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Stratasys J5 GrabCAD Print User Manual

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Overview

Voxel printing enables the fabrication of many different parts with complex material distribution, such as a gradient or a sophisticated pattern. In a program, such as Matlab, you slice the model and generate a stack of BMPs or PNGs. Each slice contains the voxel information.
After processing these files in the Stratasys Voxel Print Utility, you import the generated GrabCAD voxel file (*.gcvf* file) into GrabCAD Print for printing.
This guide provides instructions for voxel printing with GrabCAD Print on Stratasys J7, J8 and J5 series 3D printers.

Important:

Verify that the computer workstation you use to send the information to the printer has the minimum requirements, as described in the relevant Site Preparation Guide.

Revision History

Translations of this guide are updated periodically. If you are consuming a translated version, please check the English version for the latest revision and list of updates.

Revision	Release date	Description
G	June 2021	• Replaced J55 with J5 series throughout the guide. • Removed the confidentiality statement from the guide.

Slice Preparation Guidelines

When preparing the slices (BMPs or PNGs files), consider the following guidelines:

- The number of slices for each material must be
- Make sure that you prepared one BMP/PNG for each If a certain material is not used in a specific slice, create an empty BMP/PNG file (blank) for it.
- It is recommended that the layer thickness of the slices you prepare match the printer layer Printer layer thickness is, as follows:
  - J5 series—0.01875 mm
  - J7 and J8 series—
    - 014 mm (in High Quality mode)
    - 027 mm (in High Speed & High Mix modes)

When printing the slices, if the slice thickness does not match the printer layer thickness, the printer compensates for the difference. This may include repeating or skipping of slices. For example, if you set the slice thickness to 0.0135 mm, and your printing mode is High Mix, the printer prints each image twice to reach the desired thickness of 0.027 mm.

- When assigning colors to your model, it is recommended that you use the RGB values of the PolyJet base Below is the list of RGB values of PolyJet base materials.\

Color	Red	Blue	Green
Cyan	0	89	158
Magenta	161	35	99
Yellow	213	178	0
Black	30	30	30
White	220	222	216

Generating a GrabCAD Voxel File from PNGs

After preparing the PNG file, you need to process it in the Voxel Print Utility in GrabCAD Print. This utility generates a GrabCAD voxel file (*.gcvf file) that you import into GrabCAD Print for printing.

To generate GrabCAD voxel files from PNG files:

1. Open GrabCAD
2. From the *Apps* menu, select **Launch Voxel Print Utility**.
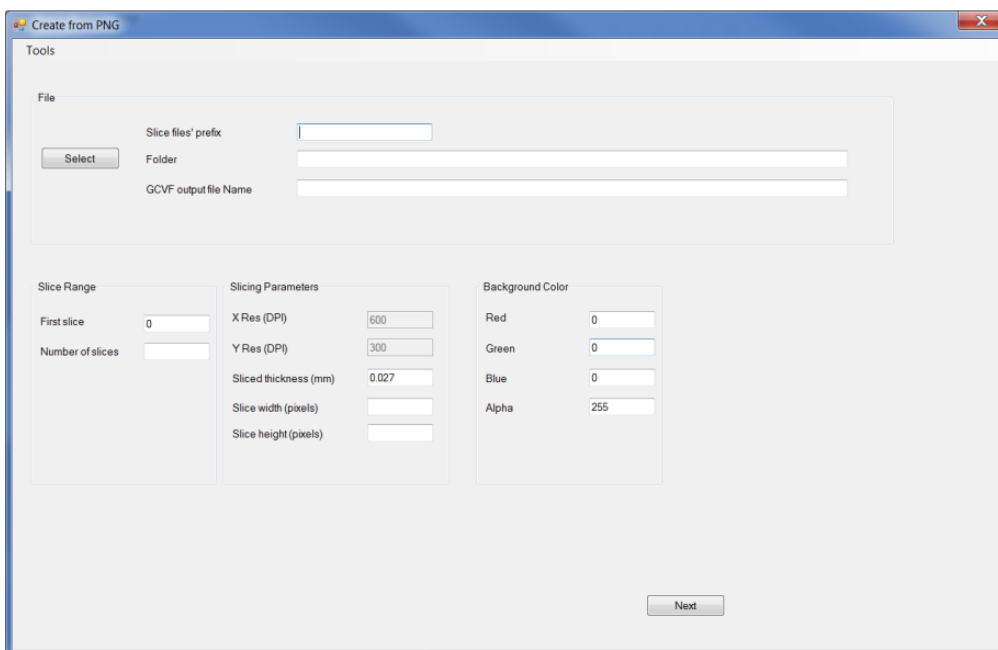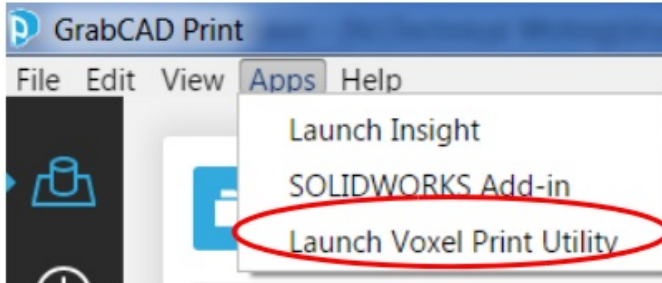
Important: Slicing Parameters for J5-Series Printers

- Slice resolution = 300 x 300 DPI
- Slice thickness = 01875 mm

From the *Tools* menu, select **Insert PNG**.
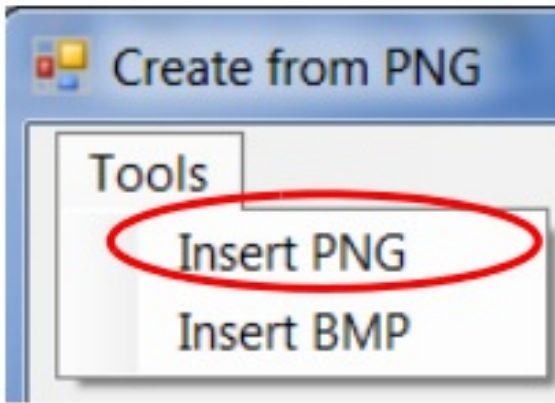
In the *Slice file prefix* field, enter a prefix for the image files, such as 'slice_'. This prefix is assigned to all image files.

Click **Select** and navigate to the folder that contains the PNG

Select the folder where the files PNG are

The location of the files, the path to the GCVF file, and all relevant slice information appear in the screen.

Click Next.

A progress bar shows the progress of the *.gcvf* file generation

When the *.gcvf* file generation is complete, the *Material Mapping* screen appears. The colors on the right side are the base colors that the Voxel Print Utility identified in the PNG files. To ensure color accuracy when printing the model on the PolyJet 3D printer, you need to match each of the colors on the right with a suitable PolyJet Model material (left side). For example, the blue color on the right side could be mapped to VeroBlue or VeroCyan
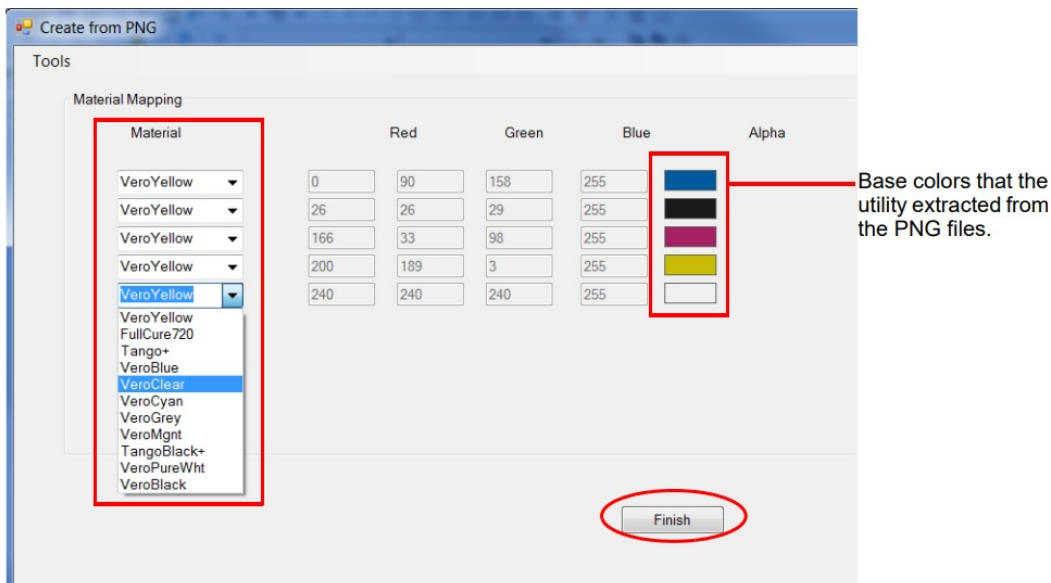
In the *Materials* column, select each PolyJet Model material you want to use based on the color shown on the right side of the screen
Before printing, make sure that the Model materials that you assigned are loaded in the material cabinet.

Click **Finish**.The following message
When the following message appears, click **OK**.
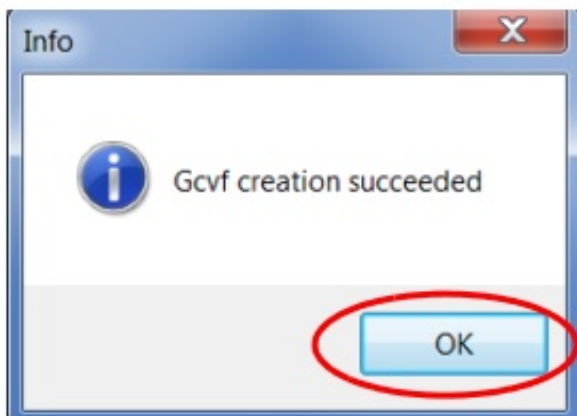
Close the Voxel Printing
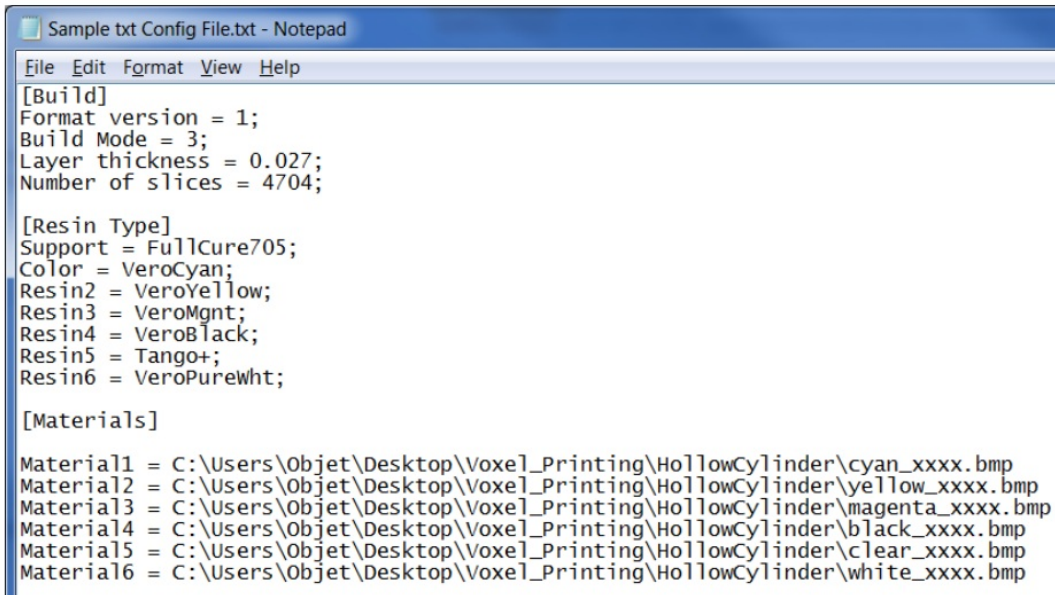
To print the voxel file, continue with

Creating a GrabCAD Voxel File from BMPs

To generate a GrabCAD voxel file from a BMP file, you first need to create a voxel configuration file.

Preparing a Voxel Configuration Text File for BMPs

When printing BMP slices, you need to create a voxel configuration text file. You do this in a text editor, such as Notepad. Below is a sample of a voxel configuration text file.

```
Sample txt Config File.txt - Notepad
File  Edit  Format  View  Help
[Build]
Format version = 1;
Build Mode = 3;
Layer thickness = 0.027;
Number of slices = 4704;

[Resin Type]
Support = FullCure705;
Color = VeroCyan;
Resin2 = VeroYellow;
Resin3 = VeroMgnt;
Resin4 = VeroBlack;
Resin5 = Tango+;
Resin6 = VeroPureWht;

[Materials]

Material1 = C:\Users\Objet\Desktop\Voxel_Printing\HollowCylinder\cyan_xxxx.bmp
Material2 = C:\Users\Objet\Desktop\Voxel_Printing\HollowCylinder\yellow_xxxx.bmp
Material3 = C:\Users\Objet\Desktop\Voxel_Printing\HollowCylinder\magenta_xxxx.bmp
Material4 = C:\Users\Objet\Desktop\Voxel_Printing\HollowCylinder\black_xxxx.bmp
Material5 = C:\Users\Objet\Desktop\Voxel_Printing\HollowCylinder\clear_xxxx.bmp
Material6 = C:\Users\Objet\Desktop\Voxel_Printing\HollowCylinder\white_xxxx.bmp
```

Important:

- The bitmap files need to be 1-bit (binary) BMP
    - BMP LUT 0 for voxels in which the current material is not
    - BMP LUT 1 for voxels in which the current material is
- The BMP files should be named by their The exact material name does not matter, since the exact material names are specified in the text file.
- BMP files are not required for the Support material GrabCAD Print calculates where Support material is needed.
- Save the BMP files and the voxel configuration text file on the host computer, not on the printer
- The number of resins and materials listed in the text file depends on your For example for J5 series, you will have 5 resins and materials listed.

Follow the instructions in this section to create the voxel configuration text file accurately.

To create a voxel configuration text file:

In the text file, list the parameters as follows:

Build section—

Parameters in File	Definition / Instruction
[Build]	This is a section header for the following parameters. Do not add a semi colon (**;**) at the end of the header.
Format version = 1;	Keep this value as '1'.
Build Mode = x;	Set the values to '3'.
Layer thickness = 0.0xx;	Set the layer thickness that you used to slice the model (see **"Slice Preparation Guidelines" on page 5**).
Number of slices = xxx;	Set the total number of slices for each material (see Note below). **Important:** GrabCAD Print crashes if this number is not correct.

Number of Slices:

To determine the total number of slices, open the folder where the slices are located, and check the number of the last slice. If the first slice is '0', you need to add 1 to the number of the last slice. For example, if the first slice is *slice_0.png* and the last slice is *slice_2124.png*, enter 2125 in the field, as shown below.

Resin Type section—for J5 seriesv

Parameters in File	Definition / Instruction
[Resin Type]	This is a section header for the list of material names in the printer. Do not add a semi colon (**;**) at the end of the header.
Support = FullCure705;	Set the Support material name.
Color = *<Model material1 name>***;**	Set the name of a material loaded.
Resin2 = *<Model material2 name>***;**	Set the name of a material loaded.
Resin3 = *<Model material3 name>***;**	Set the name of a material loaded.
Resin4 = *<Model material3 name>***;**	Set the name of a material loaded.
Resin5 = *<Model material3 name>***;**	Set the name of a material loaded.

Resin Type section—for J7 and J8 series

- In High Speed mode, where there are only 3 Model materials are used for printing:

Parameters in File	Definition / Instruction
[Resin Type]	This is a section header for the list of material names in the printer. Do not add a semi colon (**;**) at the end of the header.
Support = FullCure705;	Set the Support material name.
Color = *<Model material1 name>***;**	Set the name of a material loaded.
Resin2 = *<Model material2 name>***;**	Set the name of a material loaded.
Resin3 = *<Model material3 name>***;**	Set the name of a material loaded.

- In High Quality and High Mix modes, where there are 6 materials loaded:

Parameters in File	Definition / Instruction
[Resin Type]	This is a section header for the following list of material names in the printer. Do not add a semi colon (**;**) at the end of the header.
Support = FullCure705;	Set the Support material name.
Color = *<Model material1 name>***;**	Set the name of a material loaded.
Resin2 = *<Model material2 name>***;**	Set the name of a material loaded.
Resin3 = *<Model material3 name>***;**	Set the name of a material loaded.
Resin4 = *<Model material4 name>***;**	Set the name of a material loaded.
Resin5 = *<Model material5 name>***;**	Set the name of a material loaded.
Resin6 = *<Model material6 name>***;**	Set the name of a material loaded.
Resin7 = *<Model material6 name>***;**	Set the name of a material loaded. (For J8 printers only.)

Important:

- *<Model material name>* represents the name of the model material loaded in the material The material names need to be listed exactly as they appear in the Stratasys software (not as they appear on the cartridge).

For example, if the material name in the software is VeroMgnt, and on the cartridge it is VeroMagenta enter VeroMgnt in the text file.

- In the *Resin Type* section, make sure that you list the model materials in the order they are loaded in the material cabinet
- Even if the job requires only some of the model materials loaded in the material cabinet:
    - when printing in High Speed mode, list only the names of the 3 model materials you are using for
    - when printing in High Mix or High Quality mode, list the names of all 6 model materials

Materials section—for J5 series

Parameters in File	Definition / Instruction
[Materials]	This is a section header. In this section you provide the paths to the bitmaps of each of the materials (resins) in the order listed above. Do not add a semi colon (**;**) at the end of the header.
Material1 = C:*<path to color bmp>**<material1 filename>*_**xxxx.bmp**	
Material2 = C:*<path to color bmp>**<material2 filename>*_**xxxx.bmp**	
Material3 = C:*<path to color bmp>**<material3 filename>*_**xxxx.bmp**	
Material4 = C:*<path to color bmp>**<material3 filename>*_**xxxx.bmp**	
Material5 = C:*<path to color bmp>**<material3 filename>*_**xxxx.bmp**	

Materials section—for J7 and J8 series

In High Speed mode, where there are only 3 materials are used for printing

Parameters in File	Definition / Instruction
[Materials]	This is a section header. In this section you provide the paths to the bitmaps of each of the materials (resins) in the order listed above. Do not add a semi colon (**;**) at the end of the header.
Material1 = C:*<path to color bmp>**<material1 filename>*_**xxxx.bmp**	
Material2 = C:*<path to color bmp>**<material2 filename>*_**xxxx.bmp**	
Material3 = C:*<path to color bmp>**<material3 filename>*_**xxxx.bmp**	

In High Quality and High Mix modes, where there are 6 materials loaded:

Parameters in File	Definition / Instruction
[Materials]	This is a section header. In this section you provide the paths to the bitmaps of each of the materials (resins) in the order listed above. Do not add a semi colon (**;**) at the end of the header.
Material1 = C:\<path to color bmp>\<material1 filename>_**xxxx.bmp**	
Material2 = C:*<path to color bmp>\<material2 filename>*_**xxxx.bmp**	
Material3 = C:*<path to color bmp>\<material3 filename>*_**xxxx.bmp**	
Material4 = C:*<path to color bmp>\<material4 filename>*_**xxxx.bmp**	
Material5 = C:*<path to color bmp>\<material5 filename>*_**xxxx.bmp**	
Material6 = C:*<path to color bmp>\<material6 filename>*_**xxxx.bmp**	
Material7 = C:*<path to color bmp>\<material6 filename>*_**xxxx.bmp** (For J8 printers only.)	

- Make sure that the path to the BMP files correspond to the order in which the materials are listed in the *Resin Type*
  For example, if material1 is VeroCyan, the path should be to the cyan BMP files.
- These represent the number of digits in the bitmap filenames. If you use four digits in the bitmap filename, include four 'x's in the material If you use five digits in the bitmap filename, include five 'x's in the material definitions.
- The 'x's in the material definition must be in lower-case.

## Generating a GrabCAD Voxel File from BMPs

After preparing the BMP file and TXT file, you need to process them in the Voxel Print Utility in GrabCAD Print. This utility generates a GrabCAD voxel file (*.*gcvf* file) that you import into GrabCAD Print for printing.

To generate GrabCAD voxel files from BMP files:

1. Open GrabCAD
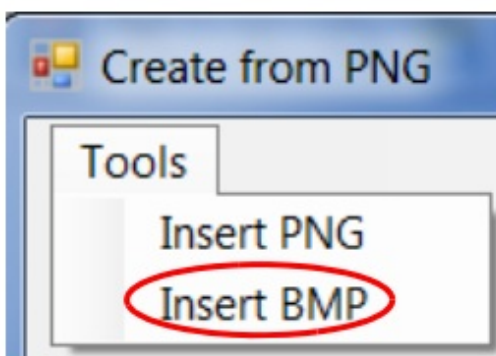2. From the *Apps* menu, select **Launch Voxel Print Utility**.
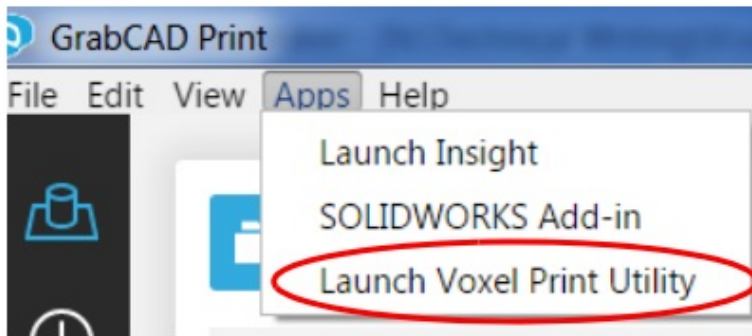
The Voxel Print Utility opens.
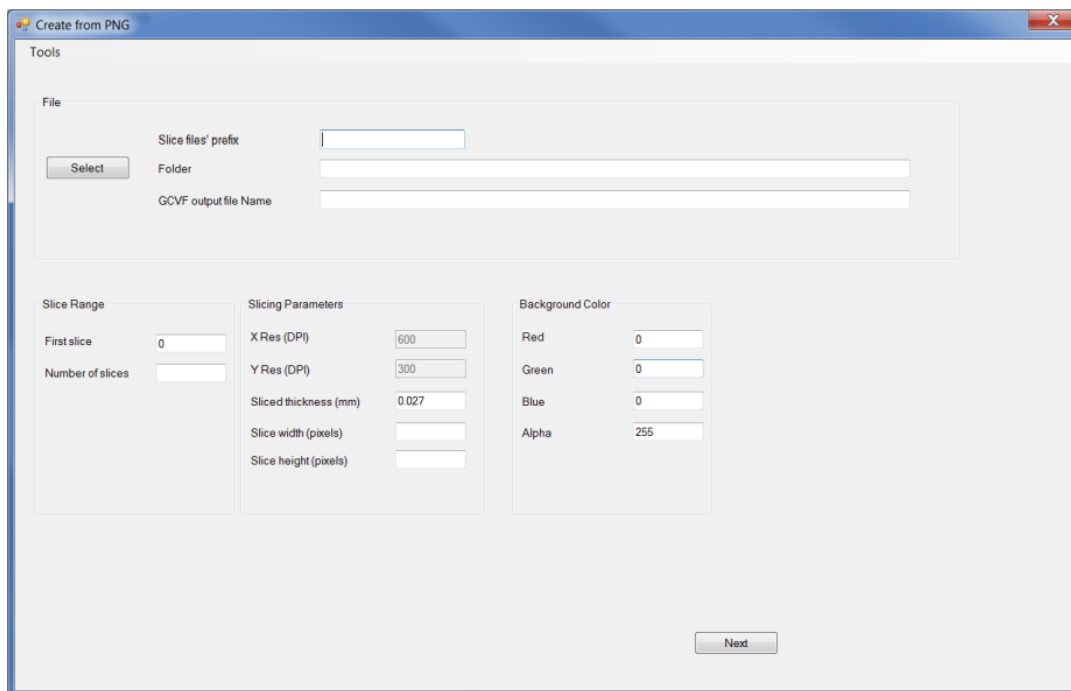
Important: Slicing Parameters for J5-Series Printers

- Slice resolution = 300 x 300 DPI
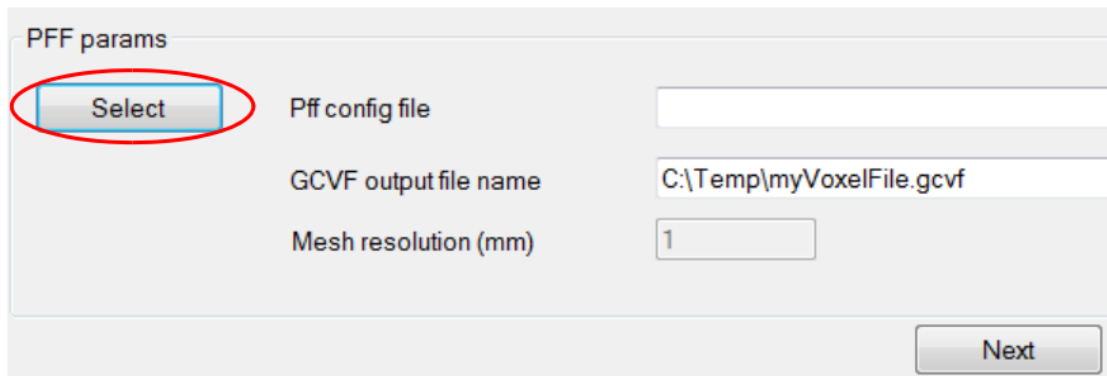- Slice thickness = 01875 mm

From the *Tools* menu, select **Insert BMP**

1. In the *Pff params* area:
    1. Click **Select** and navigate to the folder that contains the BMP

Select the voxel configuration text file (*.txt* file) you created (see **"Slice Preparation Guidelines" on page 5**).
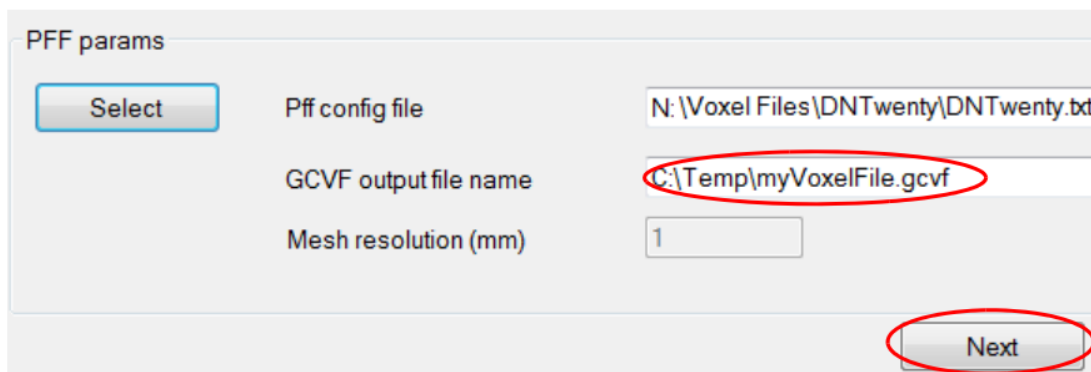
In the *GCVF output file name* field, enter the desired location and name of the generated *.gcvf* file

Click **Next**.

A progress bar shows the progress of the *.gcvf* file generation
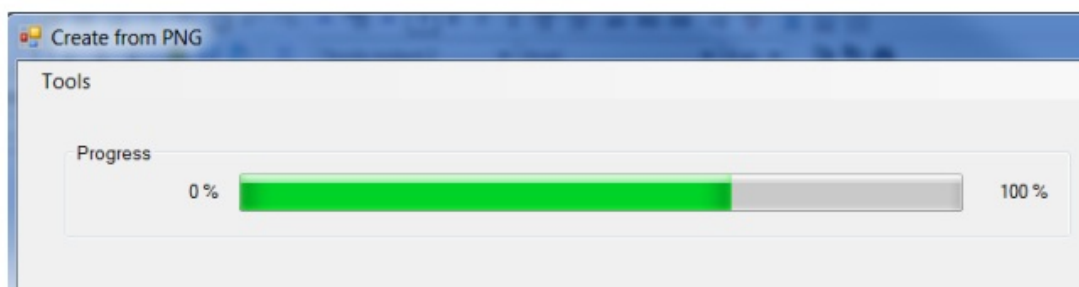
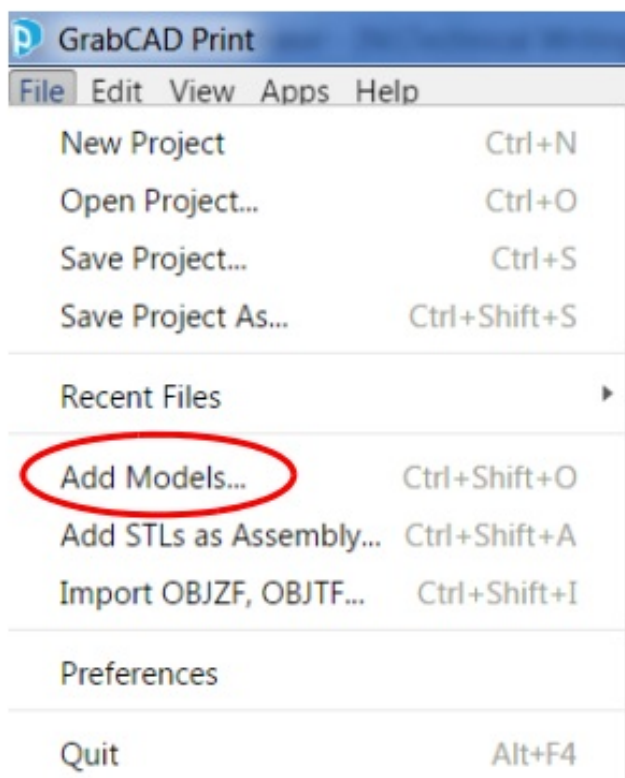The file generation can take a few minutes, depending on the size of the file.
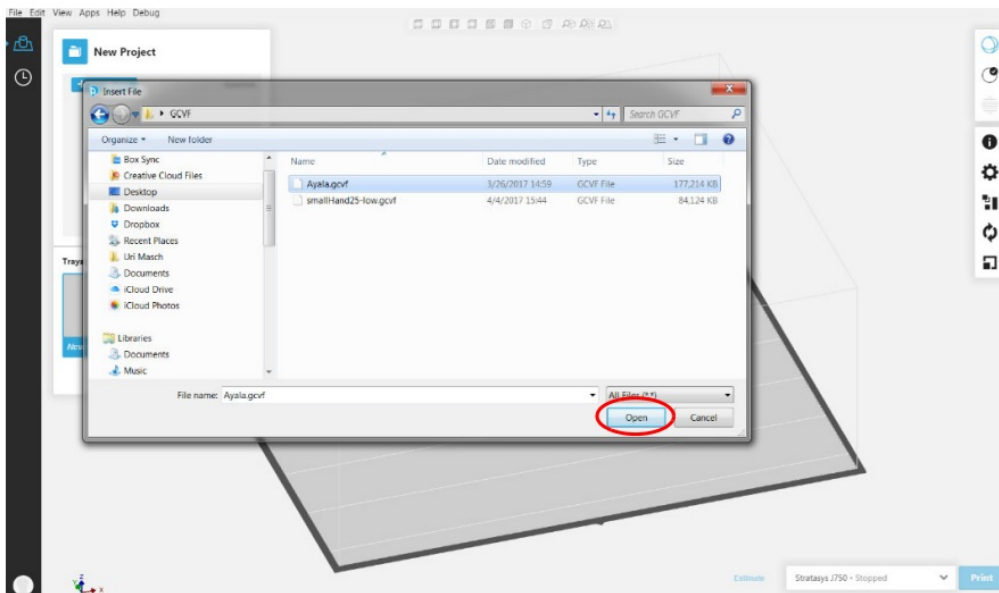

When done, the following message appears.
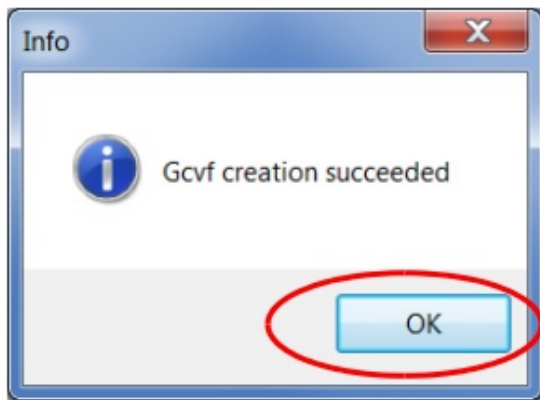
1. Click **OK** to close the
2. Close the Voxel Printing
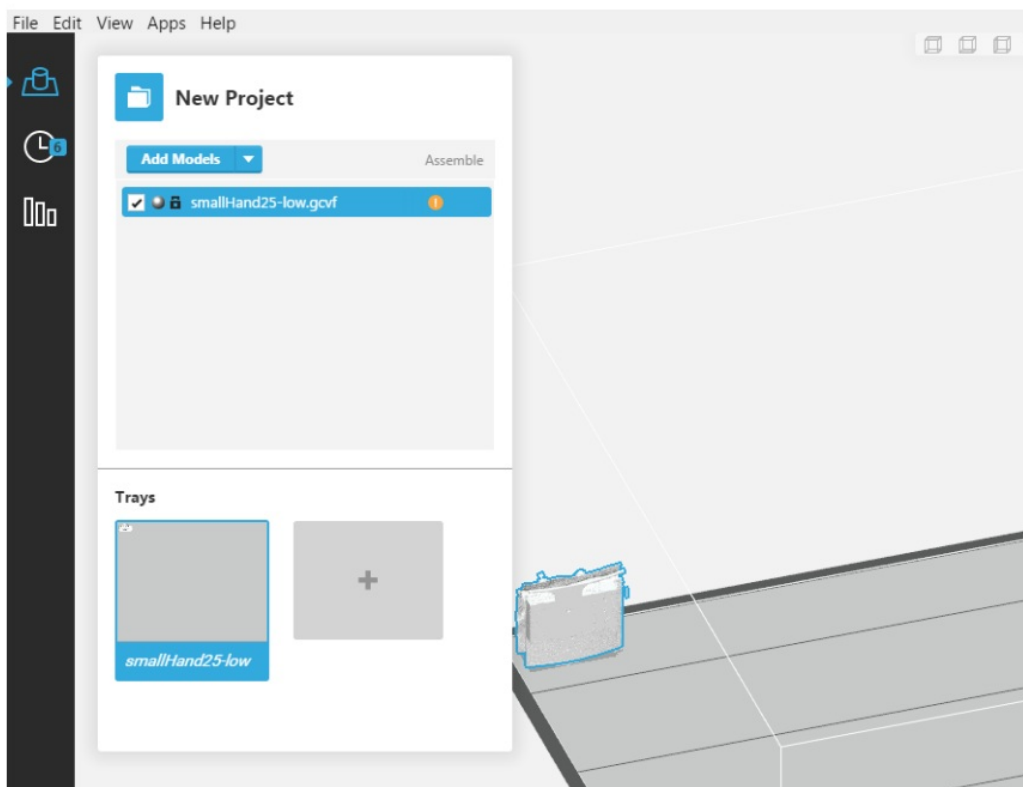3. To print the voxel file, continue with

Printing a Voxel Print Job

To print a voxel print job:From the *File* menu, select Add Models.

1. Navigate to the location of the *.gcvf* file you generated, select it, and click **Open**.
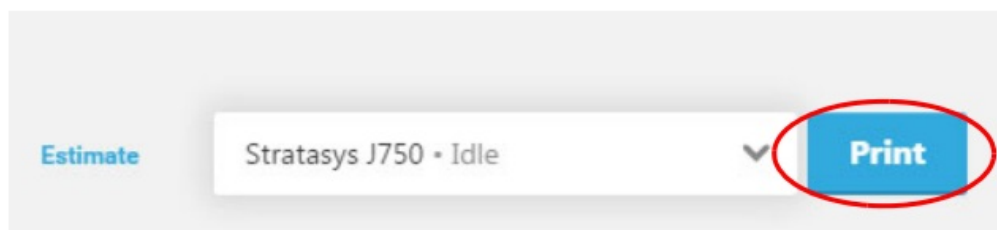
GrabCAD Print validates the file and loads it.

Click **Print** to send the file to

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Guide to Voxel Printing with GrabCAD Print™ Stratasys J5™ / J7™ / J8™ 3D Printers **stratasys**	**Stratasys J5 GrabCAD Print** [pdf] User Manual J5 GrabCAD Print, J5, GrabCAD Print, Print

References

- ♦ **Stratasys - Industrial 3D Printing Manufacturers**
- ♦ **Terms and Conditions of Sale**

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