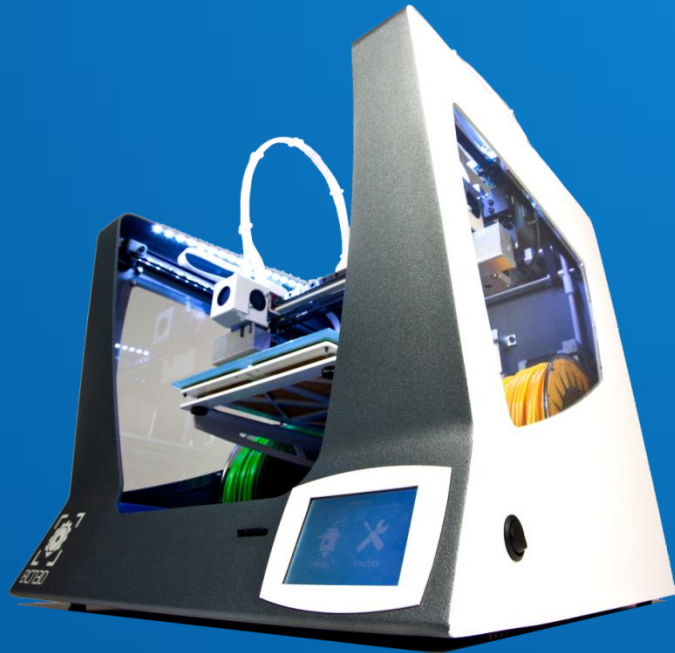


BCN3D SIGMA

- BALTAL -



BALTAL TEAM

www.3dprinter.ee

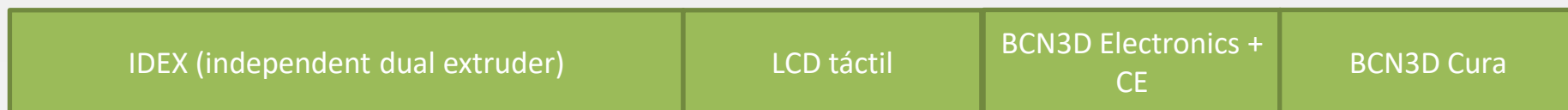
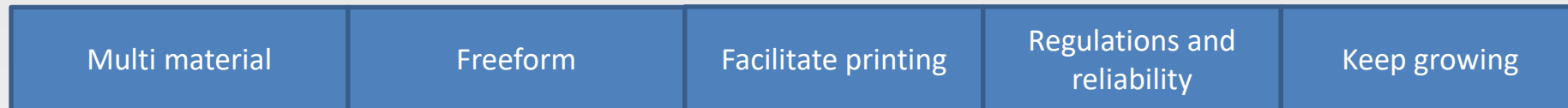
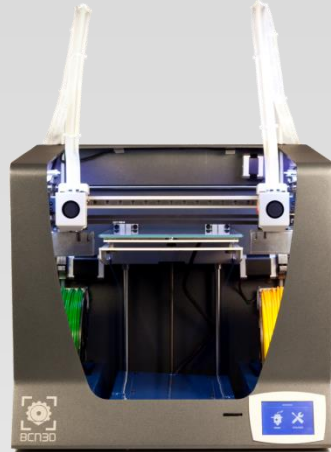
Rainer Kivimäe



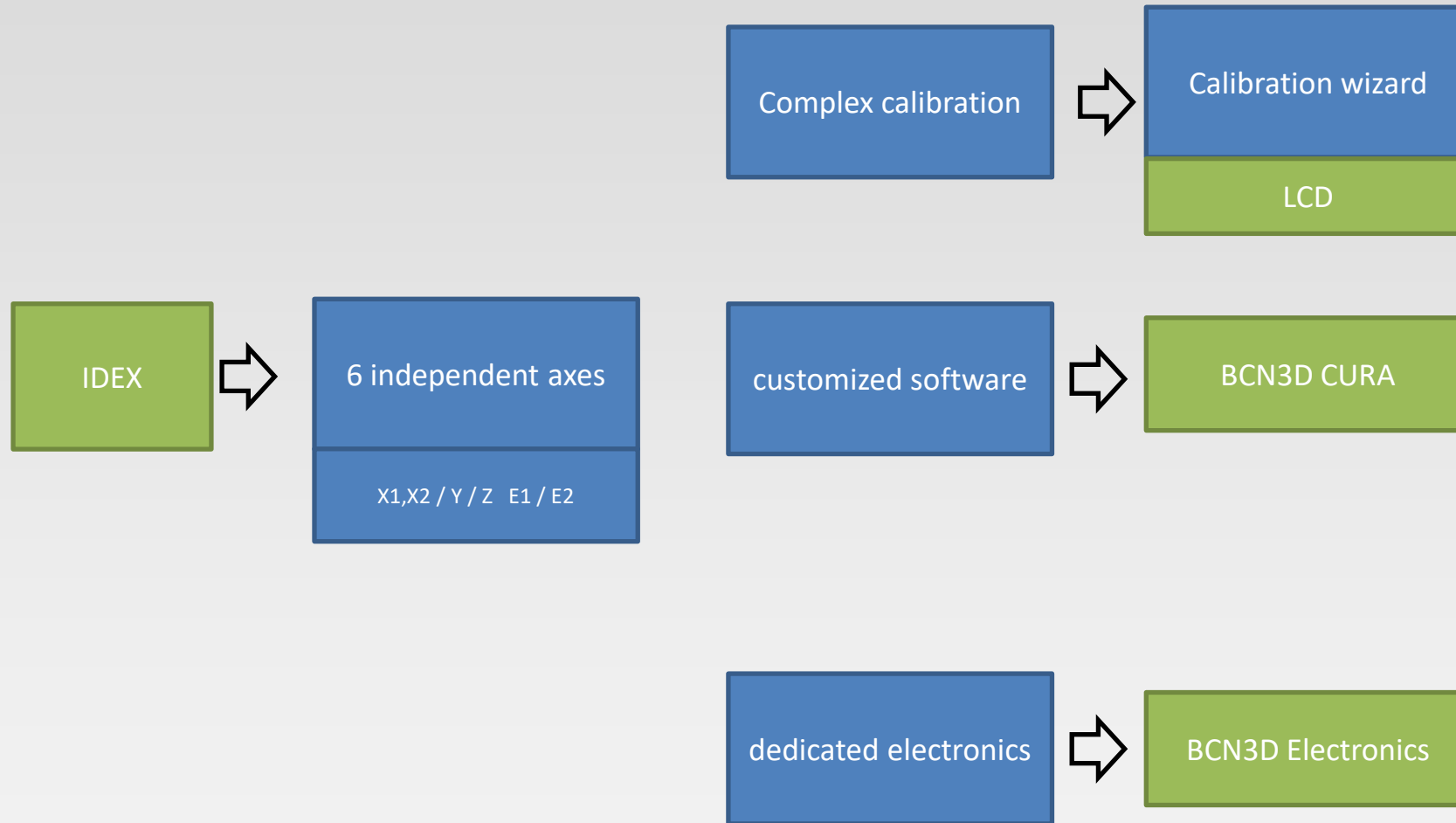
- BCN3D Sigma main specs.
- Unboxing & Fine-Tuning.
- Loading Filament
- Calibration.
- Printing workflow.
 - Tips when designing and exporting.
 - BCN3D CURA.
 - Basic parameters.
 - gcode workflow (tower, perimeters, infill...)
 - Printing with one extruder.
 - Printing with two extruders.
 - Printing with supports.
 - Exporting gcode to SD card.
- Materials.
- Operation tips.
- Basic maintenance.
 - Changing the hotend
 - Cleaning the hotend
 - Broken filament inside the bowden tube.
 - Firmware and software updates.
- Additional information.



BCN3D SIGMA MAIN SPECS



BCN3D SIGMA MAIN SPECS



BCN3D SIGMA MAIN SPECS



- Technology: Independent Dual Extruder (IDEX)
- Manufacturing technology: Fused Filament Fabrication (FFF)
- Printing Volume: 210 x 297 x 210 mm
- Layer height: 0,05-0,35 mm (with a standard 0,4 mm nozzle)
- Positioning resolution: X axis 0,675 mm / Y axis 0,012 mm / Z axis 0,001 mm
- Max. Extruder temperature: 280° C
- Max. Heated bed temperature: 115° C
- Firmware: BCN3D Sigma specific (based on Marlin)
- 3,5" Touch Screen
- Full Metal BCN3D Nozzle v3
- Electronics: BCN3D Electronics (6 axis)
- CE Certification
- Open Source
- Filament diameter: 3 mm
- Compatible materials: PLA, ABS, PVA, Nylon, Flexible, composites.
- Electrical energy consumption: 300 W



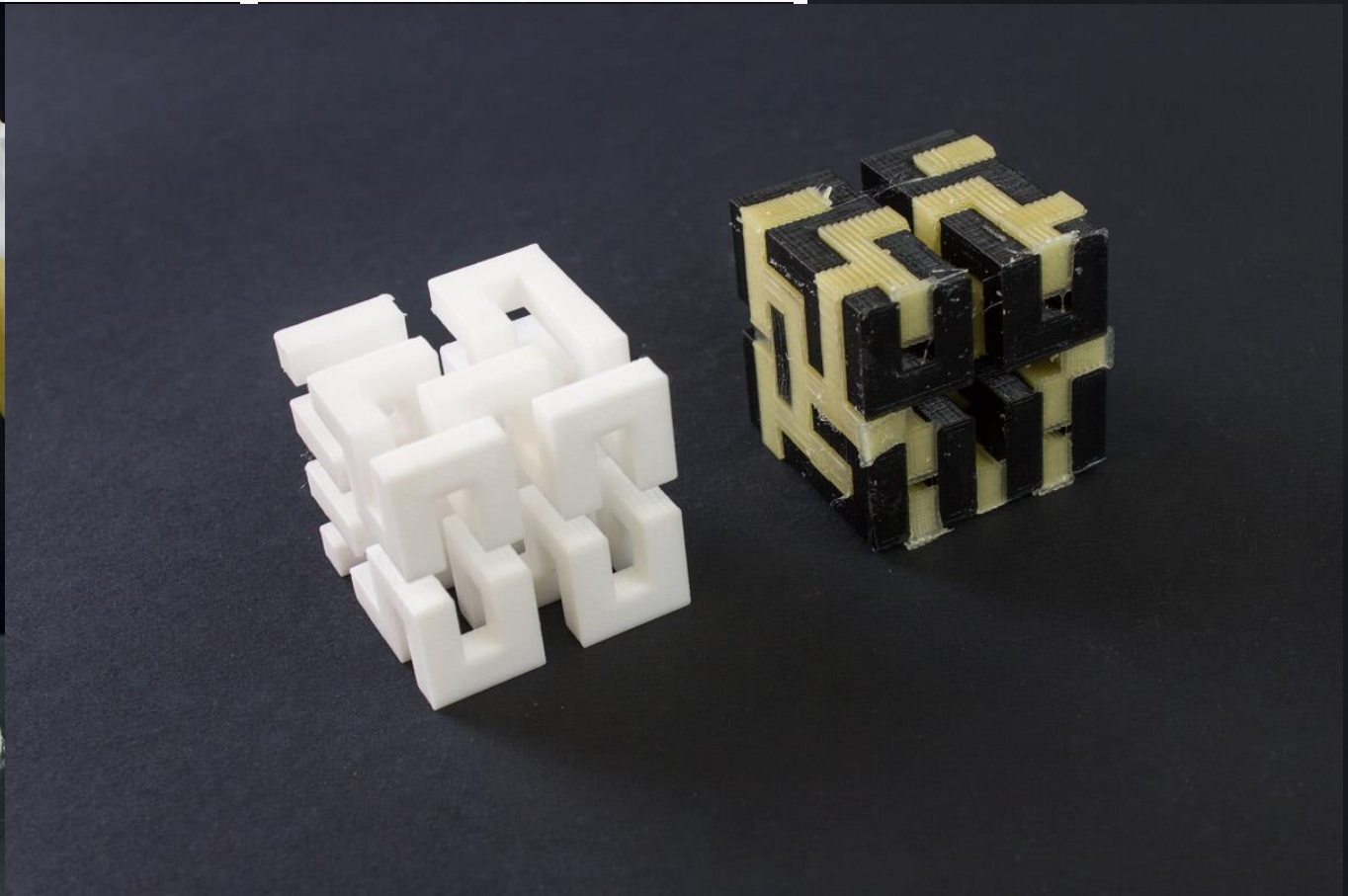
BCN3D SIGMA MAIN SPECS



WHAT CAN WE ACHIEVE?



DUAL EXTRUDER



MONOEXTRUDER



SUPPORTS

UNBOXING & FINE-TUNING

▶ UNBOXING & FINE-TUNING



YOUTUBE SUPPORT VIDEOS IN OUR CHANNEL → <https://www.youtube.com/user/REPRAPBCN>

GET STARTED LIST → <https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>



UNBOXING

FINE-TUNING

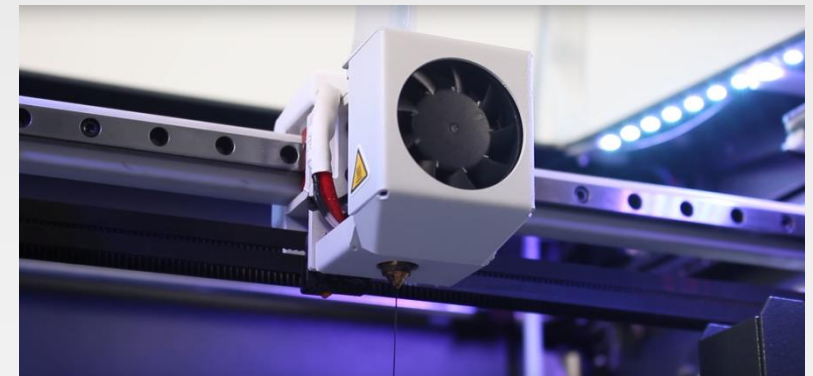
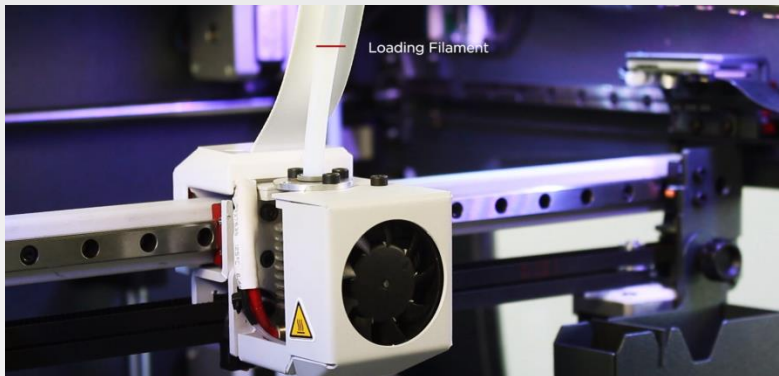
LOADING FILAMENT

LOADING FILAMENT



YOUTUBE SUPPORT VIDEOS IN OUR CHANNEL → <https://www.youtube.com/user/REPRAPBCN>

GET STARTED LIST → <https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>



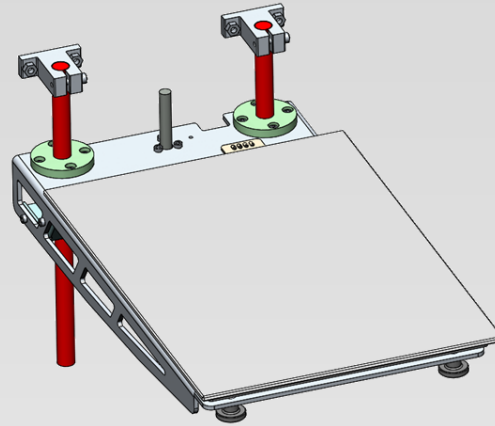
LOADING FILAMENT

CALIBRATION

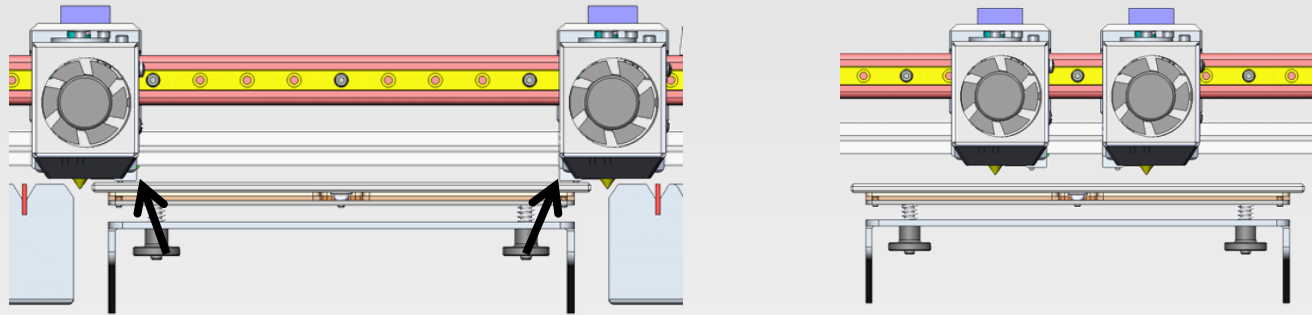
CALIBRATION



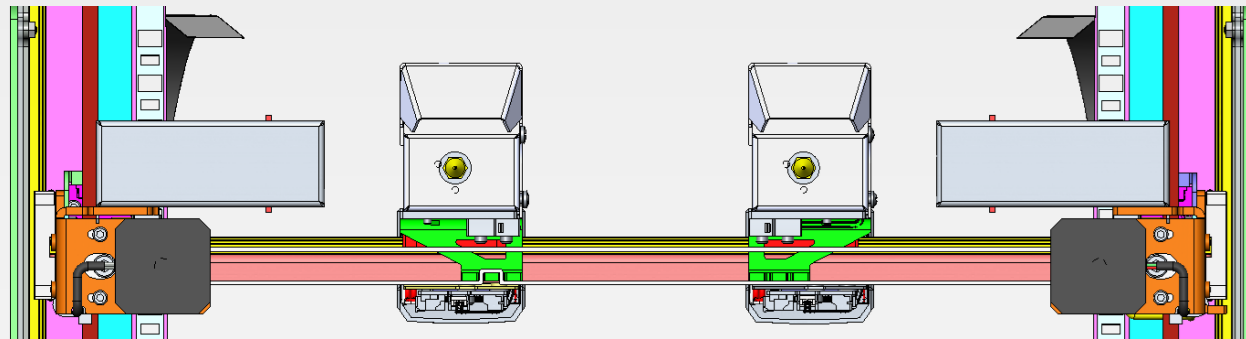
BED CALIBRATION



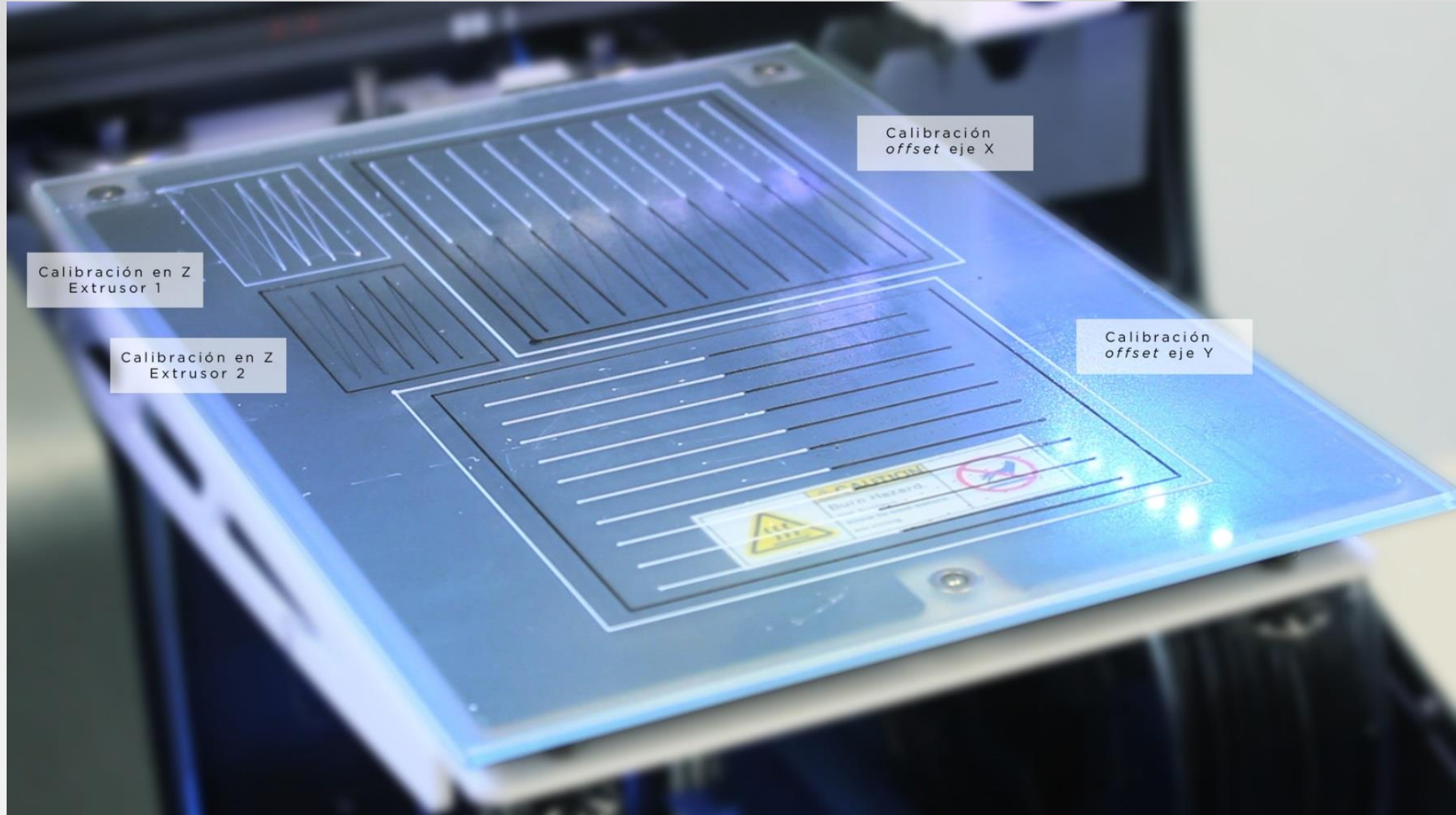
Z OFFSET CALIBRATION



X and Y OFFSET
CALIBRATION



▶ CALIBRATION



Calibración en Z
Extrusor 1

Calibración en Z
Extrusor 2

Calibración
offset eje X

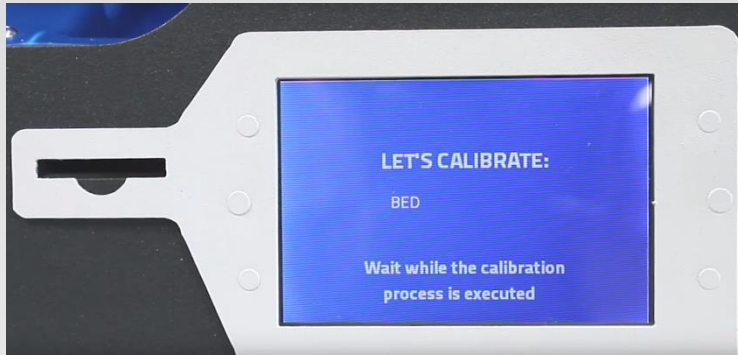
Calibración
offset eje Y

▶ CALIBRATION



YOUTUBE SUPPORT VIDEOS IN OUR CHANNEL → <https://www.youtube.com/user/REPRAPBCN>

GET STARTED LIST → <https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>



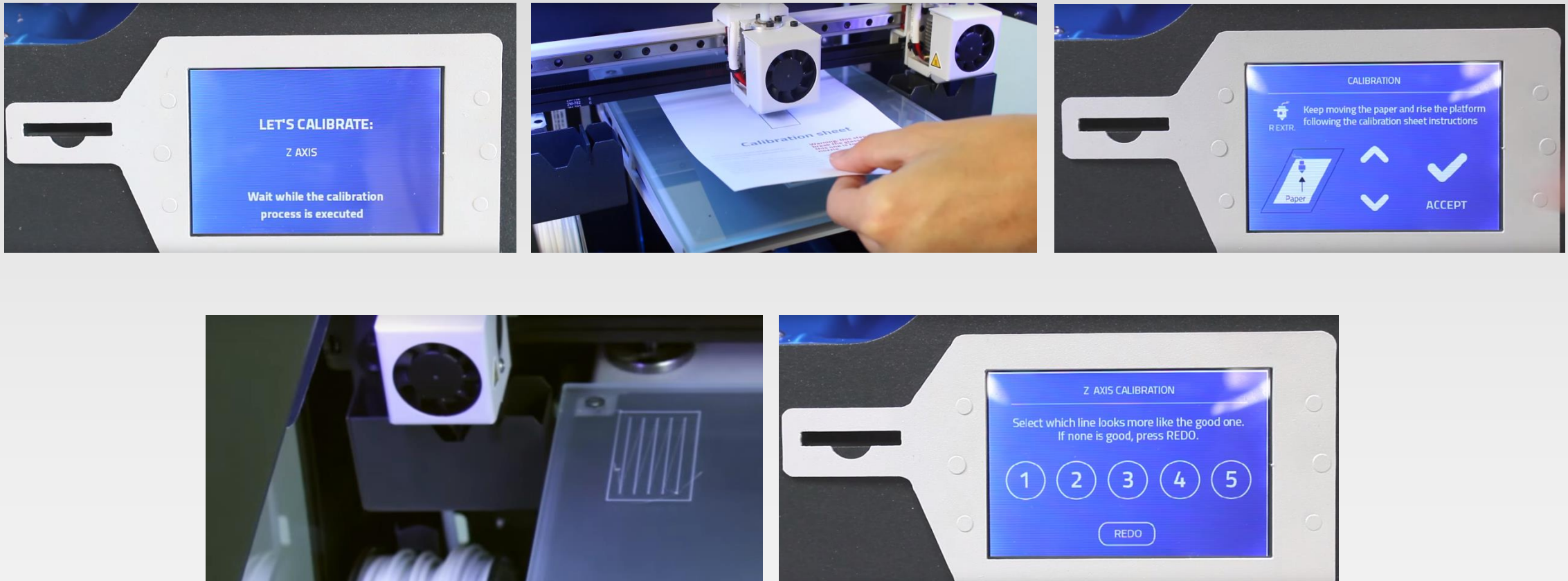
BED CALIBRATION

CALIBRATION



YOUTUBE SUPPORT VIDEOS IN OUR CHANNEL → <https://www.youtube.com/user/REPRAPBCN>

GET STARTED LIST → <https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>



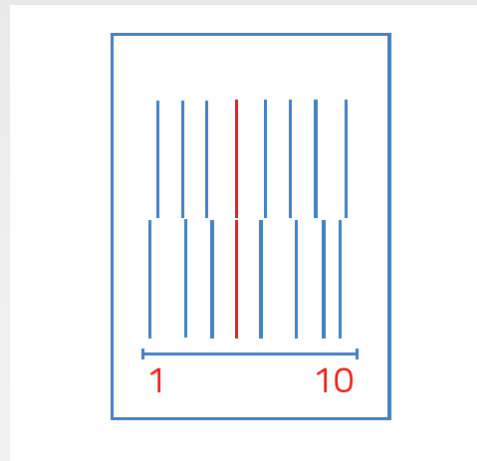
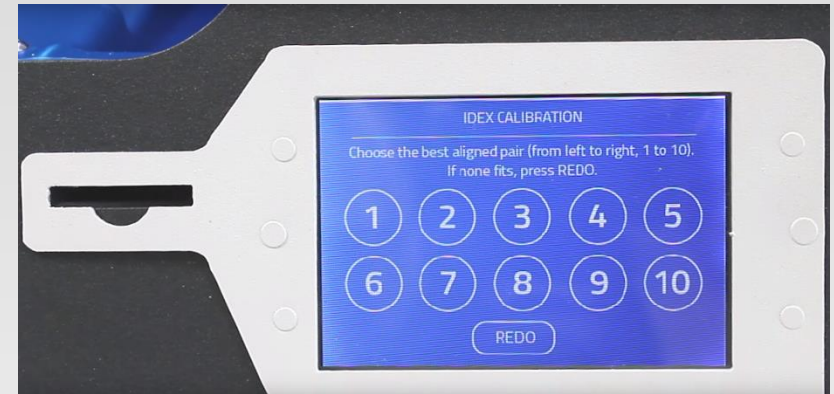
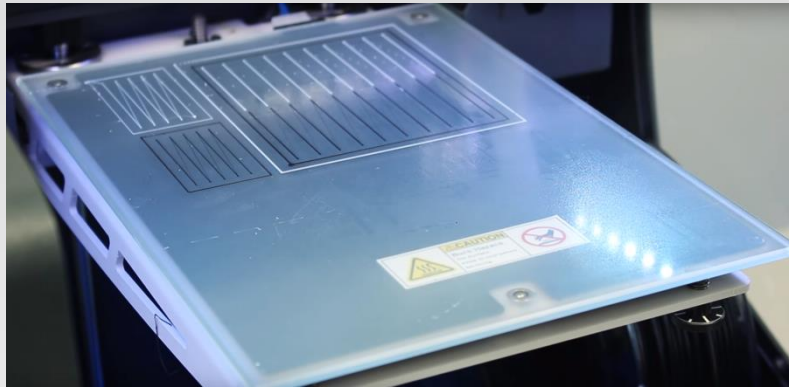
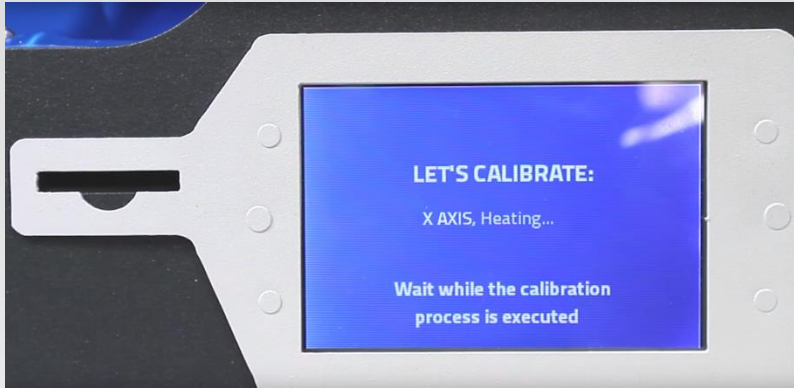
Z OFFSET CALIBRATION

CALIBRATION



YOUTUBE SUPPORT VIDEOS IN OUR CHANNEL → <https://www.youtube.com/user/REPRAPBCN>

GET STARTED LIST → <https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>



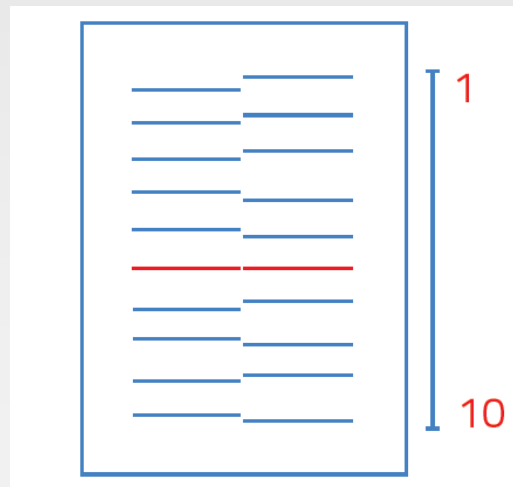
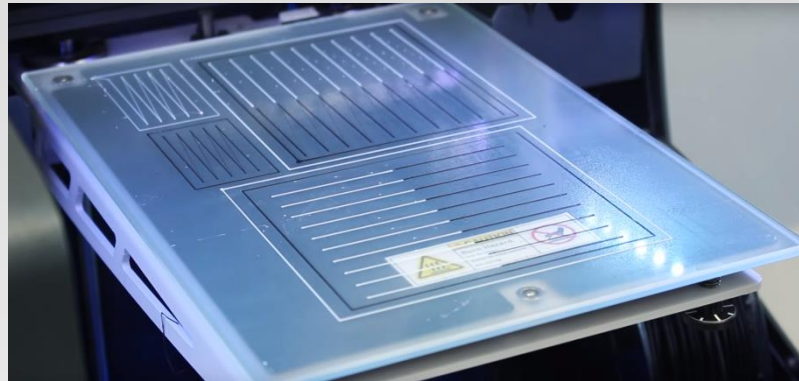
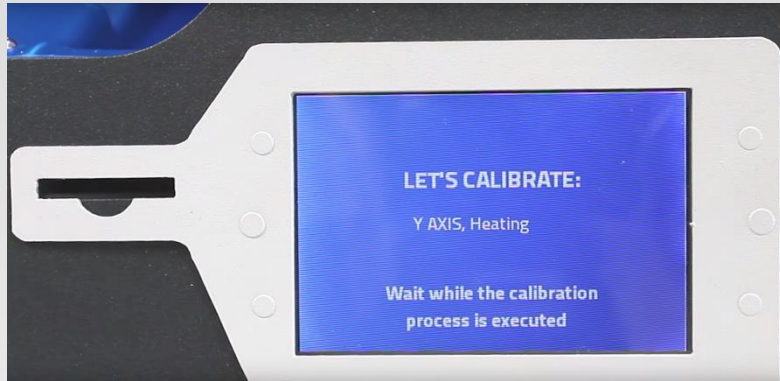
X OFFSET CALIBRATION

CALIBRATION



YOUTUBE SUPPORT VIDEOS IN OUR CHANNEL → <https://www.youtube.com/user/REPRAPBCN>

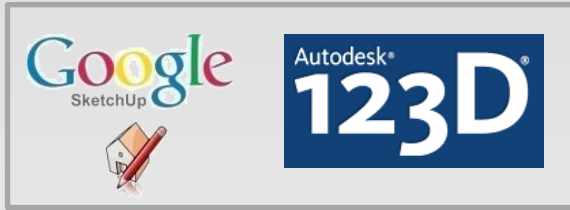
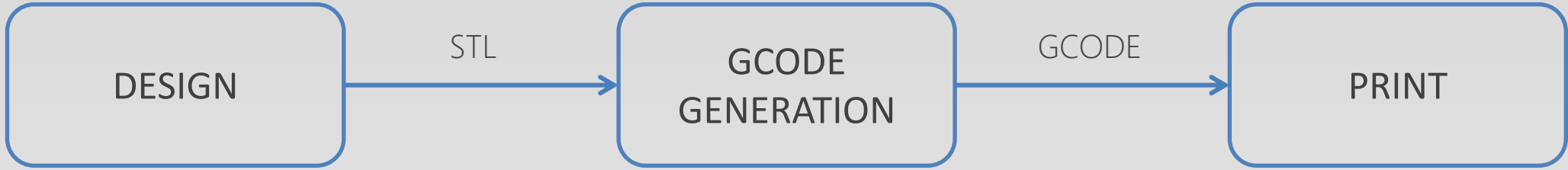
GET STARTED LIST → <https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>



Y OFFSET CALIBRATION

PRINTING WORKFLOW

▶ PRINTING WORKFLOW



Free



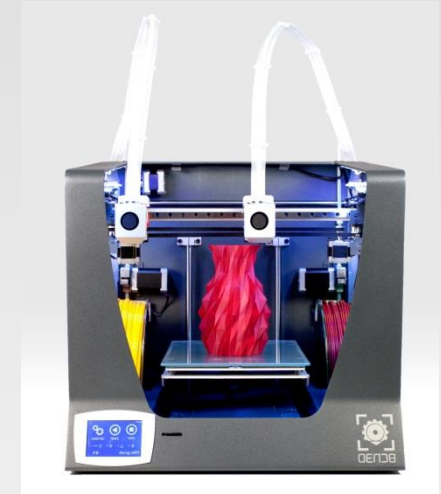
Recommended



Professional



Others



▶ PRINTING WORKFLOW



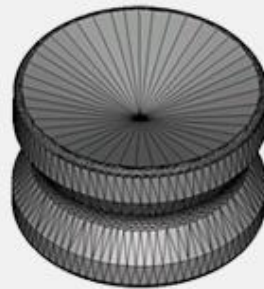
DESIGN

Tips when designing and exporting:

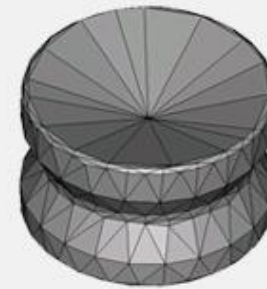
- Geometries with less than 1 mm thickness are susceptible of not appear in the print.
- Tight walls will result in weak parts.
- We should export the design to STL format
- When exporting must take into account the quality of the exportation.



DEMASIADA RESOLUCIÓN
N° TRIÁNGULOS: 18.674
PESO FICHERO: 911 K



MALLADO CORRECTAMENTE
N° TRIÁNGULOS: 4.614
PESO FICHERO: 225 KB



POCA RESOLUCIÓN
N° TRIÁNGULOS: 698
PESO FICHERO: 34 KB

- An STL file is a closed surface composed of triangles. The smaller these triangles, the higher resolution of the final file.

▶ PRINTING WORKFLOW



BCN3D CURA:

Is the software that converts STL files into the correct format for the machine to start printing (Gcode). Generates machine code.

- Customized software

The IDEX requires a customized and upgradeable platform.

- Unique program for printing

BCN3D Cura allows to work with just one software.

- Updates

BCN3D Cura will automatically detect firmware and software updates.

- Configurations

Given the new printing possibilities, BCN3D Cura has all the possible combinations of materials in their settings.

GCODE
GENERATION



▶ PRINTING WORKFLOW



BCN3D CURA:

Available in our Github.

GCODE
GENERATION



Descarga de BCN3D Cura

<https://github.com/BCN3D>

BCN3D wiki:

<https://github.com/BCN3D/BCN3D-Cura-Windows/wiki>

▶ PRINTING WORKFLOW



BCN3D CURA DEMONSTRATION:

Basic parameters.

Gcode workflow (tower, perimeters, infill...).

Printing with one extruder.

Printing with two extruders.

Printing with supports.

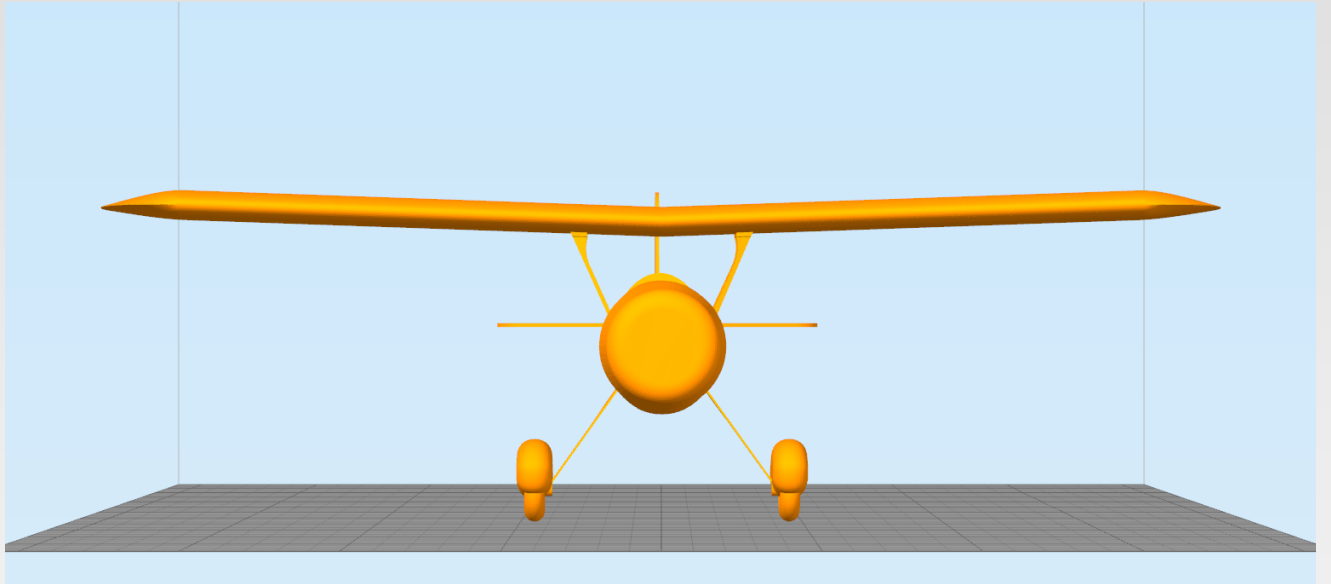
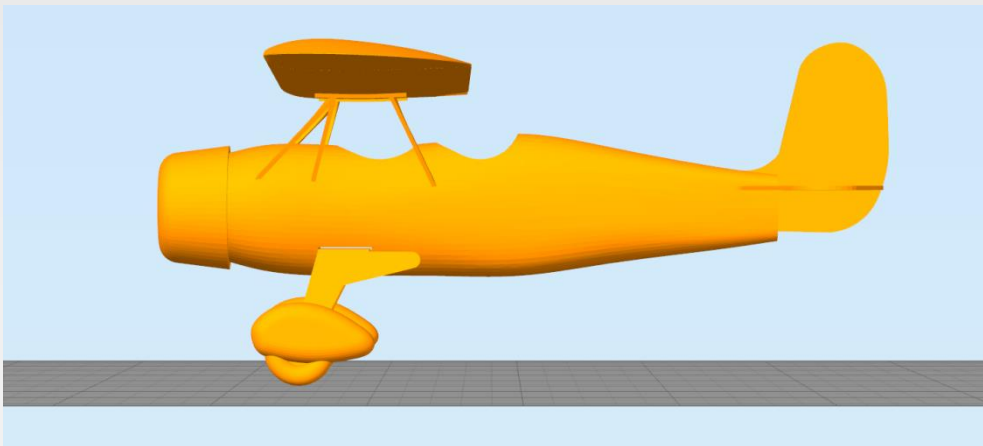
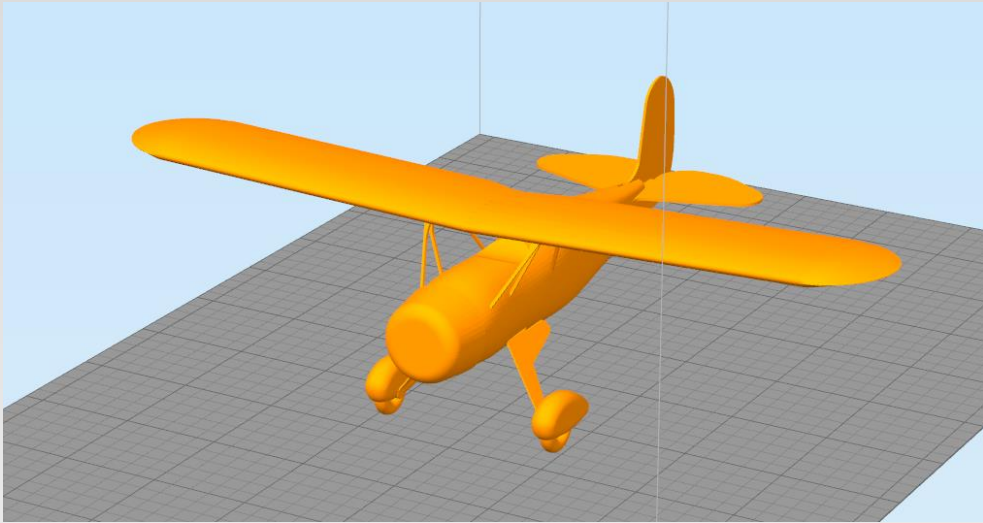
Exporting gcode to SD card.

GCODE
GENERATION

▶ PRINTING WORKFLOW



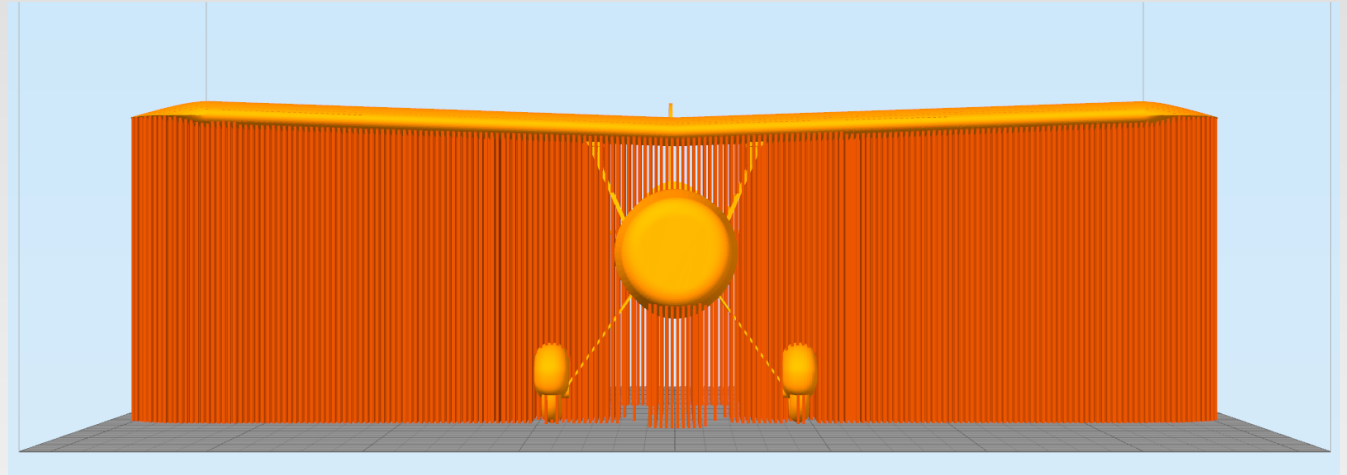
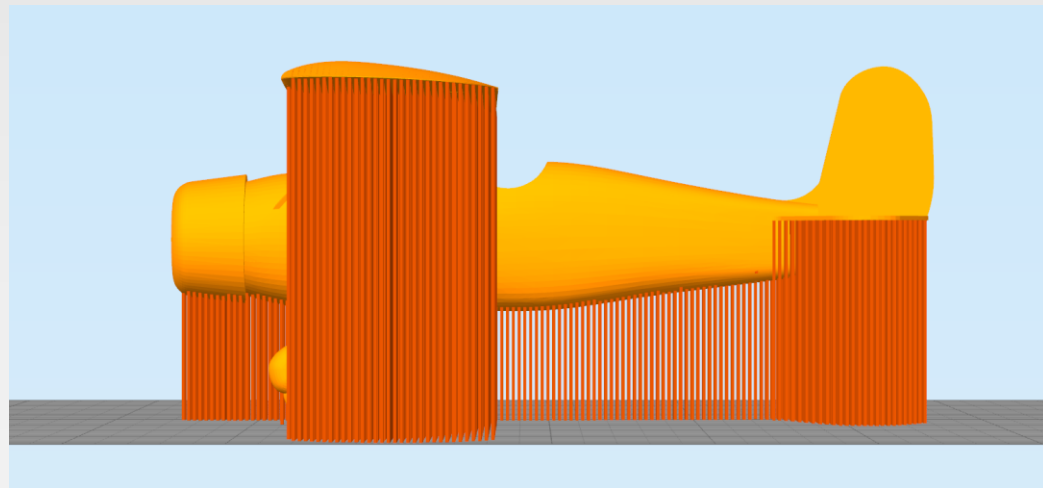
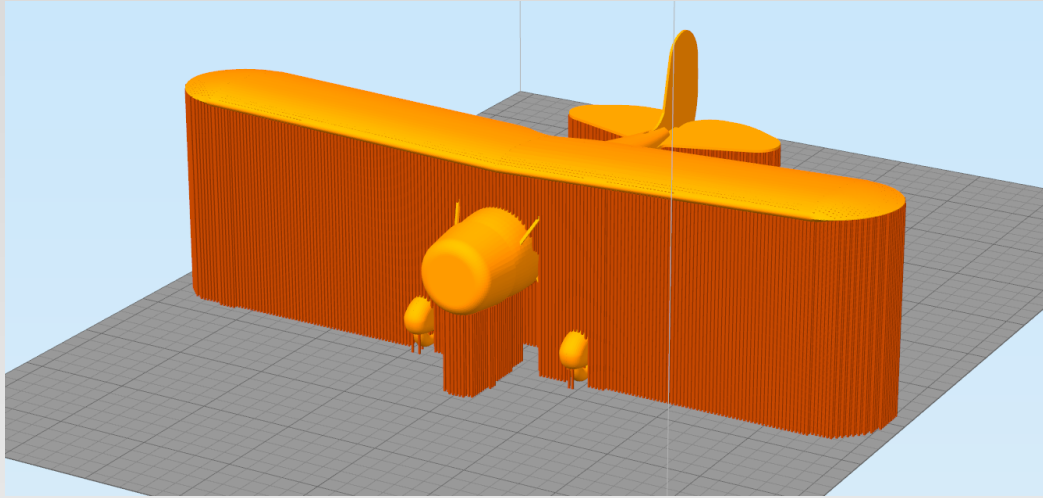
GCODE
GENERATION



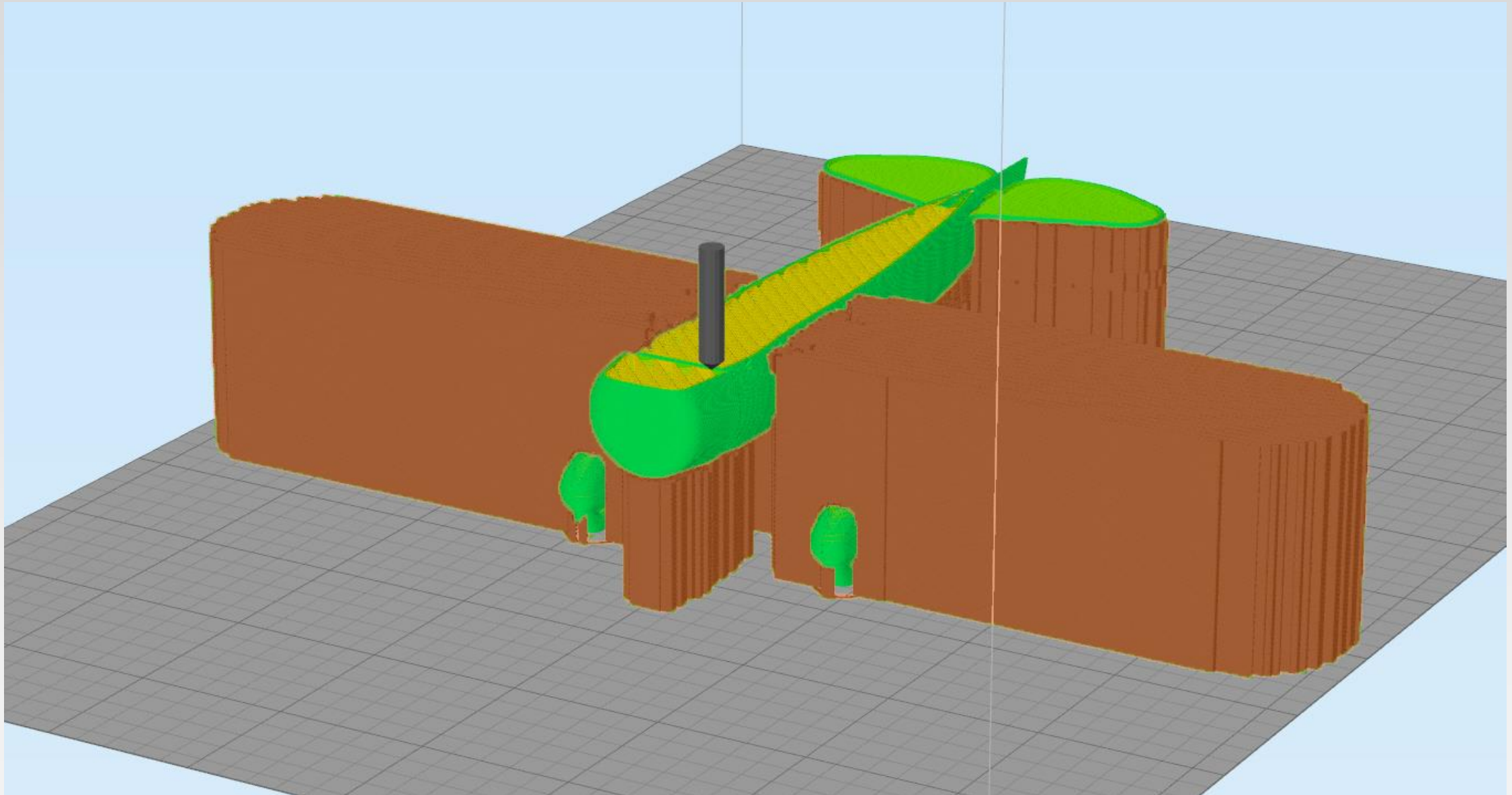
▶ PRINTING WORKFLOW



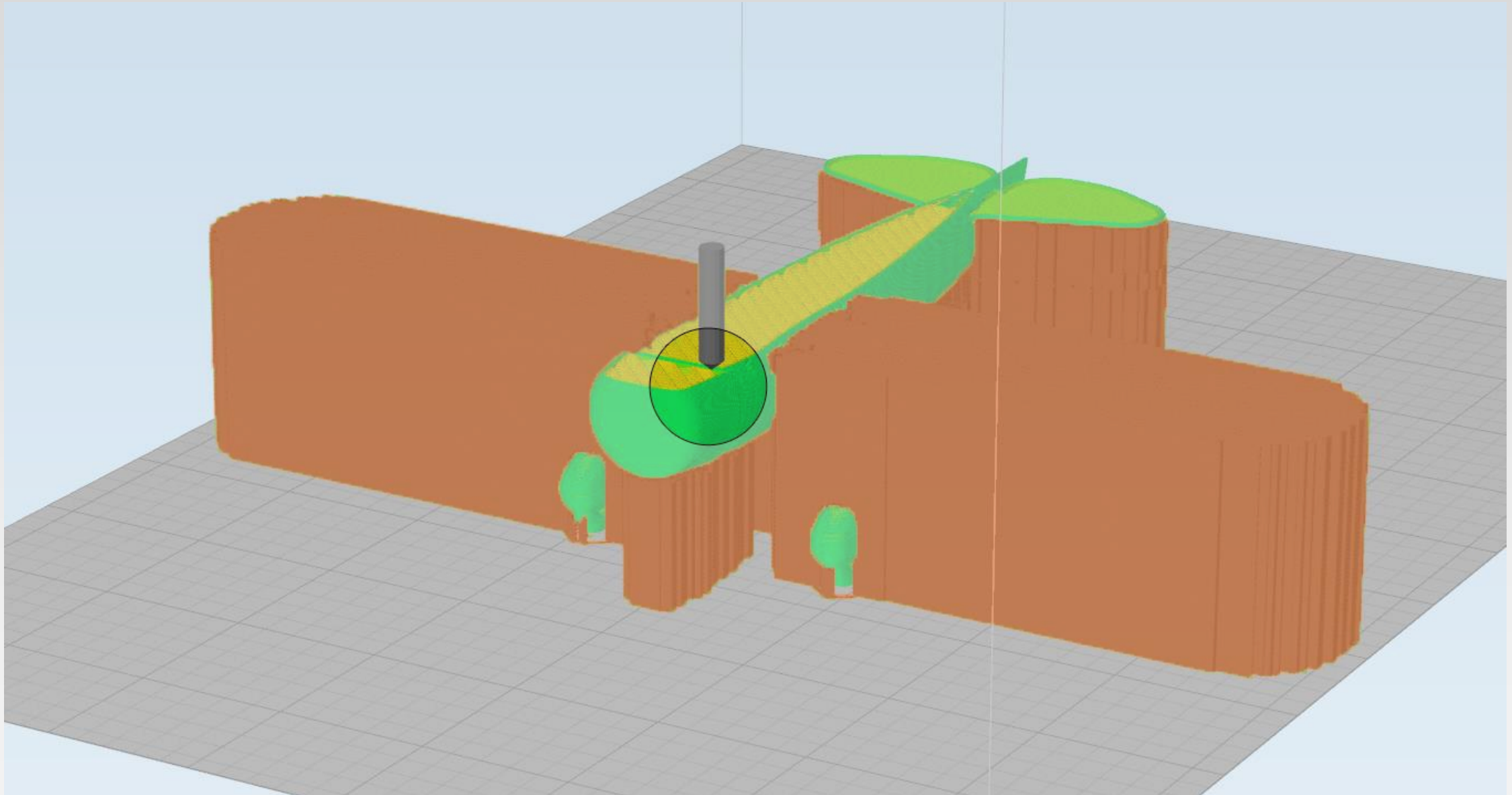
GCODE
GENERATION



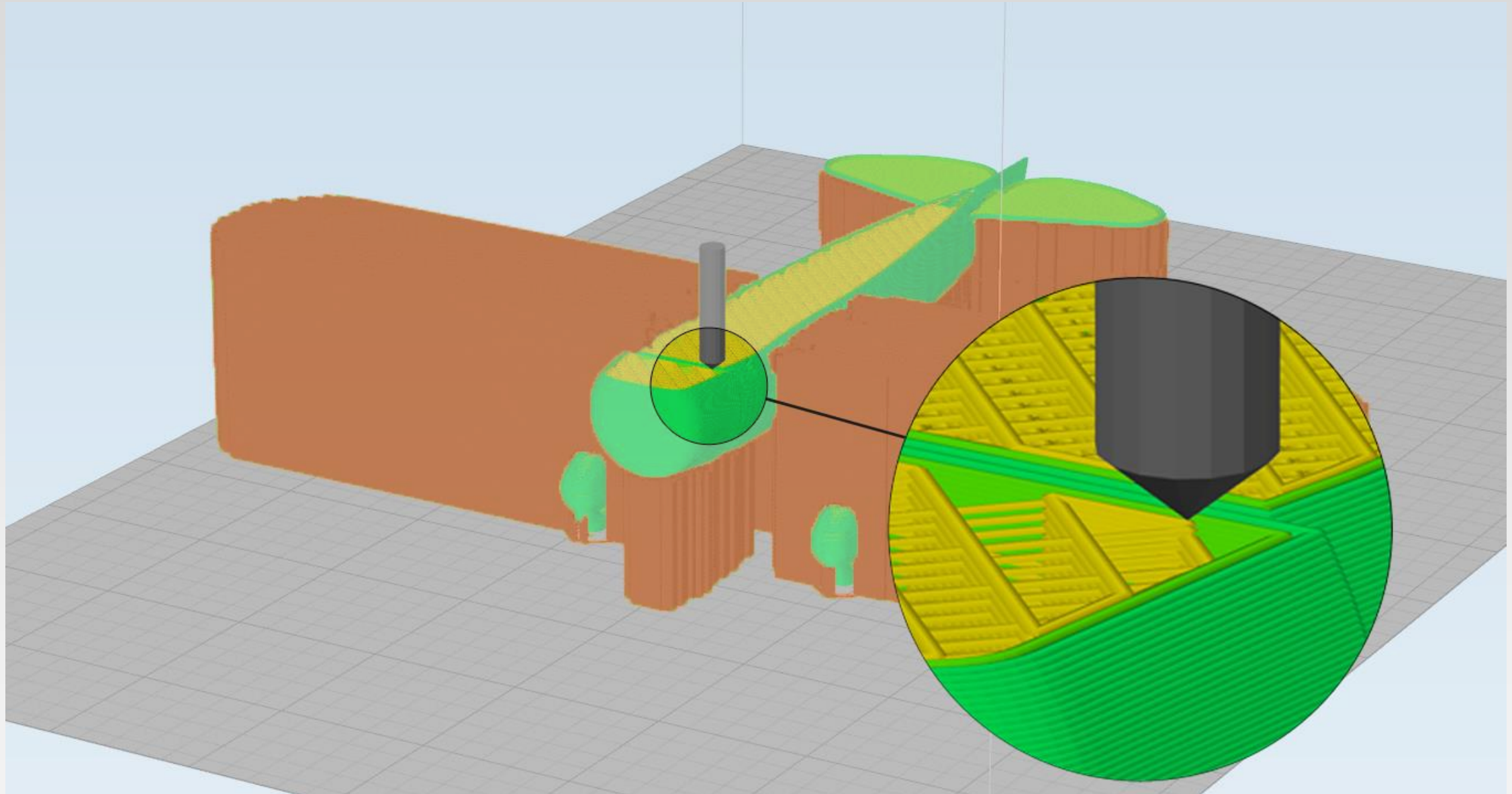
▶ PRINTING WORKFLOW



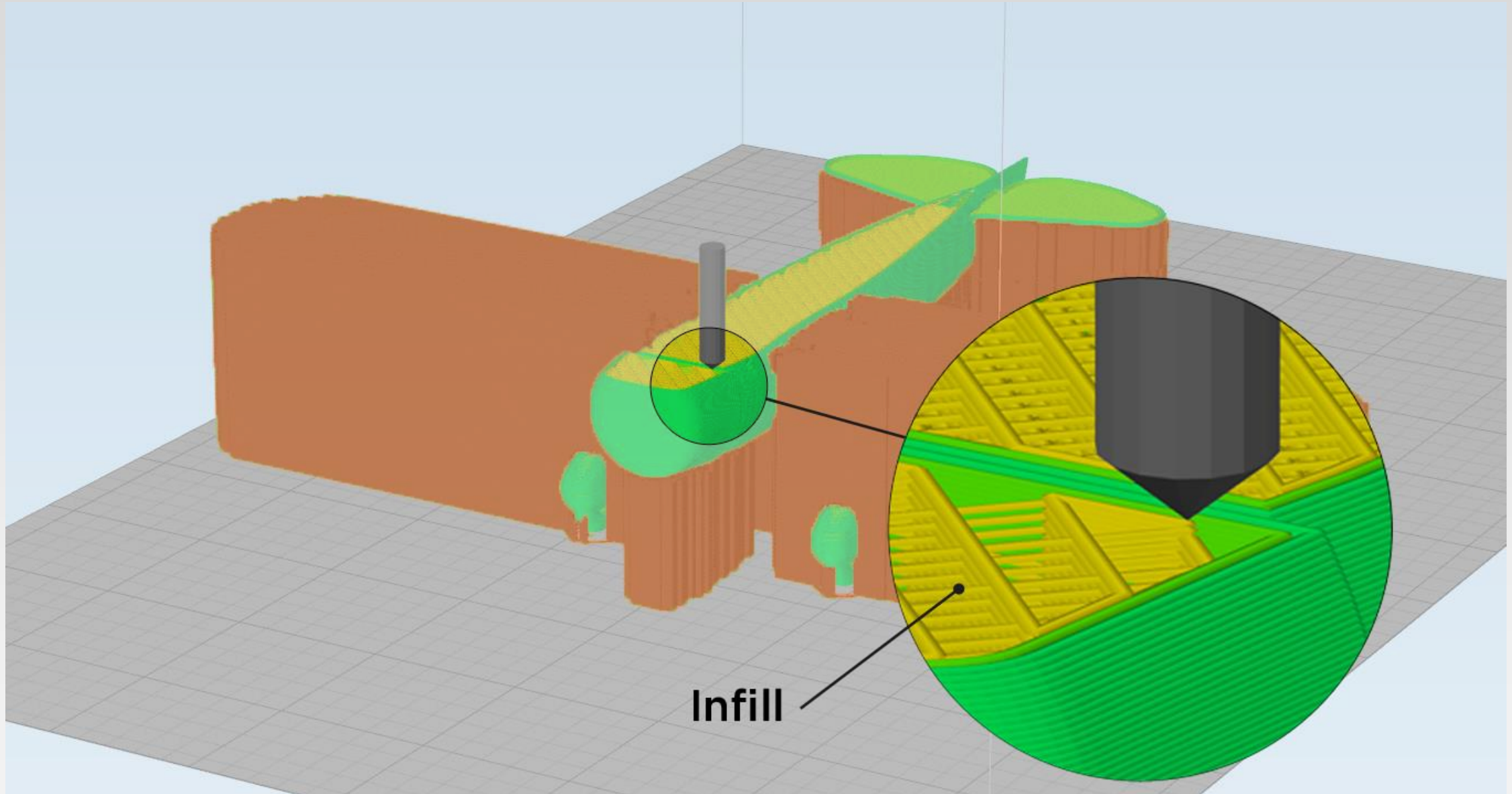
▶ PRINTING WORKFLOW



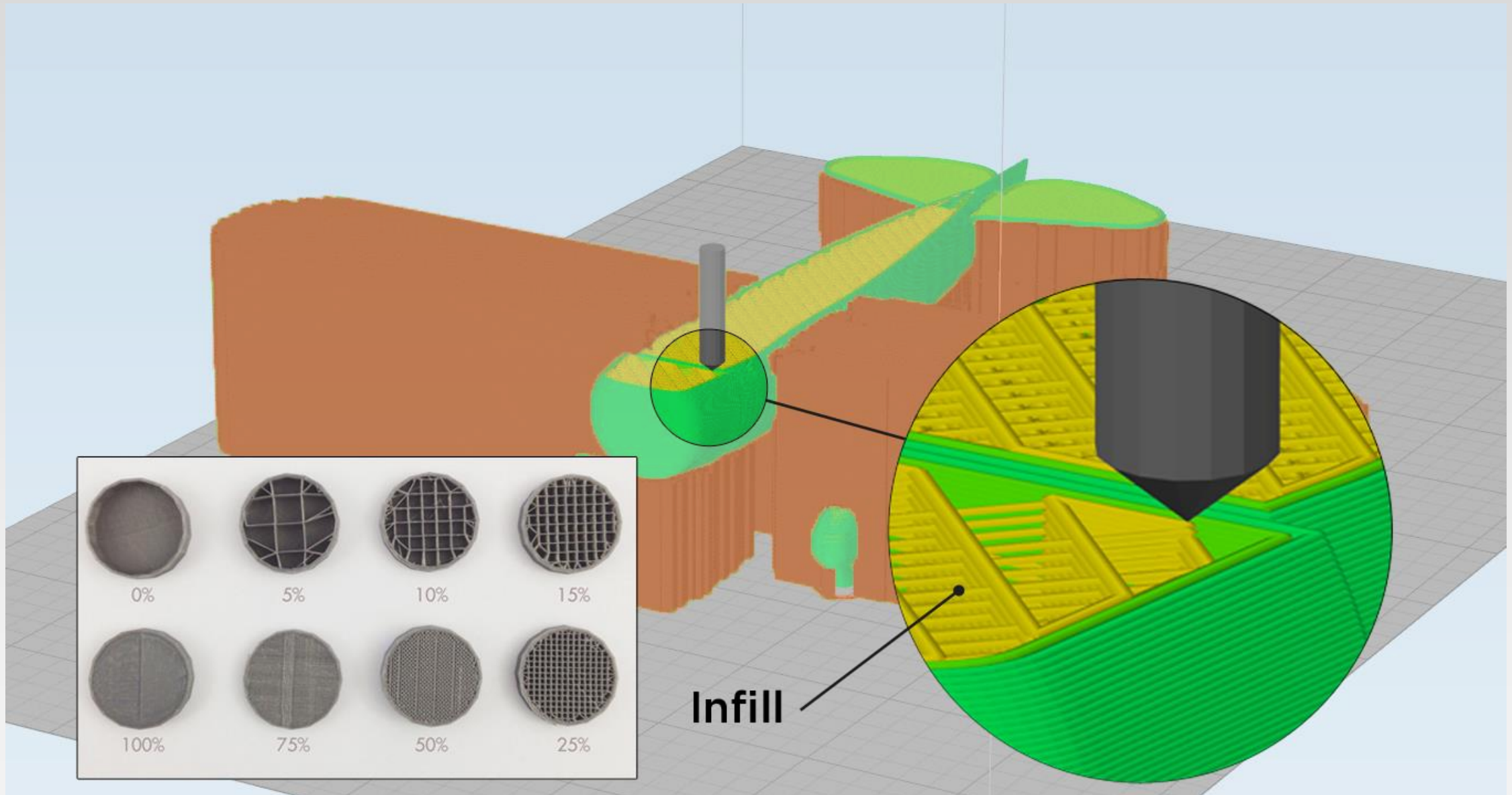
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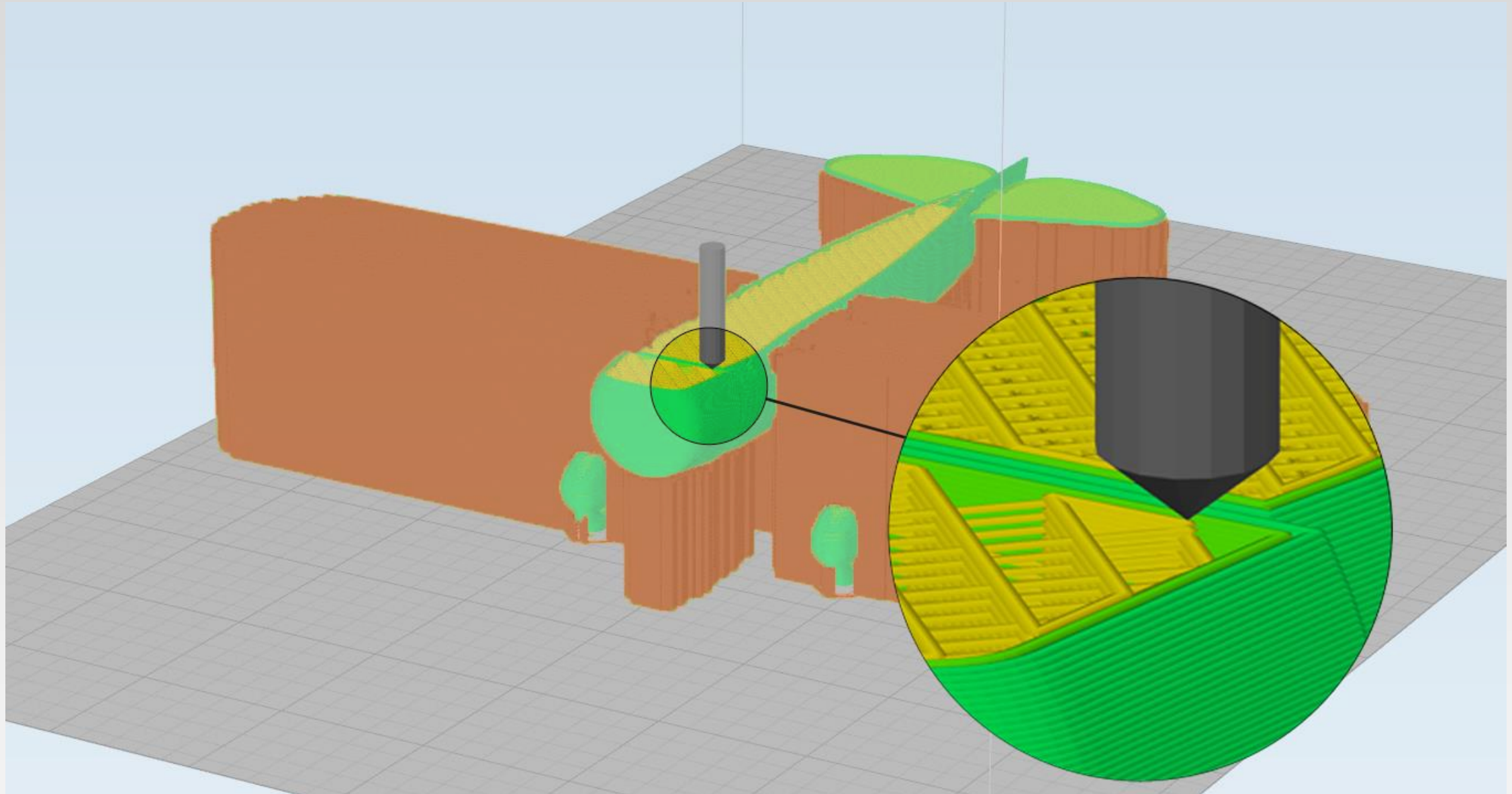
▶ PRINTING WORKFLOW



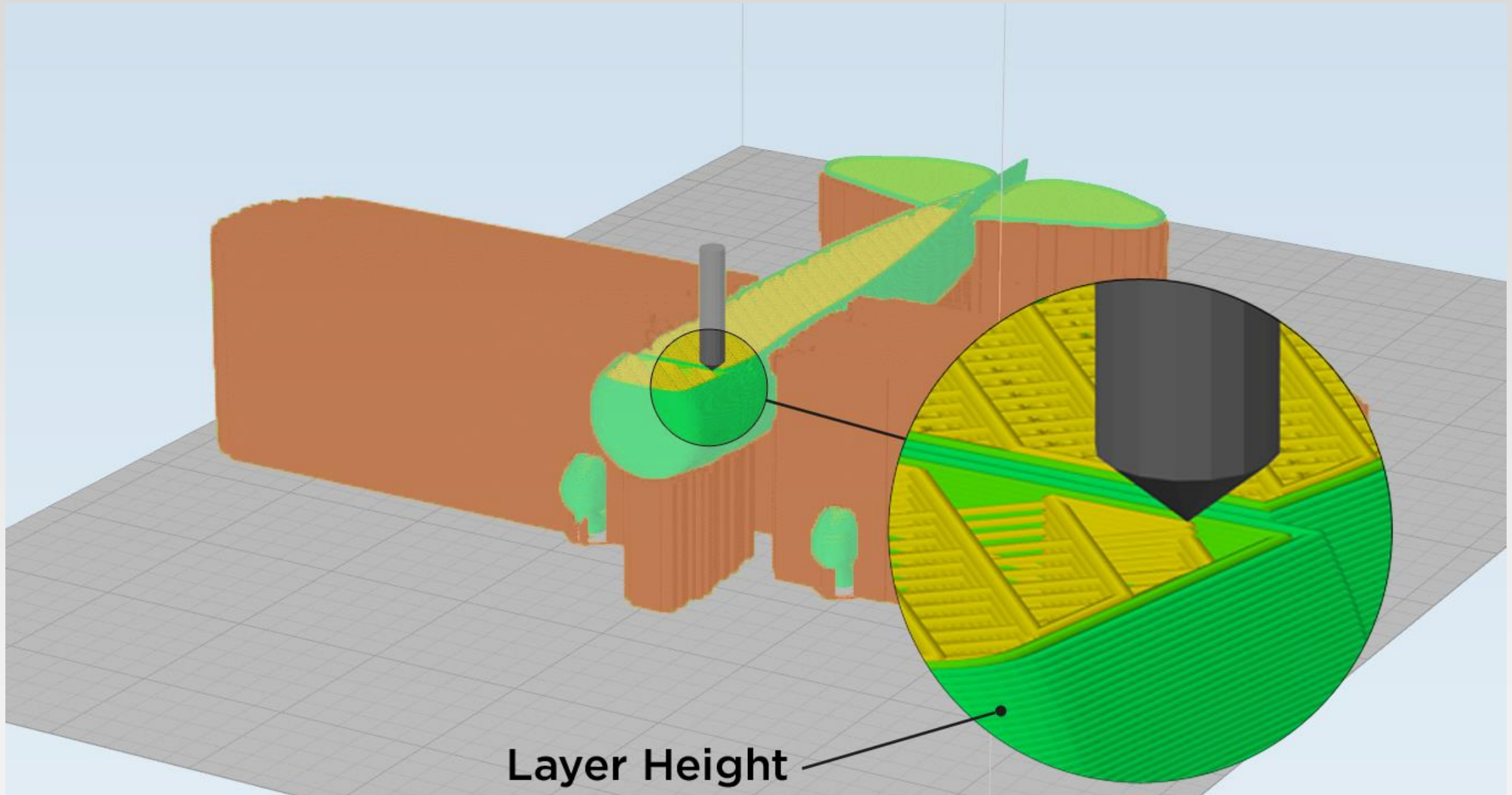
▶ PRINTING WORKFLOW



▶ PRINTING WORKFLOW

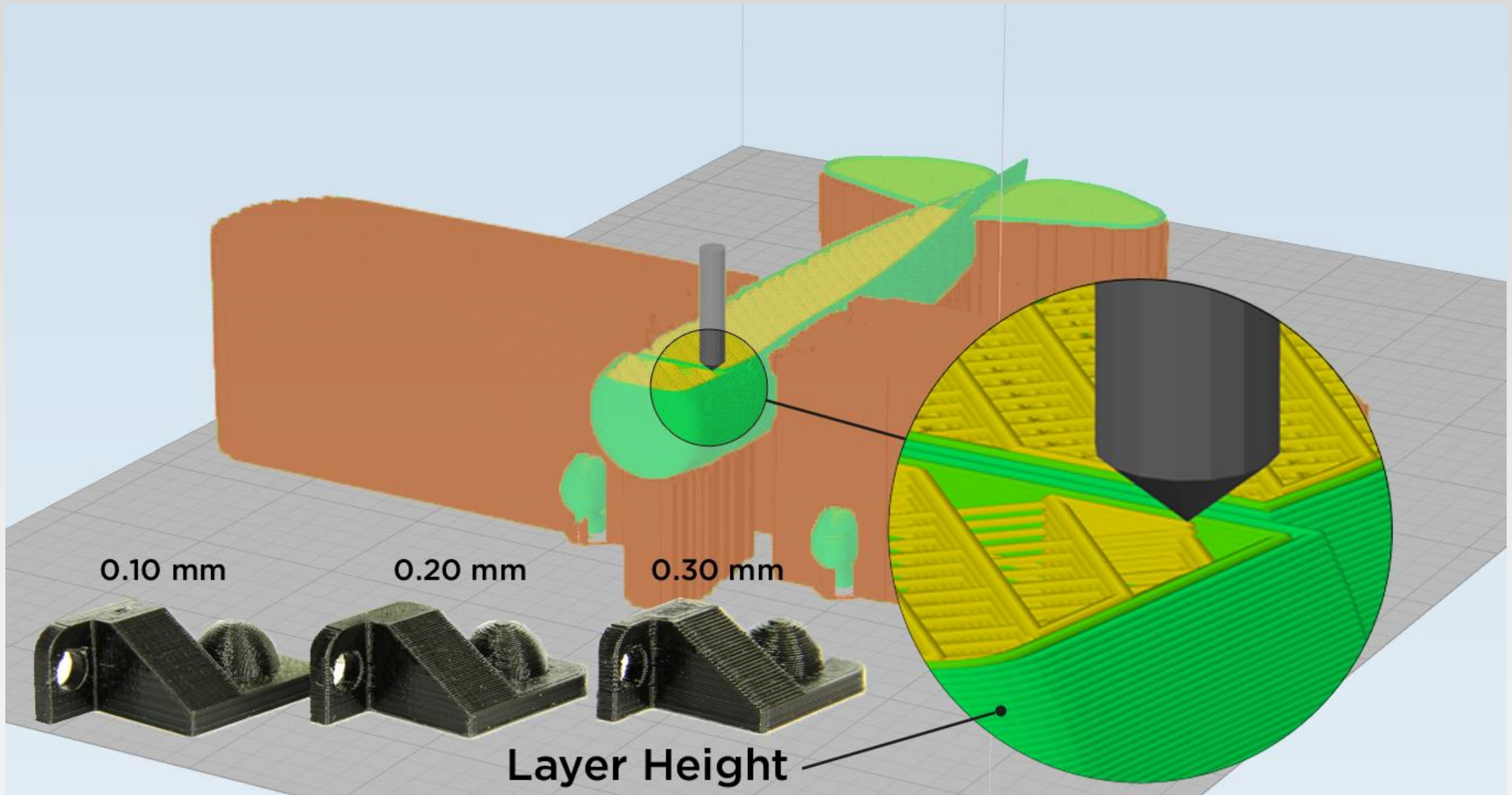


▶ PRINTING WORKFLOW

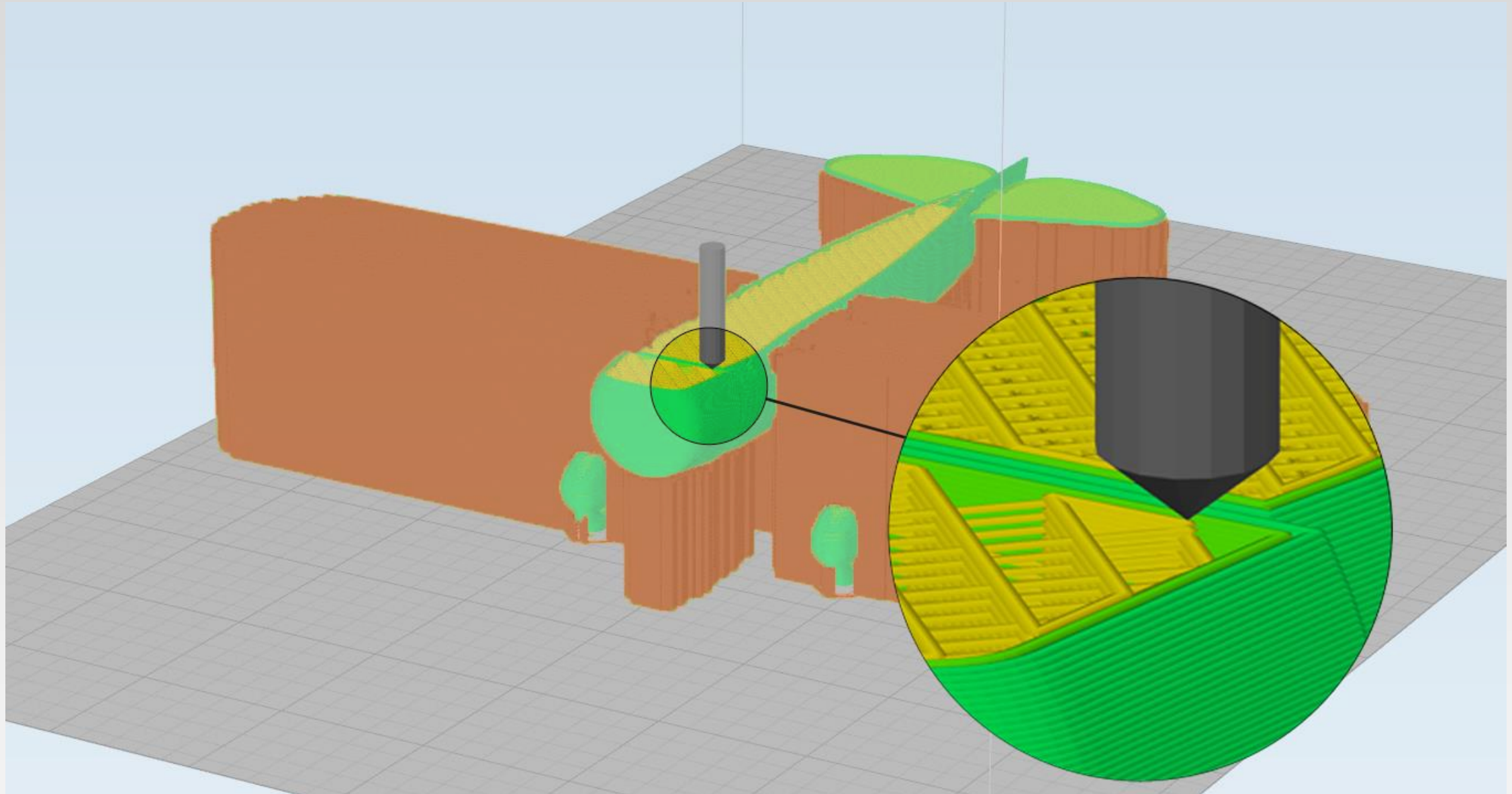


Layer Height

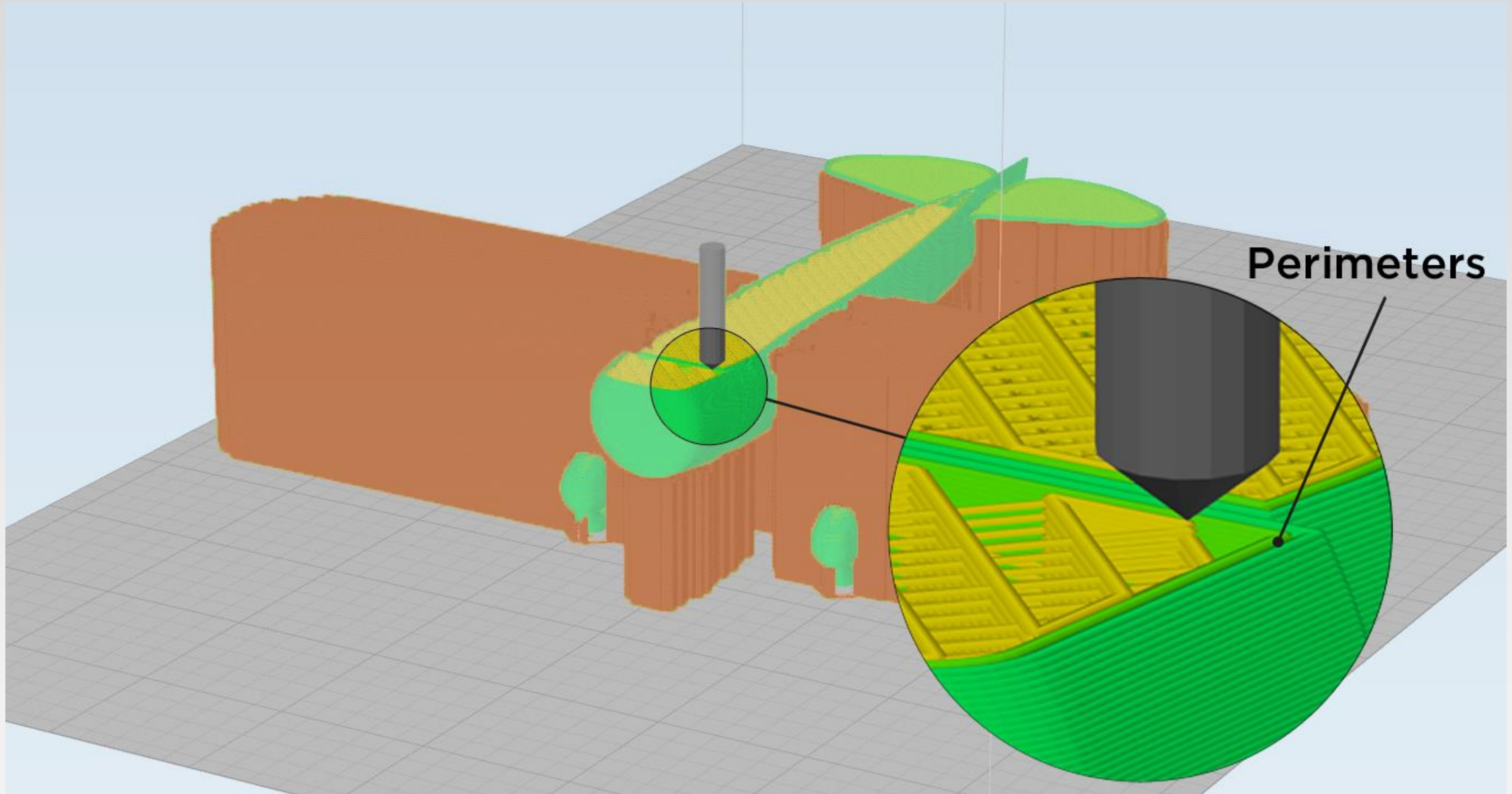
▶ PRINTING WORKFLOW



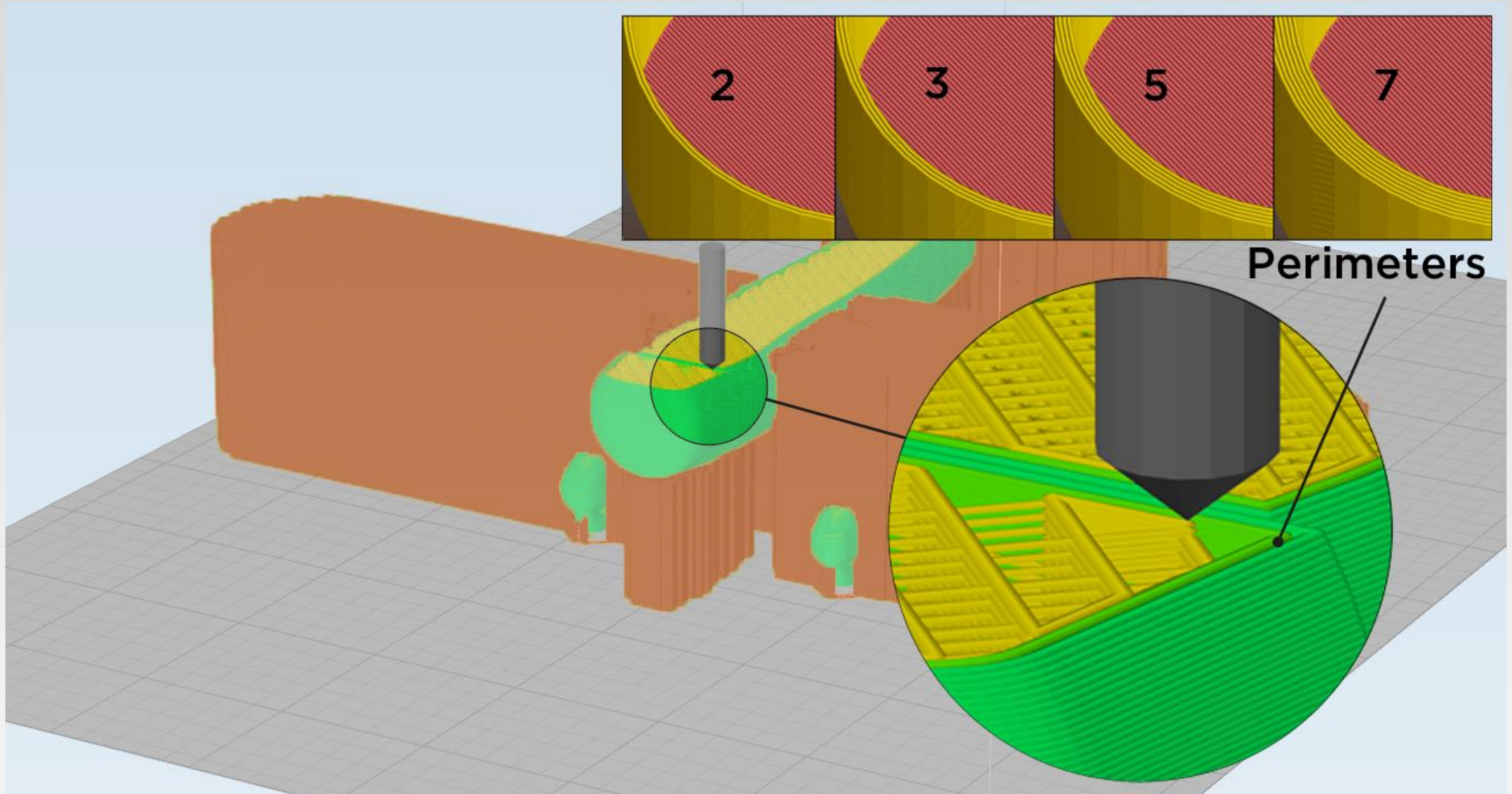
▶ PRINTING WORKFLOW



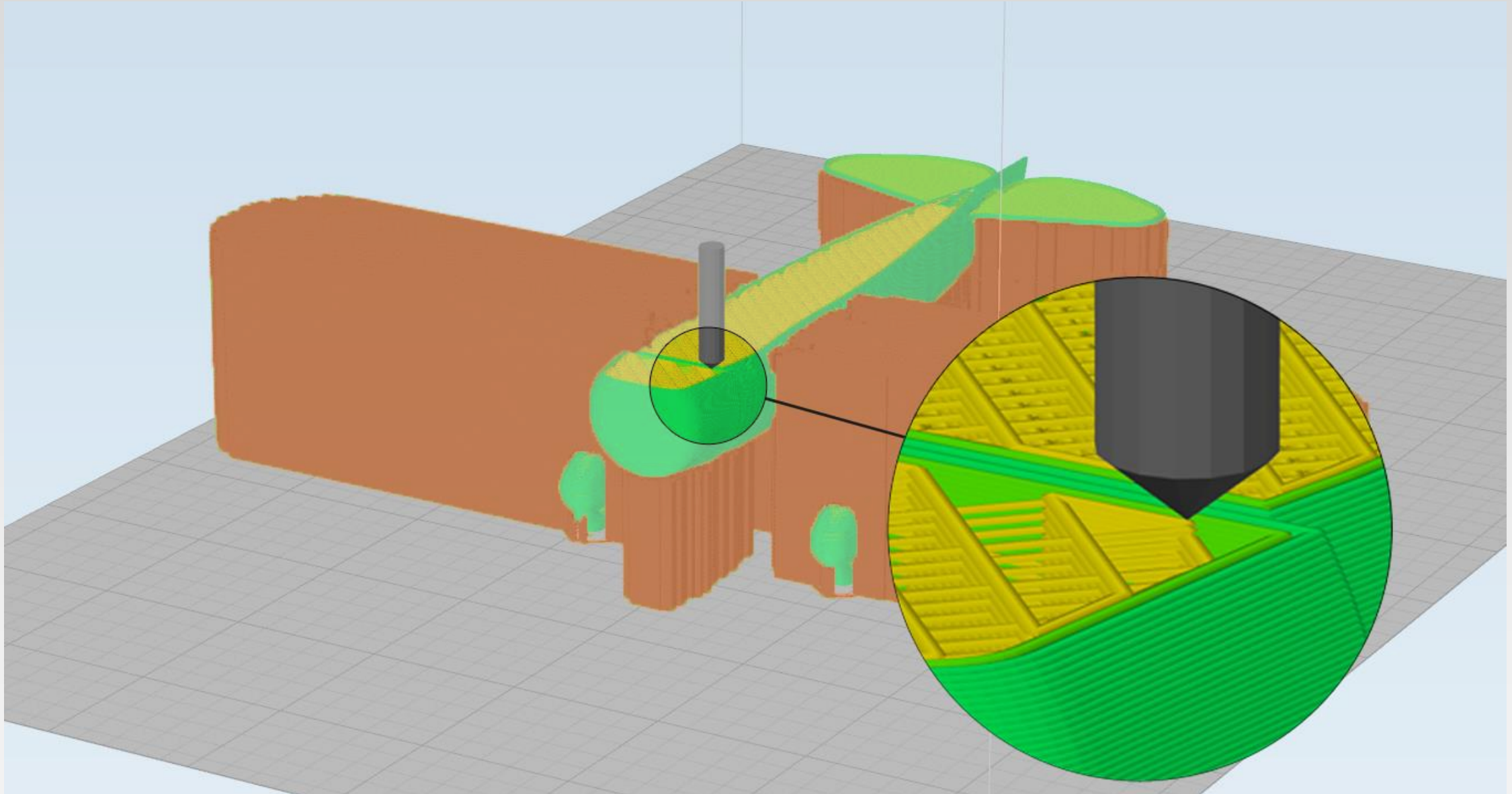
▶ PRINTING WORKFLOW



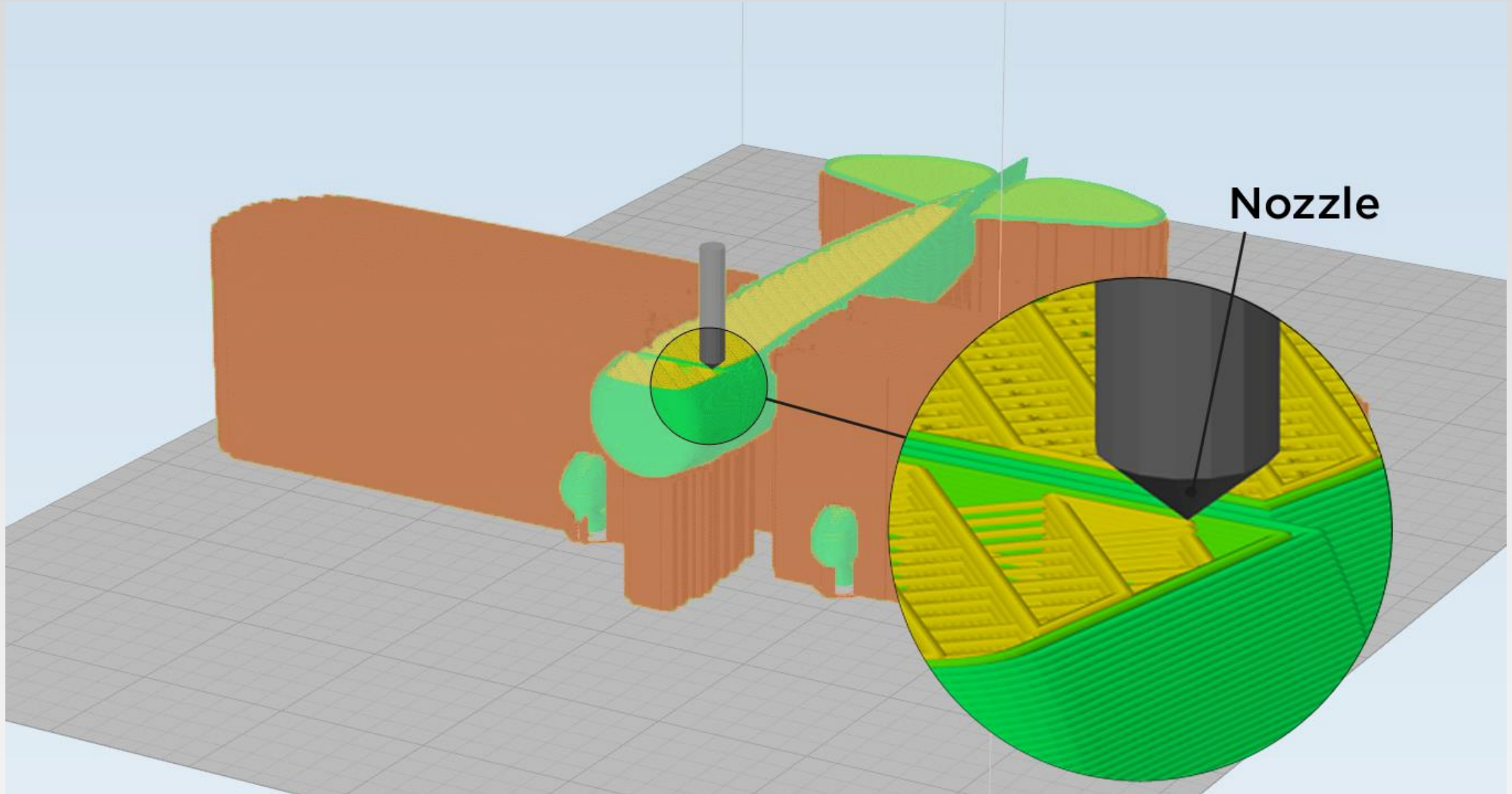
▶ PRINTING WORKFLOW



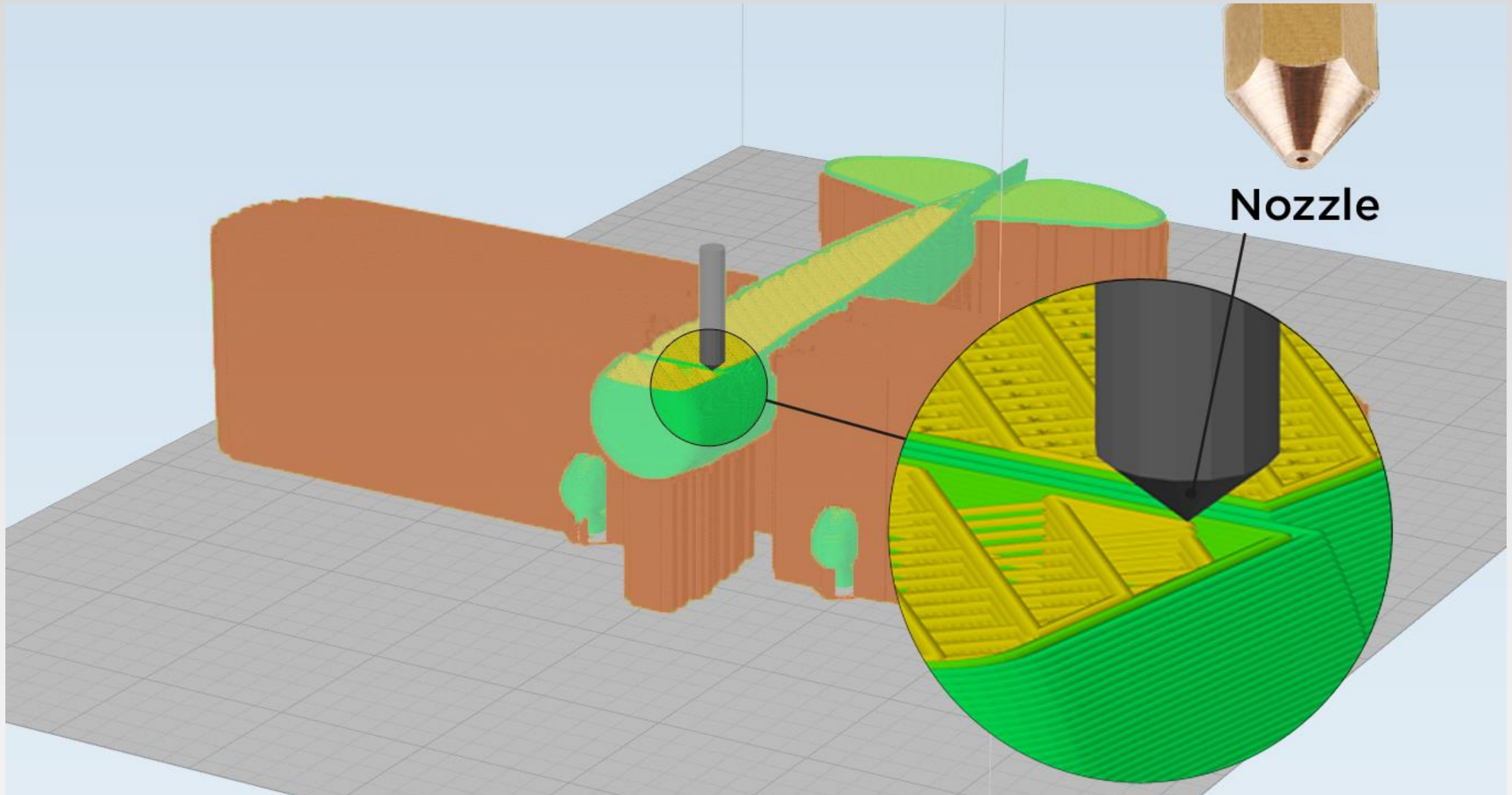
▶ PRINTING WORKFLOW



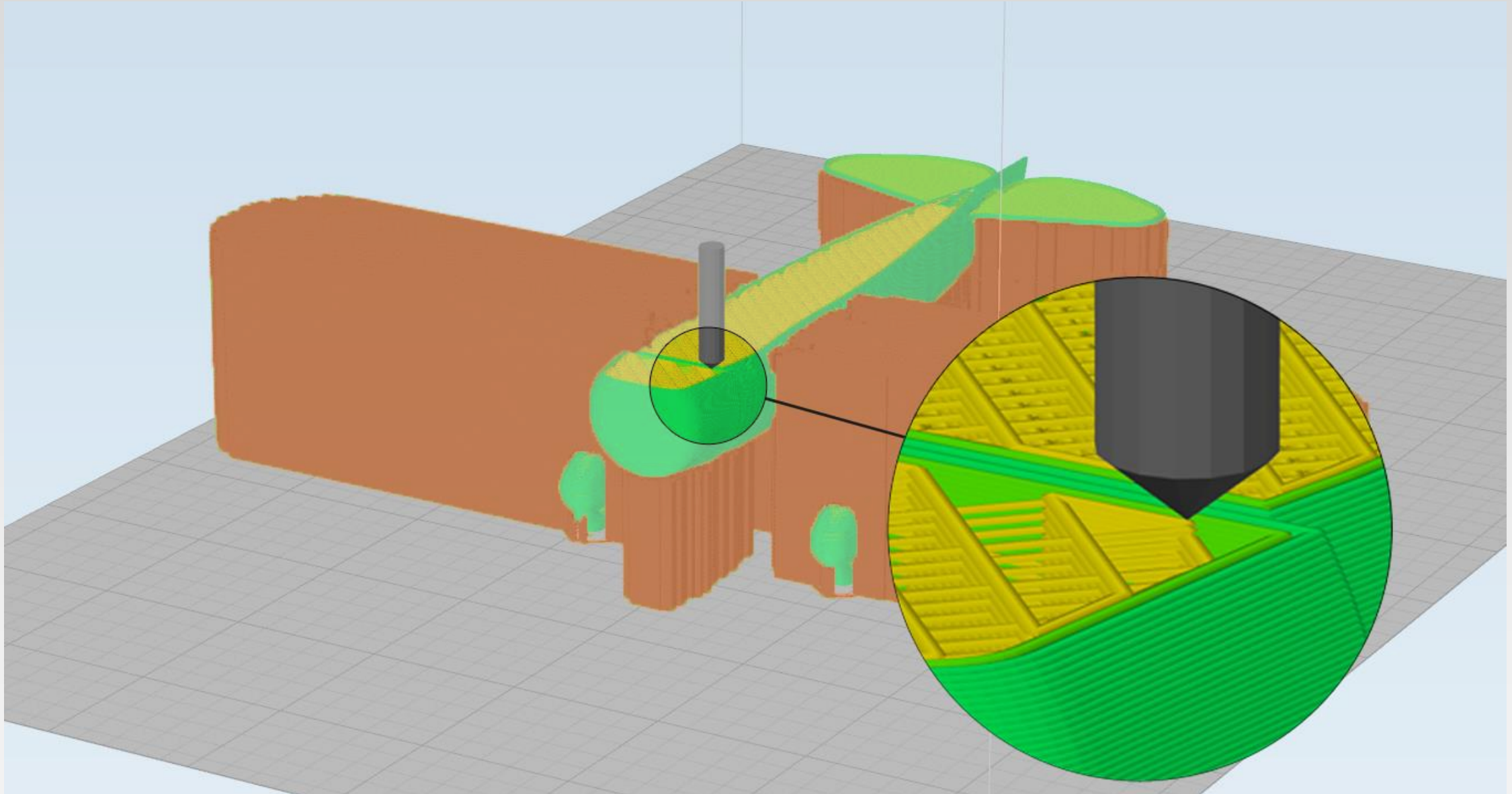
▶ PRINTING WORKFLOW



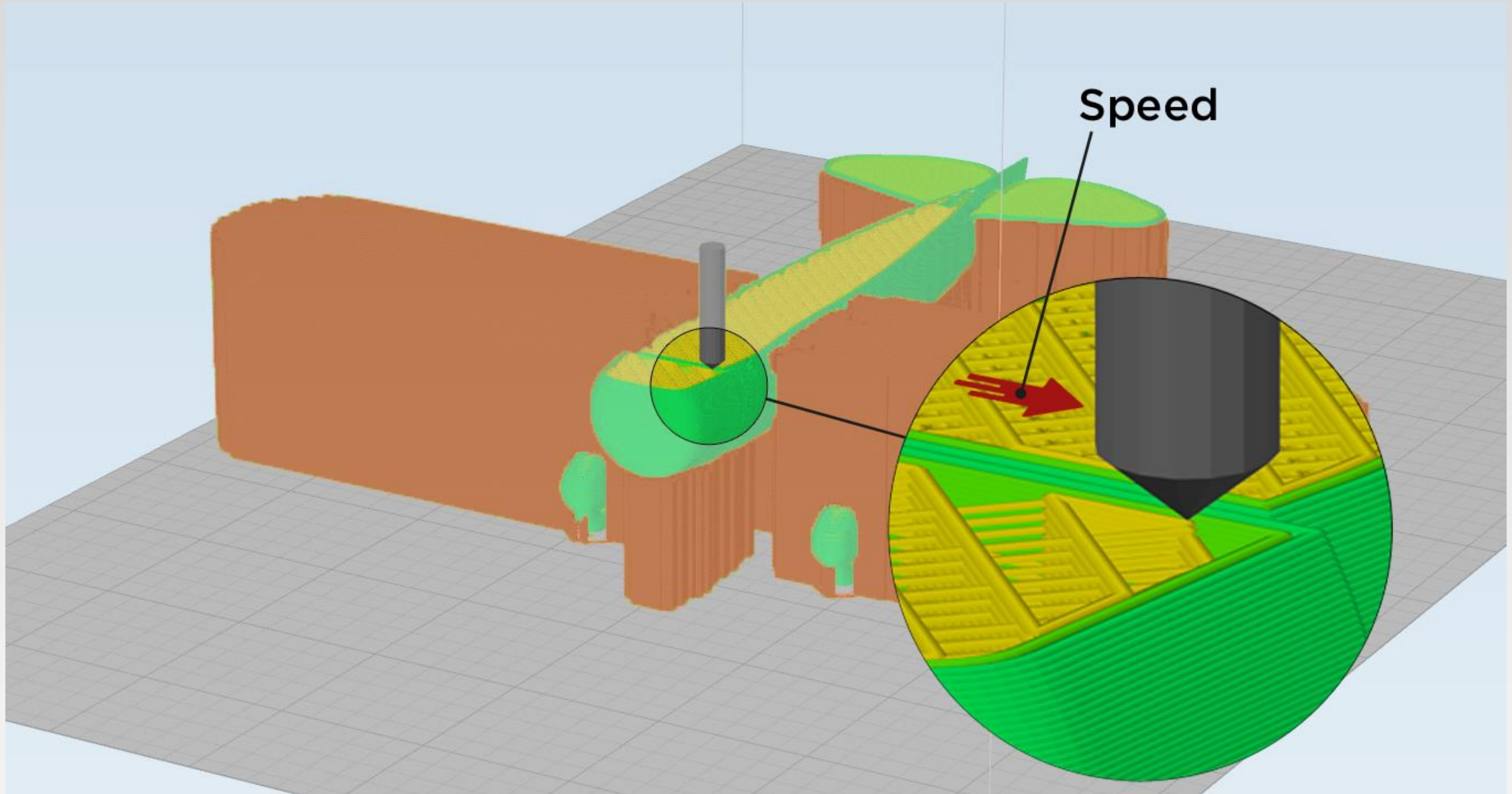
▶ PRINTING WORKFLOW



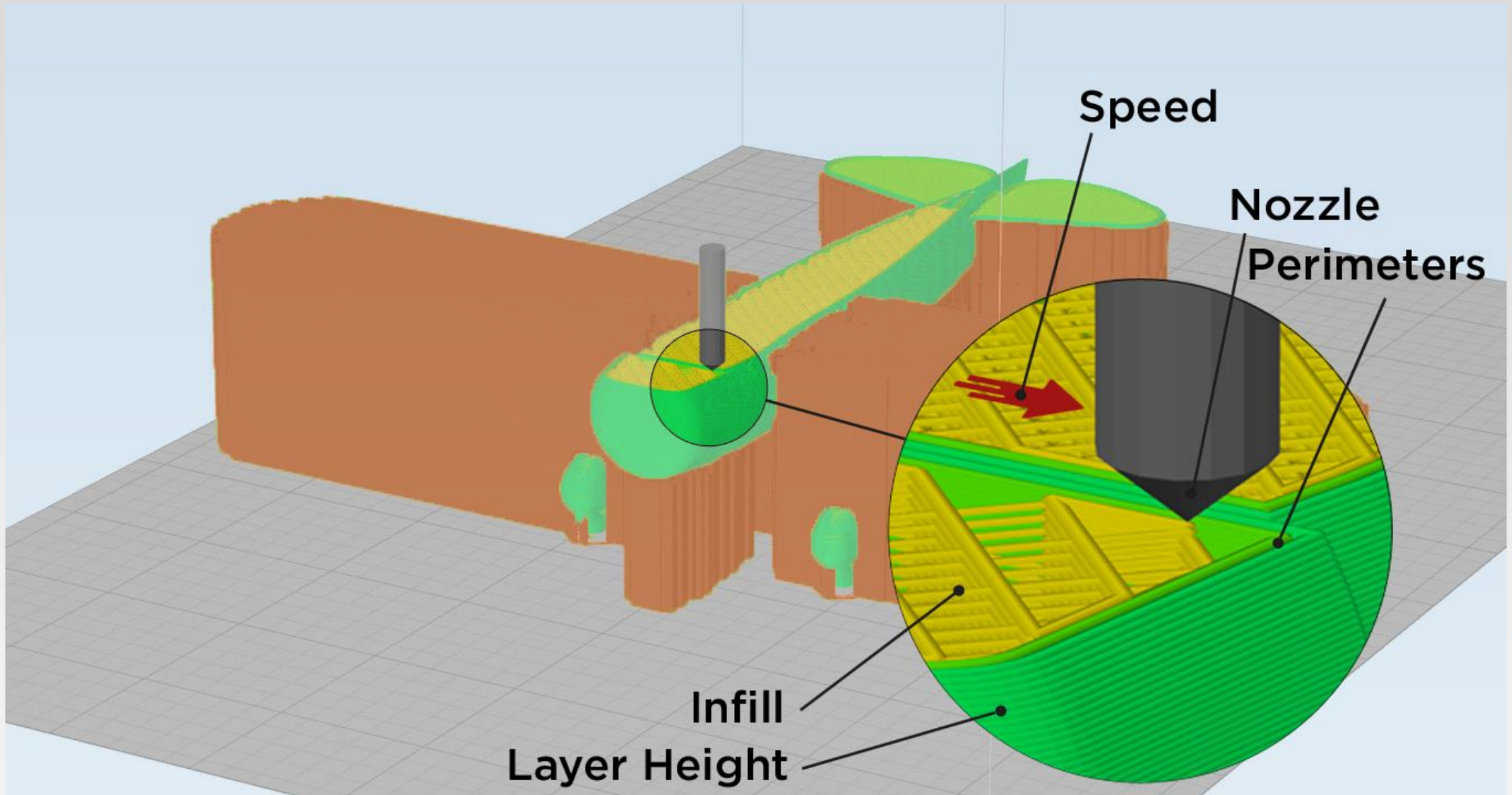
▶ PRINTING WORKFLOW



▶ PRINTING WORKFLOW



▶ PRINTING WORKFLOW



PRINTING WORKFLOW



Cura-BCN3D 0.1.4

File Tools Machine Expert Help

Basic Advanced Plugins Start/End-GCode

Quality

Layer height (mm) 0.2

Shell thickness (mm) 0.8

Enable retraction

Fill

Bottom/Top thickness (mm) 0.8

Fill Density (%) 20

Speed and Temperature

Print speed (mm/s) 40

Printing temperature (C) 200

2nd nozzle temperature (C) 190

Bed temperature (C) 50

Support

Support type Everywhere

Platform adhesion type None

Support dual extrusion Second extruder

Dual extrusion

Wipe&prime tower

Ooze shield

Filament

Diameter (mm) 2.9

Diameter2 (mm) 0

Flow (%) 100

11 hours 37 minutes
4.41 meter 36 gram
13.08 meter 107 gram

The interface displays a 3D view of a printer bed with a black and white checkered pattern. A white rectangular object with the BCN3D logo is positioned on the bed. The logo consists of a blue gear icon, the text 'BCN3D', and a sigma symbol. In the top right corner of the 3D view, there is a small icon of a printer nozzle.

PRINTING WORKFLOW



1 Load

1. Load a 3D model file

11 hours 37 minutes
4.41 meter 36 gram
13.08 meter 107 gram

Open 3D model

Organizar Nueva carpeta

Nombre	Fecha de modifica...	Tipo
airplane	27/02/2016 11:39	Archivo ST

Nombre: avion

All (*.stl;*.obj;*.dae;*.amf;*.bmf)

Abrir Cancelar

PRINTING WORKFLOW



1 **2** Profiles

1. Load a 3D model file
2. Load a profile for the print

11 hours 37 minutes
4.41 meter 36 gram
13.08 meter 107 gram

Nombre	Fecha de modifica...	Tipo
PLA_PVA_HQ_Colorfila_Esun	29/02/2016 8:12	Opciones
PLA_PVA_STD_Colorfila_Esun	29/02/2016 8:12	Opciones
PLA_PVA_STR_Colorfila_Esun	29/02/2016 8:12	Opciones

PRINTING WORKFLOW



1 **2** **3**

1. Load a 3D model file

2. Load a profile for the print

3. Save/Export the Gcode file

11 hours 37 minutes
4.41 meter 36 gram
13.08 meter 107 gram

BCN3D

Cura-BCN3D 0.1.4

File Tools Machine Expert Help

Basic Advanced Plugins Start/End-GCode

Quality

Layer height (mm) 0.2

Shell thickness (mm) 0.8

Enable retraction

Fill

Bottom/Top thickness (mm) 0.8

Fill Density (%) 20

Speed and Temperature

Print speed (mm/s) 40

Printing temperature (C) 200

2nd nozzle temperature (C) 190

Bed temperature (C) 50

Support

Support type Everywhere

Platform adhesion type None

Support dual extrusion Second extruder

Dual extrusion

Wipe&prime tower

Ooze shield

Filament

Diameter (mm) 2.9

Diameter2 (mm) 0

Flow (%) 100

PRINTING WORKFLOW



Cura-BCN3D 0.1.4

File Tools Machine Expert Help

Basic Advanced Plugins Start/End-GCode

Quality

Layer height (mm) 0.2

Shell thickness (mm) 0.8

Enable retraction

Fill

Bottom/Top thickness (mm) 0.8

Fill Density (%) 20

Speed and Temperature

Print speed (mm/s) 40

Printing temperature (C) 200

2nd nozzle temperature (C) 190

Bed temperature (C) 50

Support

Support type Everywhere

Platform adhesion type None

Support dual extrusion Second extruder

Dual extrusion

Wipe&prime tower

Ooze shield

Filament

Diameter (mm) 2.9

Diameter2 (mm) 0

Flow (%) 100

11 hours 37 minutes
4.41 meter 36 gram
13.08 meter 107 gram

Layer height
Perimeters
Infill
Speed

With a 0.4 mm nozzle:
0.4 mm = 1 perimeter.
0.8 mm = 2 perimeters.
1.2 mm = 3 perimeters.
1.6 mm = 4 perimeters.
2 mm = 5 perimeters.
...

BCN3D

▶ PRINTING WORKFLOW



Cura-BCN3D 0.1.4

File Tools Machine Expert Help

Basic Advanced Plugins Start/End-GCode

Machine

Nozzle size (mm)

Retraction

Speed (mm/s)

Distance (mm)

Dual extrusion switch amount (mm)

Quality

Initial layer thickness (mm)

Initial layer line width (%)

Cut off object bottom (mm)

Dual extrusion overlap (mm)

Speed

Travel speed (mm/s)

Bottom layer speed (mm/s)

Infill speed (mm/s)

Top/bottom speed (mm/s)

Outer shell speed (mm/s)

Inner shell speed (mm/s)

Cool

Minimal layer time (sec)

Enable cooling fan

11 hours 37 minutes
4.41 meter 36 gram
13.08 meter 107 gram

Nozzle

BCN3D

▶ PRINTING WORKFLOW



PRINT



MATERIALS

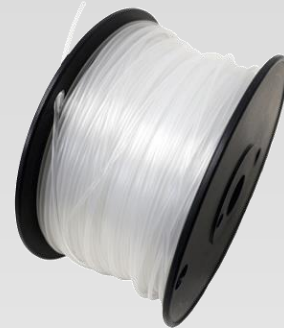
▶ MATERIALS



PLA
Polilactic Acid



ABS



Nylon



Filaflex



PVA

- Woodfill*
- BambooFill*
- BronzeFill*
- Coopperfill*
- Glowfill*
- Policarbonat
- Hips
- ...

*0,6mm Hotend recommended

MATERIALS



●●● HIGH ●●○ MEDIUM ●○○ LOW

	MECHANICAL RESISTANCE	TERMICAL RESISTANCE	POSSIBILITY OF POSTPROCESSING	FLEXIBILITY	COLOR RANGE	PRICE	ALIMENTATION COMPATIBILITY	NOZZLE	PRINTING EASINESS
PLA	●●○	●○○	●○○	●○○	●●●	●○○	●●● (Colorfila)	0.4mm	●●●
ABS	●●●	●●●	●●●	●○○	●●○	●○○	●○○	0.4mm	●●○
FILAFLEX	●●○	●●○	●○○	●●●	●●●	●●○	●○○	0.6mm	●○○
XT COLORFABB	●●●	●●●	●●○	●○○	●●○	●●○	●○○	0.6mm	●●○
COLORFABB SPECIALS	●○○	●○○	●●●	●○○	●○○	●●●	●○○	0.6mm	●○○
NYLON	●●●	●●●	●●○	●●○	●○○	●●○	●○○	0.4mm	●●○



PLA

- Best material for 3D printing.
- Suitable for the printing requirements of the majority of applications.
- Wide range of colours.
- The finish is slightly glossy or semi-matte.
- When printing the operating temperature oscillates from 195° C to 220° C.
- Printing overhangs is easier if a layer fan is used.
- Very high adhesion to the printing surface.
- Average mechanical properties.
- At operating temperatures of 50° C or more, the mechanical properties and rigidity of the objects may decrease.



ABS (new generation ABS rTitan)

- Printing with ABS is more complex, and requires a certain amount of care: it is not recommended for non-experienced users.
- Wide range of colours.
- The finish is mate or semi-matte.
- When printing the operating temperature oscillates from 250° C.
- Depending on the supplier and the printing speed. ABS performs better with overhangs than PLA and needs less air from the layer fan (too much air is usually harmful).
- Its base does not adhere to the surface as well as those of PLA objects, as it contracts when cooling down, which means it usually requires an adhesive lacquer even when the temperature of the printing surface is 85° C.
- It has higher mechanical properties than PLA, and is more stable at high temperatures.
- If the object has a very large base, the adhesion problems become worse, in particular with the edges of the object.
- DIMAFIX for better adhesion.

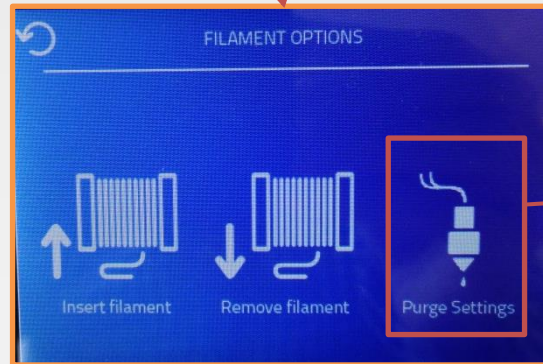
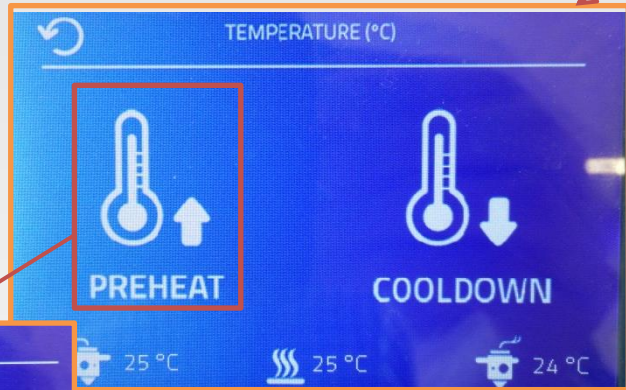
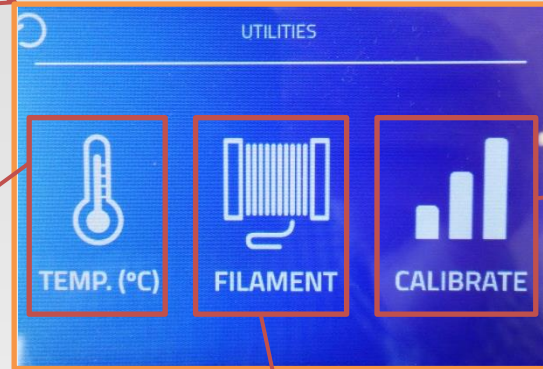


PVA or BVOH (BVOH is new generation)

- Its used to print support structures for overhangs.
- White colour.
- Its soluble in water, which means it can be removed easily and safely
- When printing the operating temperature oscillates from 230° C or as in filament box.
- Problems may occur when printing the supports due to oozing issues.
- The material is highly sensitive to ambient moisture, and must be removed from the printer after use and stored in a dry place.

OPERATION TIPS

▶ OPERATION TIPS



BASIC MAINTENANCE

▶ BASIC MAINTENANCE



MODULE	PROCEDURE TO BE PERFORMED	REGULARITY
GENERAL	Keep the printer free of dust and in a cool, dry place.	Daily
	Store the spools in a cool, dry place when not in use.	Daily
	Remove the filament from the purge chambers.	Daily
	Check all the nuts and screws are tight.	Monthly
PRINTING PLATFORM	Clean the printing surface.	Weekly
	Calibrate the heating bed with the help of the Calibration Assistant.	Weekly
HOT-ENDS	Clean the nozzles of the hot-ends.	Daily
	Make sure there is no dust in the fans.	Weekly
	Check the fans are working properly.	Weekly
	Calibrate the height of the hot-ends with the help of the Calibration Assistant.	Every 2 weeks
	Check the fastening of the extruder mechanism's compression spring *.	Monthly
X AND Y AXES	Check that the extruders can move freely in the X/Y axes when the printer is switched off.	Weekly
	Check the tension of the belts of the X/Y axes*.	Every 6 months
	Make sure the filament is not obstructing the axes of the motors.	Daily
Z AXIS	Clean and grease the lead screw *.	Monthly
	Clean and grease the Z-axis shaft-guides.	Monthly
FIRMWARE SOFTWARE ELECTRONICS	Check whether there is a new software /firmware version available at https://github.com/BCN3D	Every 2 weeks
	Re-establish potentiometers' levels*.	Every 6 months
	Check the cable connections of the axes while they are moving.	Every 6 months

*Explained in the user manual



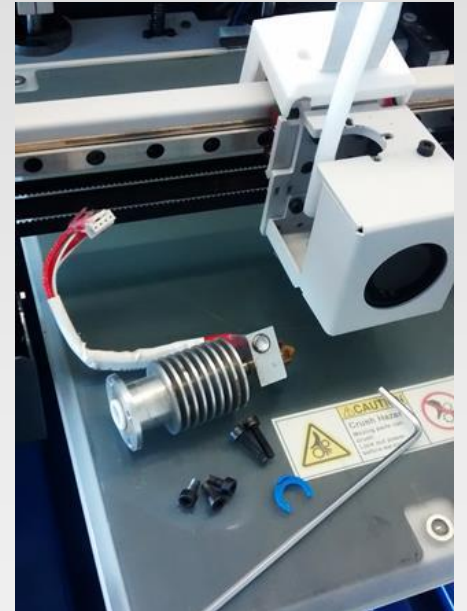
CHANGING THE HOTEND

We recommend using different hotend for different materials:

- Filaflex with 0.6 mm Nozzle
- exotic materials and composites (laywoo, colorfabb, etc) with 0.6 mm nozzle
- for ABS

Operation steps:

- 1- Remove the Bowden tube
- 2- Remove the Cover Connection
- 3- Disconnect Hotend and replace it with the new
- 4- Assemble the Cover Connection
- 5- Assemble the Bowden tube
- 5- Full Calibration



▶ BASIC MAINTENANCE



BROKEN FILAMENT INSIDE THE BOWDEN TUBE





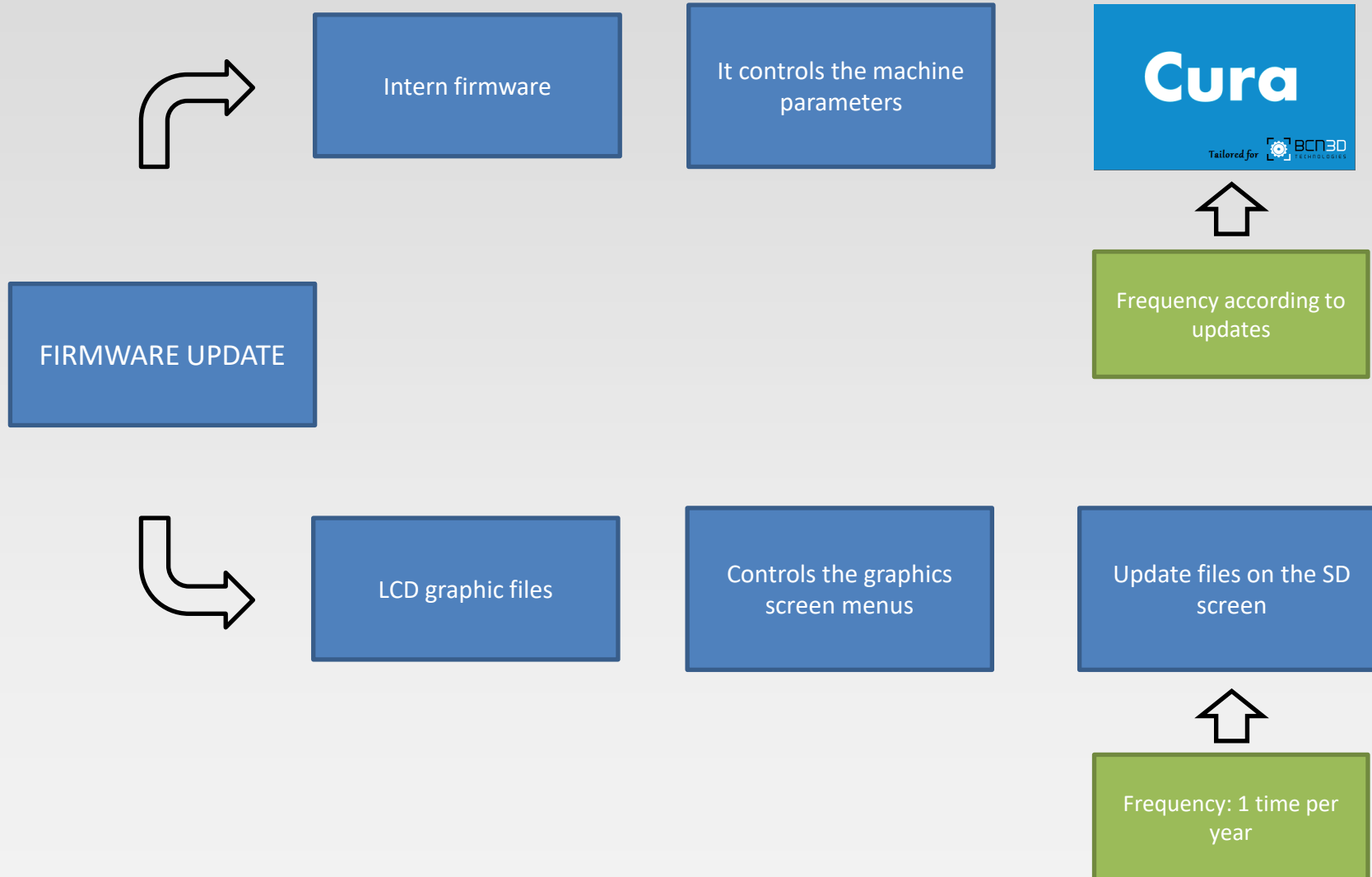
CLEAN THE HOTEND



▶ BASIC MAINTENANCE



UPDATING FIRMWARE





UPDATING FIRMWARE



Firmware
version

ADDITIONAL INFORMATION

▶ ADDITIONAL INFORMATION



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Print the benefits with your BCN3D Sigma:

- <https://www.3dhubs.com/> → Manual: <https://www.bcn3dtechnologies.com/en/content/print-benefits-your-bcn3d>

Other Information:

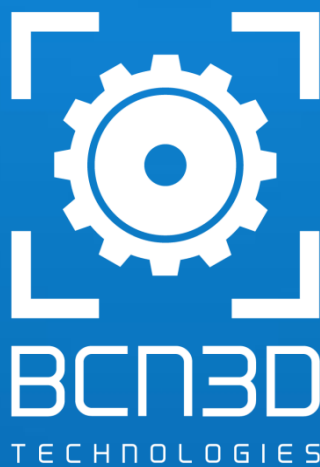
- <http://www.meshmixer.com/>
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▶ ADDITIONAL INFORMATION



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