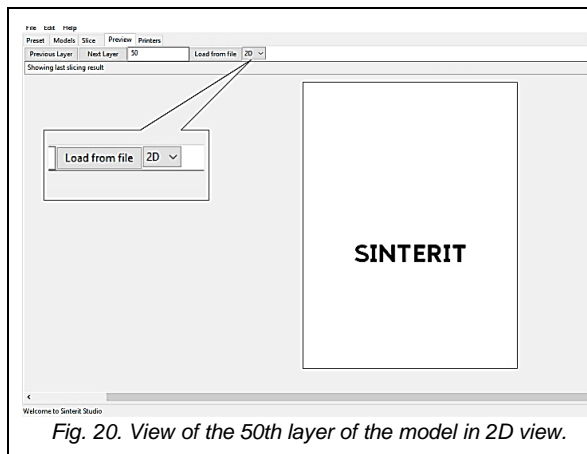


Fig. 20. View of the 50th layer of the model in 2D view.

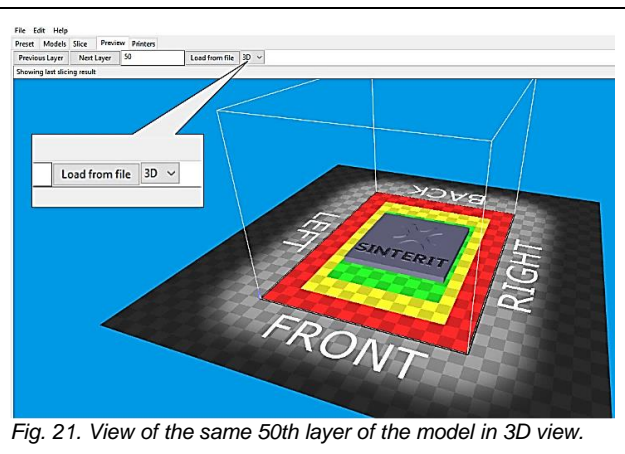


Fig. 21. View of the same 50th layer of the model in 3D view.

## E. PRINTERS TAB

The Printers tab is used for checking the printing status and temperature inside Sinterit Lisa printers connected via Wi-Fi (the instruction how to connect a printer to Wi-Fi can be found in the Sinterit Lisa manual). It is particularly helpful when the printer is located in a different room/building.

This tab optimizes work in a simple way and allows to load another file into the printer.

File	Edit	Help
Preset	Models	Slice
Preview	Printers	
Printers connected to your WiFi network:		
061020160005	(10.234.207.147) - Surface temperature: 49.1°C	2348_ct1_new.scode (PRINTING FINISHED)
061020160003	(10.234.207.101) - Surface temperature: 31.1°C	test_feed_print.scode
070920160001	(10.234.207.130) - Surface temperature: 31.2°C	8zebatek_zrywka.scode
031120160003	(10.234.207.102) - Surface temperature: 32.0°C	
091120160003	(10.234.207.113) - Surface temperature: 29.7°C	test_feed_print_obrocone.scode
061020160009	(10.234.207.118) - Surface temperature: 31.1°C	
061020160007	(10.234.207.112) - Surface temperature: 30.5°C	8zebatek_zrywka.scode
101120160005	(10.234.207.117) - Surface temperature: 30.8°C	
031120160002	(10.234.207.116) - Surface temperature: 30.1°C	

Fig. 22. Printers tab and printing status of printers connected via Wi-Fi.



## 2. PREPARING FILES FOR PRINTING IN SINTERIT STUDIO

### A. PREPARING A NEW .SSPF PROJECT

1. To create a new project, select **FILE // NEW**.
2. Go to the **MODELS // ADD NEW MODEL** // tab and select **STL / OBJ / FBX** files.

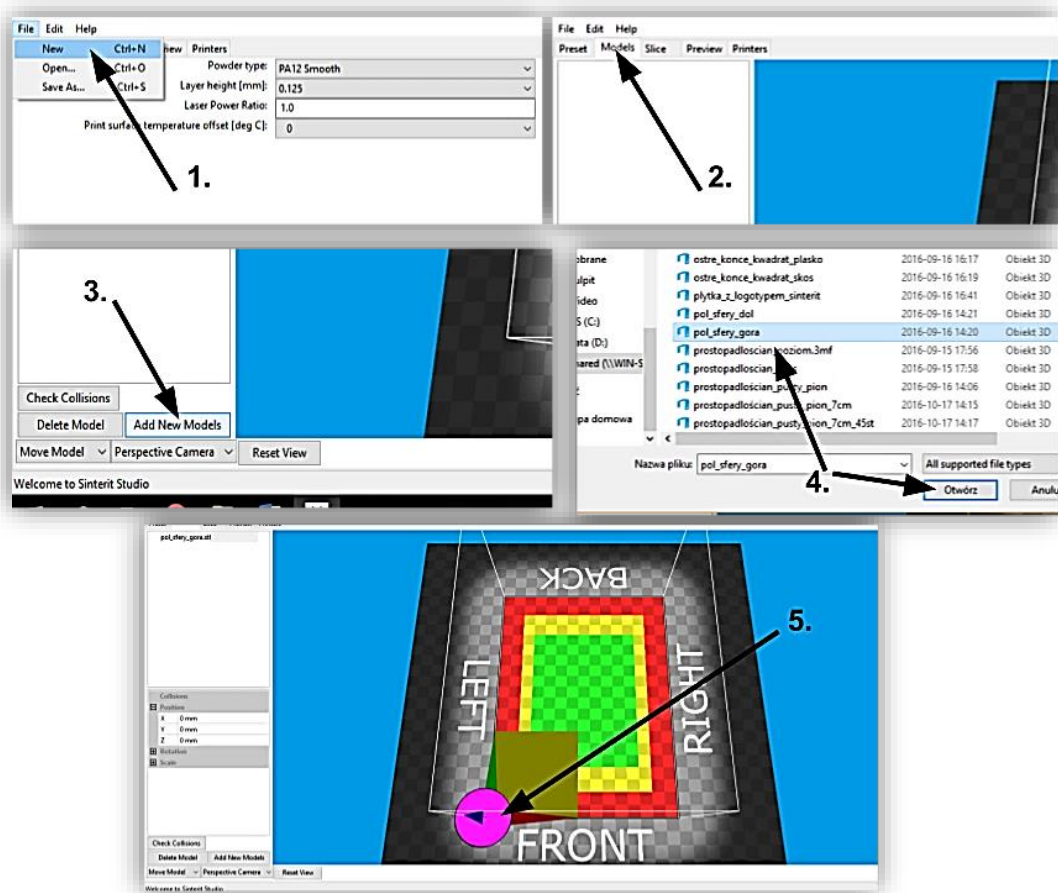


Fig. 23. The steps in creating a new project.

3. Select the type of powder in the **PRESET** tab. You can change the printing settings or leave the default settings for the appropriate type of powder (recommended).
4. In the **MODELS** tab, prepare selected models for printing, according to instruction for arranging prints (especially in case of PA12).

You can:

- add or remove models (**ADD NEW MODEL / DELETE MODEL**);
- move and arrange models in three dimensions (**MOVE MODEL** or **POSITION**);
- rotate models in three axes (**ROTATE MODEL** or **ROTATION**);
- change the size of the model in each dimension (**SCALE**);

- check if models overlap each other or extend beyond the green area (**CHECK COLLISIONS**);
- copy a model (**DUPLICATE MODEL**);
- duplicate the model n-times in the BED (**CREATE GRID**).

All the features described above are available on the left side of the Models tab or after moving the mouse cursor over the model/model name and clicking the right mouse button. A detailed explanation of each feature is provided in Chapter 1, in the Models tab.

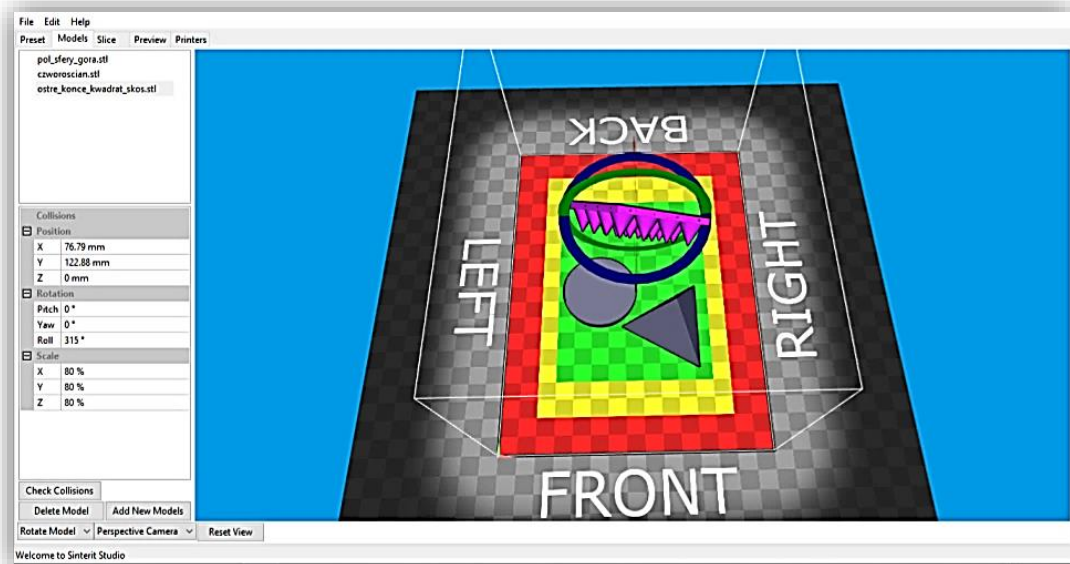


Fig. 24. Preparing models for “slicing” in the Models tab.

5. Make sure all models are arranged properly on the PRINT BED for printing and go to the SLICE tab.
6. To save a project (to work on it later or “slice” it), click: **FILE // SAVE AS... // project name .SSPF**
7. Click on the SLICE button to save the file with the .SCODE extension (it is recommended to first save the file on your local disk and then copy it to a USB flash drive), and wait for the program to prepare the file. This may take several minutes.

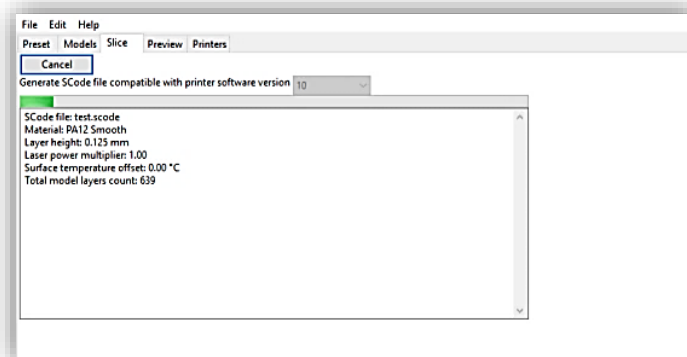


Fig. 25. Model “slicing” in progress.

8. When the process complete, the “**SLICING FINISHED**” message will appear.
9. Click “OK” to finish. The model is “sliced” into layers.

10. All information related to project, such as printing duration, required amount of PRINT READY POWDER before printing and amount of FRESH POWDER which needs to be added after printing, appear in the dialog box (we recommend that you print this information, especially when the Sinterit Lisa printer is located in a different room/building/city).

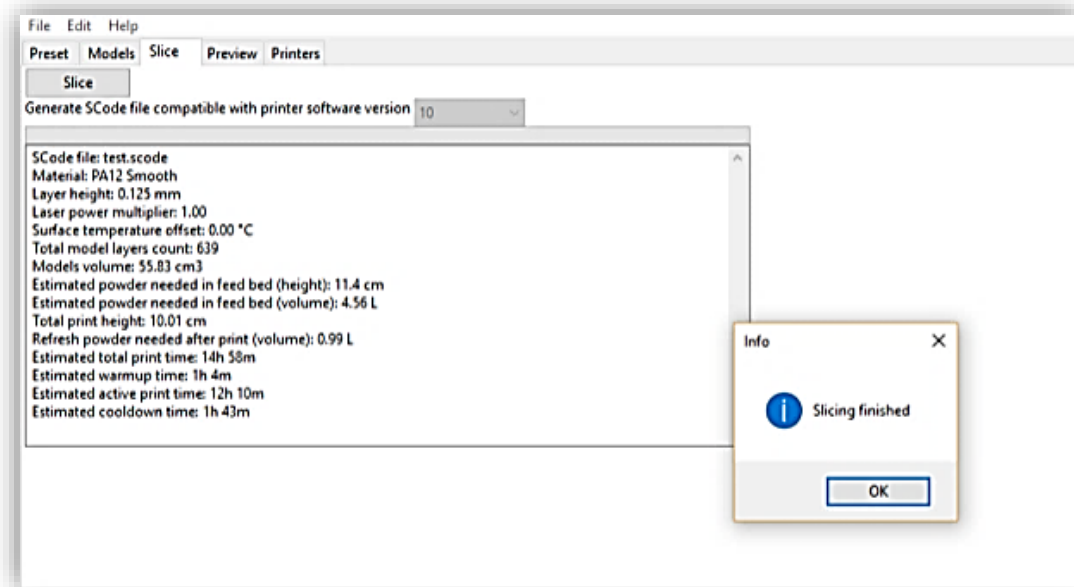


Fig. 26. Completed “slicing” process of the model along with other relevant information for further work with Sinterit Lisa printer.

11. In the PREVIEW tab you can preview the print layer by layer and check for possible errors.
12. If everything is correct, copy the file onto a USB flash drive, transfer it to the SINTERIT LISA printer, and follow the instructions on the printer’s screen.

## B. WORKING ON A SAVED .SSPF FILE

1. To open an existing project, select: **FILE // OPEN // .SSPF file type**.
2. Once loaded, a project can be modified and/or “sliced” like a new project.



### REMEMBER!

If you need to copy or send an existing project with .SSPF extension to another data medium/computer, you will also need model source files for this project (STL, OBJ or other files supported by Sinterit Studio).

Otherwise it will not be possible to load the project correctly on a different computer.

This rule does not apply to files with the SCODE extension.

### 3. CREATING THE GRID, I.E. DUPLICATION OF PRINTS - CREATE GRIDS

If you need to print a lot of models at one time, a very useful feature is CREATE GRID. It allows to duplicate the selected model at the specified amount of times.

1. Load the desired model in the PRINT BED visualization.
2. Arrange the model according to the instruction (especially in case of PA12) and position it as closely as possible to the left corner of the green field.
3. Make sure it does not extend beyond the green area (CHECK COLLISIONS).
4. Using the right mouse button, click on the model to activate the context menu and select the CREATE GRID feature.

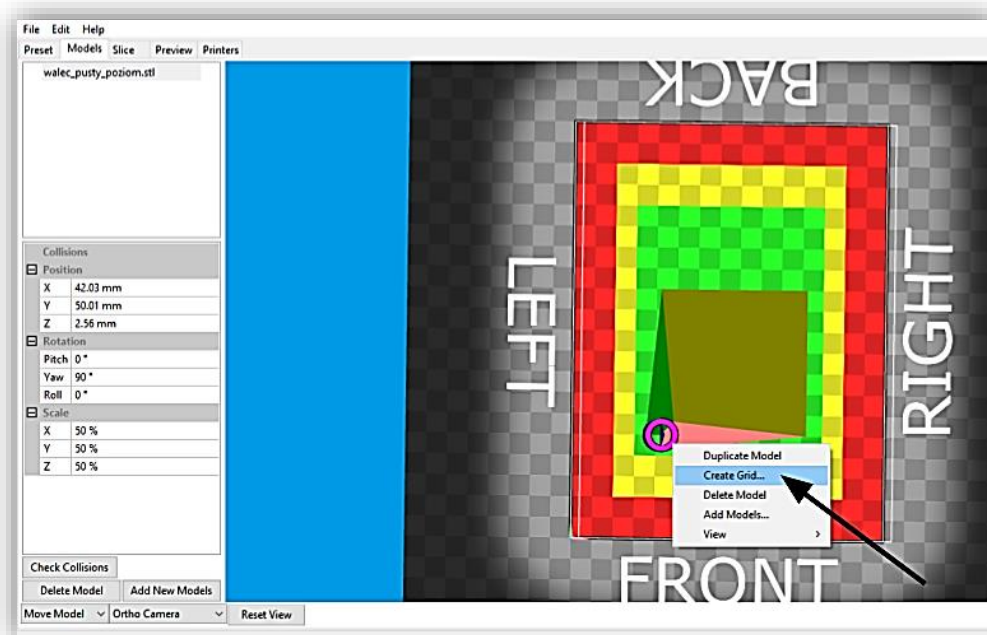


Fig. Activating the CREATE GRID feature.

5. When you click on the feature, a table appears in which you can enter the number of prints (**COUNT**) in each axis and the gap between them (**GAP**).

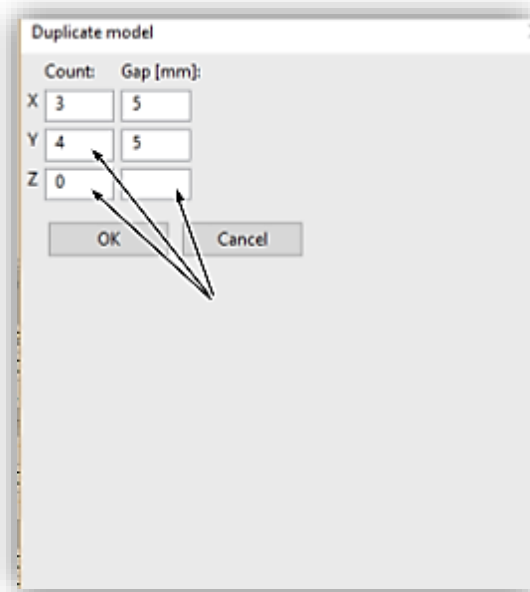


Fig. 28. CREATE GRID table.

## ! REMEMBER!

In case of large or tightly filled objects, the gap between models should be at least 5 mm.

6. When all parameters are entered, a grid of duplicated models is created. Each of them can be individually adjusted or removed to optimize the filling of the PRINT BED.
7. If the quantity entered was too low, you can use the **CREATE GRID** or **DUPLICATE MODEL** (to copy a single model) feature once again.

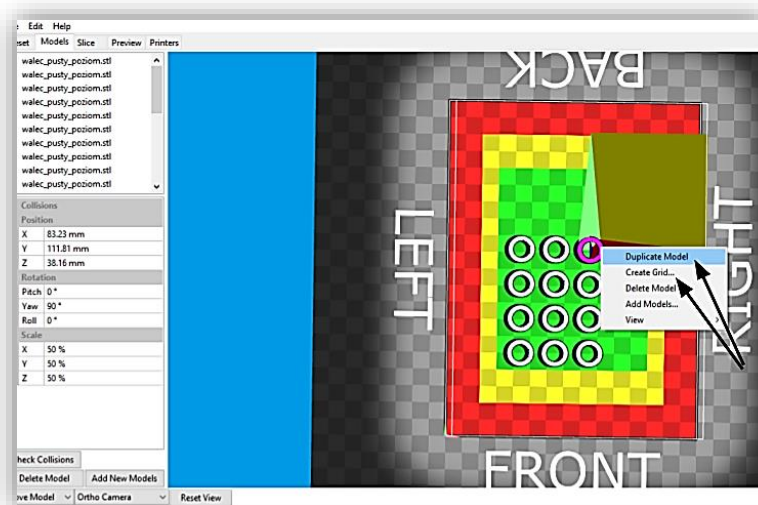


Fig. 29. Duplicated models and views of DUPLICATE MODEL and CREATE GRID.

## 4. UPDATING THE SINTERIT LISA PRINTER USING SINTERIT STUDIO

It is possible to update Sinterit Lisa software so that it works with the latest available Sinterit Studio software. First we recommend that you check whether a new version is available (**HELP // CHECK FOR UPDATES**).

To update the printer:

1. Go to the **HELP // UPDATE PRINTER** tab.
2. Insert the USB flash drive into the USB port on your computer and then click **CREATE UPDATE USB DRIVE**. The process may take several minutes.
3. After the files are copied, a message appears to safely remove the USB flash drive, insert it into the USB port on the printer, and follow the instructions on the screen.

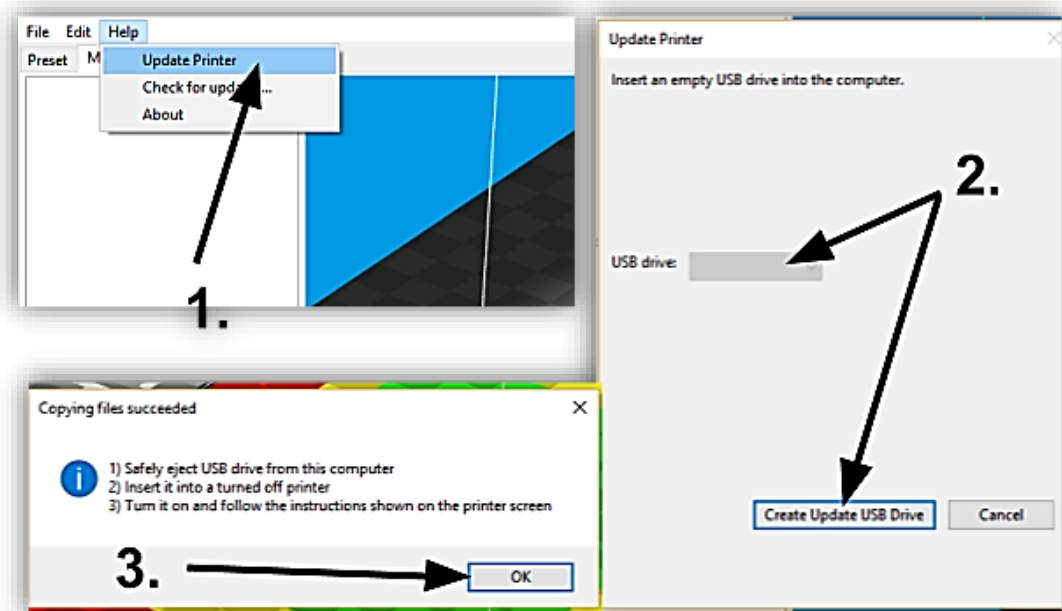


Fig. 30. Downloading updates for Sinterit Lisa.