U3DP

Online Printing Manual

1. **Prepare 3D CAD Model**

    CAD software, 3D scanning or download from Online website

2. **Prepare the *Plate Sliced file* (.3mf format)**

    Prepare a slicing file on Bambu Studio Software

3. **Submit .3mf file**

    Submit the .3mf file at U3DP or online
    https://u3dp.polyu.edu.hk/eBooking/eBookingIndex.php

4. **Complete printing & Receive email with payment notifications**

    Receive email with payment notifications for settling the payment

5. **Settle Payment**

   Settle the payment at Finance Office's Cashier Counter (located at VA205)

6. **Present or upload receipt to collect printing parts**

   Collect the printing parts at W501, U3DP and remove the part support if necessary

1. Prepare 3D CAD Model

3D CAD model can normally be achieved by:

1. CAD software, i.e. Solidworks, Tinkercad, Rhino, etc.

2. 3D scanning (*You may seek for 3D scanning support from IC at Room W503c)

3. Download from On-line sites, i.e. GrabCad Community Library, Thingiverse, Yeggi, Pinshape, etc.
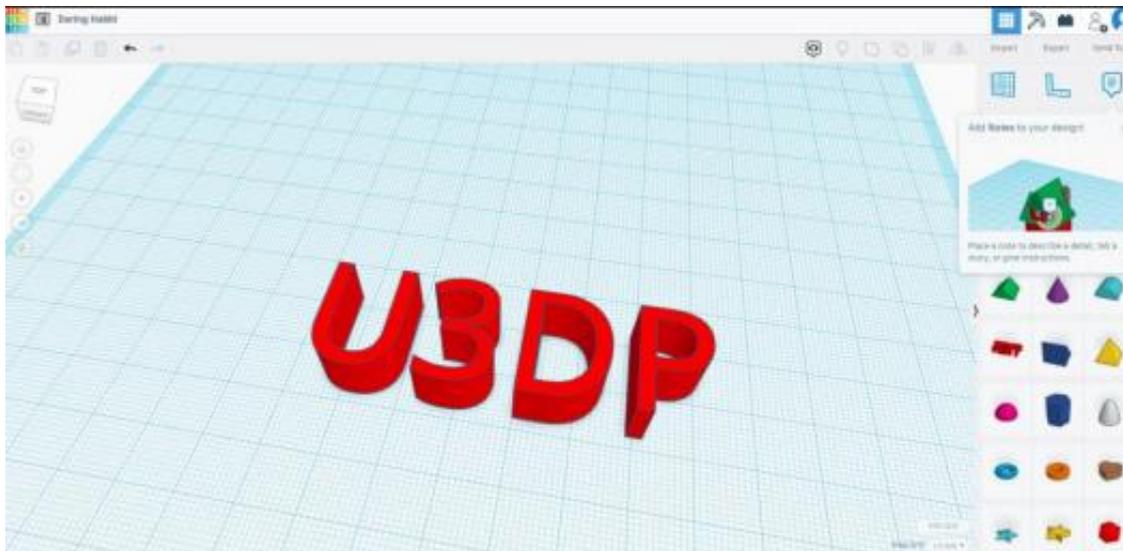
Tinkercad
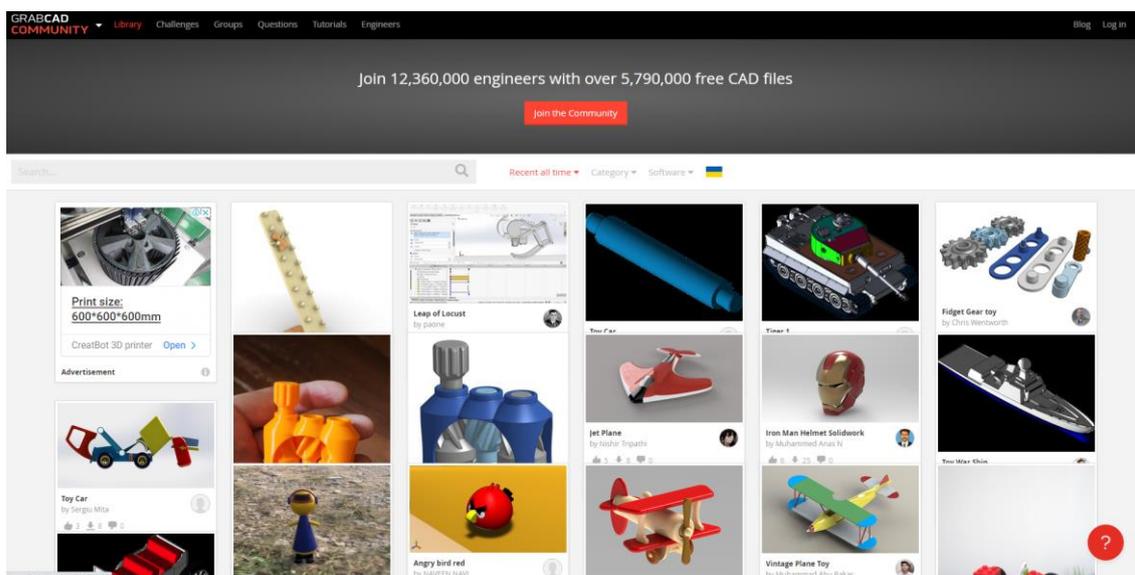
GrabCAD Community Library

2. Prepare the Plate Sliced file

You need to download Bambu Studio via below link.

https://bambulab.com/en/download

The steps for preparing the slicing basically include:

A. Select type of Printer:
   Bambu Lab X1 Carbon 0.4 Nozzle & & *Cool Plate / PLA Plate*

B. Import model: 3mf / stl / stp / step / svg / amf / svg / obj format file
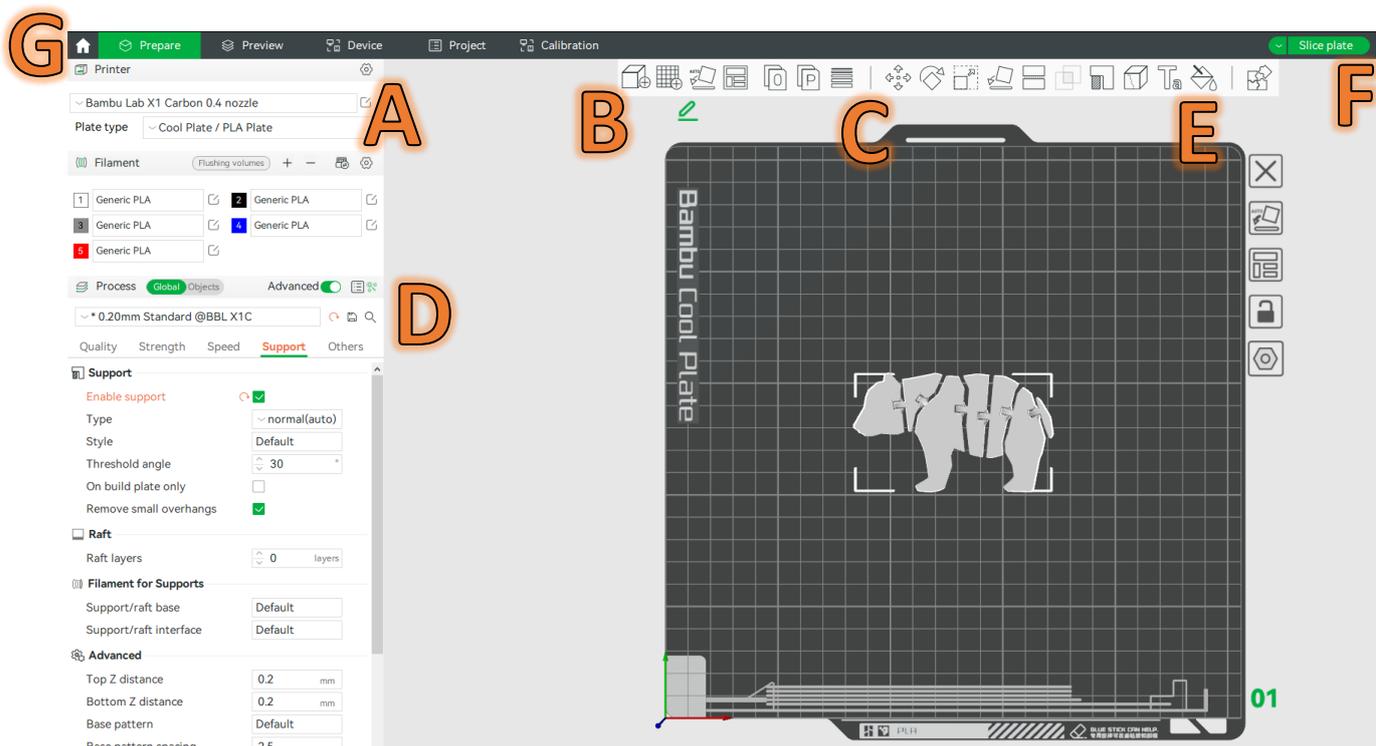
C. Model placement (i.e. how to place your part on the platform)

D. Print Setting (Apply SUPPORT on model with overhang position)

E. Model Colors Painting

F. Slice and Preview

G. Export the plate sliced file

A. Select Type of Printer

Bambu Lab X1 Carbon

Print Technology: FDM, Fused Deposition Modelling

Build Plate: Cool Plate / PLA Plate

Build Volume: 256 x 256 x 256 mm^3

Layer Resolution: 0.2 mm

Material Diameter: 1.75 mm

Material: PLA

B. Import Model

Import a Model to Your Virtual Build Plate

You can import a model to your build plate in a few ways. You can drag files on the build plate or go to Import > File or Folder.

Supported File Types : *3mf / stl / stp / step / svg / amf / svg / obj*

C. Model Placement

Orientation

Select **Auto Orient** to automatically re-orient a selected model to use the least amount of support material

Select **Lay on Face** to rotates model to align selected face to build plate

Select **Rotate** to rotate your model by 45 degrees or by a specific number of degrees along the x-, y-, or z-axis

Scale

Select **scale** to adjust the scale of your model by entering the percentage or the actual size you wanted.

-Select Uniform Scaling to adjust the scale of your model equally along the x-, y-, or z-axis.

-De-select Uniform Scaling to scale the model by a specific amount along the x-, y-, or z-axis.
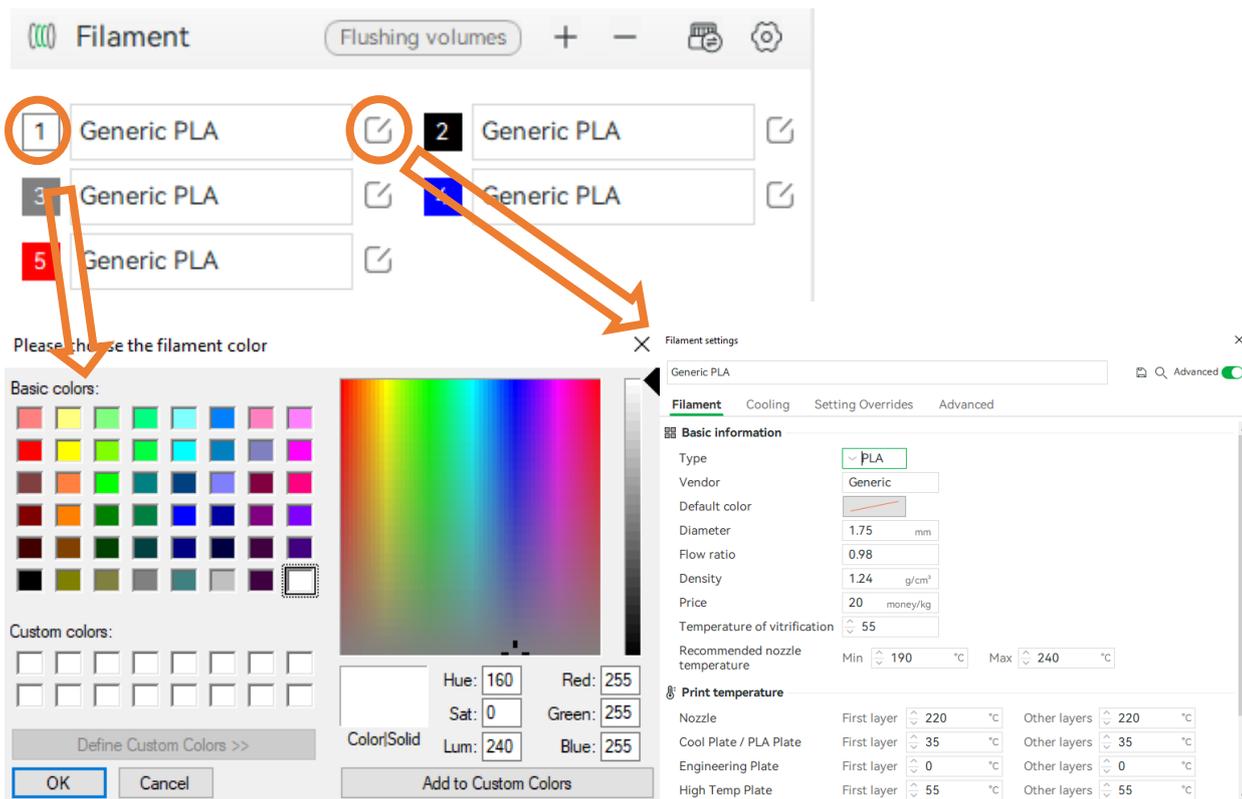
Move

Select **Arrange All Objects** to automatically arrange objects on selected plate

Select **Move** to manually move the objects by x-, y-, or z-axis

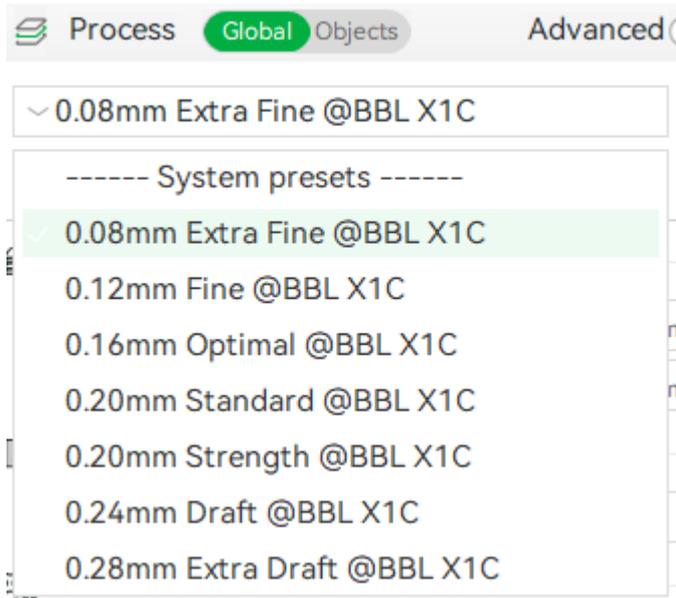# D. Print Setting

Material Setting

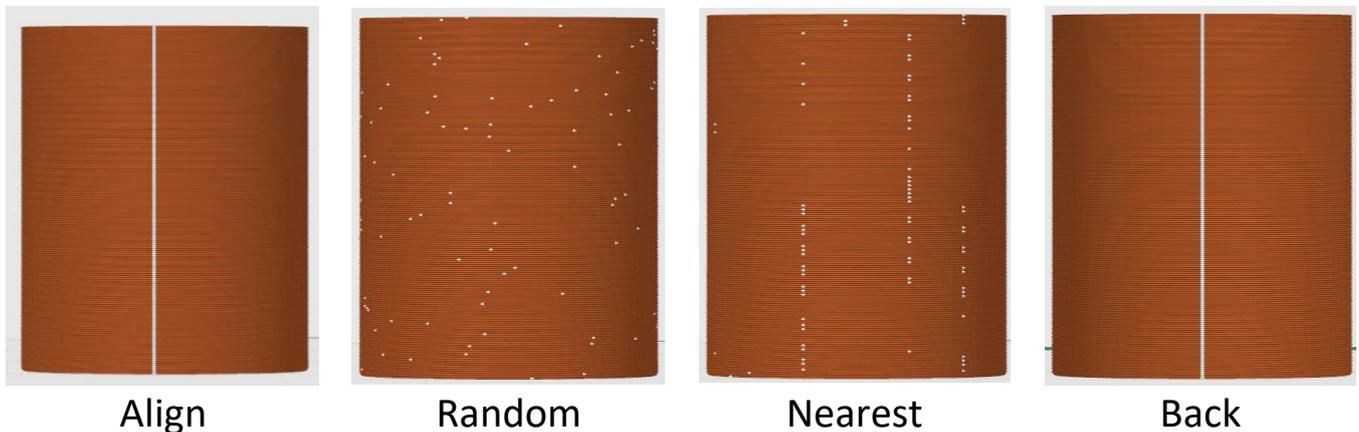Select the filament material and colours

Default Material : PLA

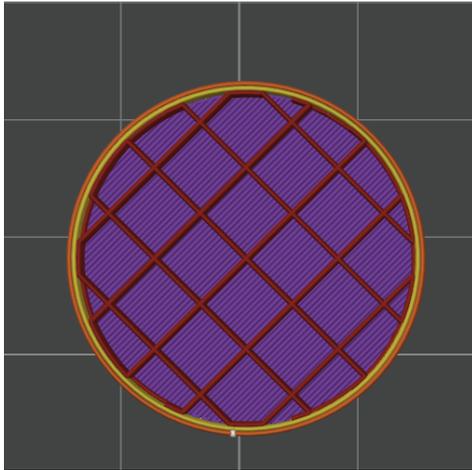Default colour : White / Black / Grey / Blue / Red

Printing Parameter

There are total 7 default setting according to the levels of durable

Default Setting : *0.20mm Standard @BBL X1C*

Seam Position

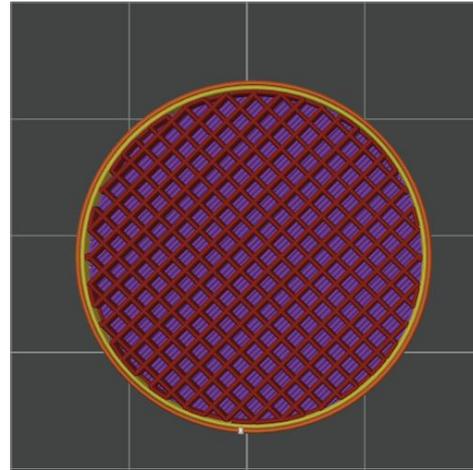| Align | Random | Nearest | Back |

Seam will be visible if your part without any sharp corner, there are four types of seam position of the model
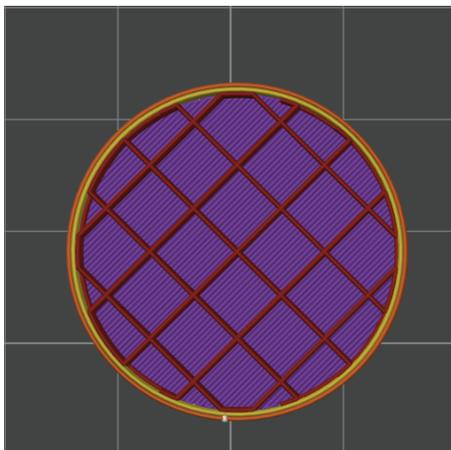
Sparse Infill Density

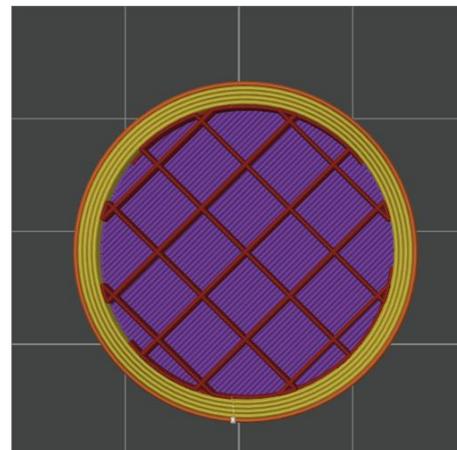15 % Infill   50 % Infill

Infill Density: Adjusts the density of the infill on the inside of the print. If the top of the model is collapsing during a print or the model feels too brittle, increasing the infill density may help. Increasing the density will increase print time.

Default setting: 15%
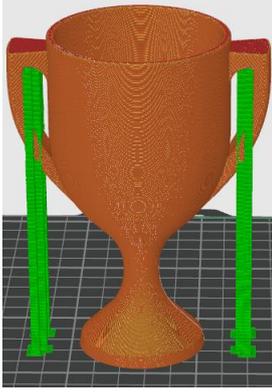
Number of Wall loops

2 Wall loops   5 Wall loops
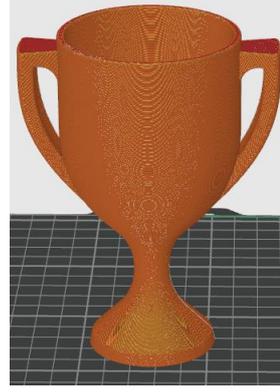
Number of Loops: The number of outermost layers of the printer model. Increasing the number of loops creates thicker stronger walls, but slower prints.

Default setting: 2

Support

With Support

Without Support

Support: Select the Supports checkbox to have your model print with support structures. Bambu Studio will automatically generate supports for any overhanging sections of your object. Supports will be easily removable once you remove your finished object from the build plate.

There are 2 basic types of support: Normal and Tree

Normal support **:**   Directly projects the overhangs down to the heat bed, and gets the support body

Tree support **:**   Sampling the overhangs to get nodes, each node is represented as a circle. And then the nodes are propagated down to the heat bed. During propagation, the circles may be enlarged to get better strength and may be moved away from the object so the supports are less likely to collide with the object
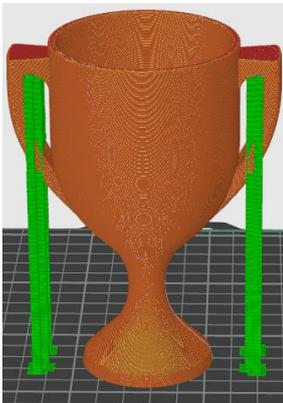
Normal
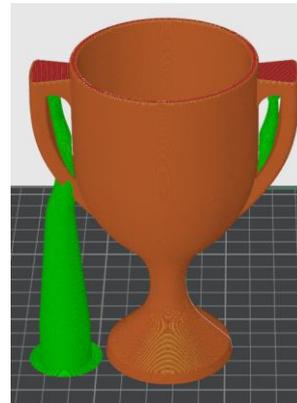
Tree

E. Model Colors Painting

6 painting tool types are provided :
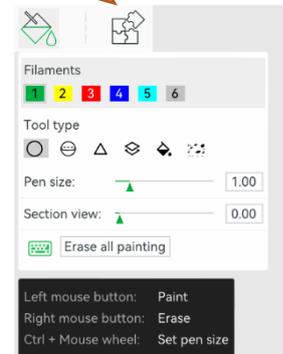
| Circle	Sphere	Triangle	Height Range	Fill	Gap Fill

Circle:	Circle tool is a circle-shape pen tool that is used to draw any curves on the model's surface

Sphere:	The sphere is similar to Circle, but it will colorize all facets inside the sphere rather than only the visible facets

Triangle:	The triangle tool colorizes the triangle pointed by the mouse pointer. Click to colorize a single triangle facet and drag to select a list of triangle facets.

Height Range:	The height range tool colorizes all facets between a given height range, even though they may lay in disjointed regions

Fill:	The Fill Tool colorizes a bucket of connected facets propagated from the facet pointed by the mouse pointer. The propagation stops when reaching a facet that has a different colour. If "Edge detection" is on, the propagation will also be stopped when reaching a corner that is sharper than the threshold.

Gap Fill:	Painting with the above tools often generates gap areas. They may look ugly and increase (expensive) filament changes. The gap fill tool will detect small gaps and auto-fill them with the colour from a neighbour facet group.

The **Pen Size** and **Section View** Function might help you finish the painting effectively.

Choose **Maximum 2 Colours** out of 5 total colours (White / Black / Grey / Blue / Red) in a single print.
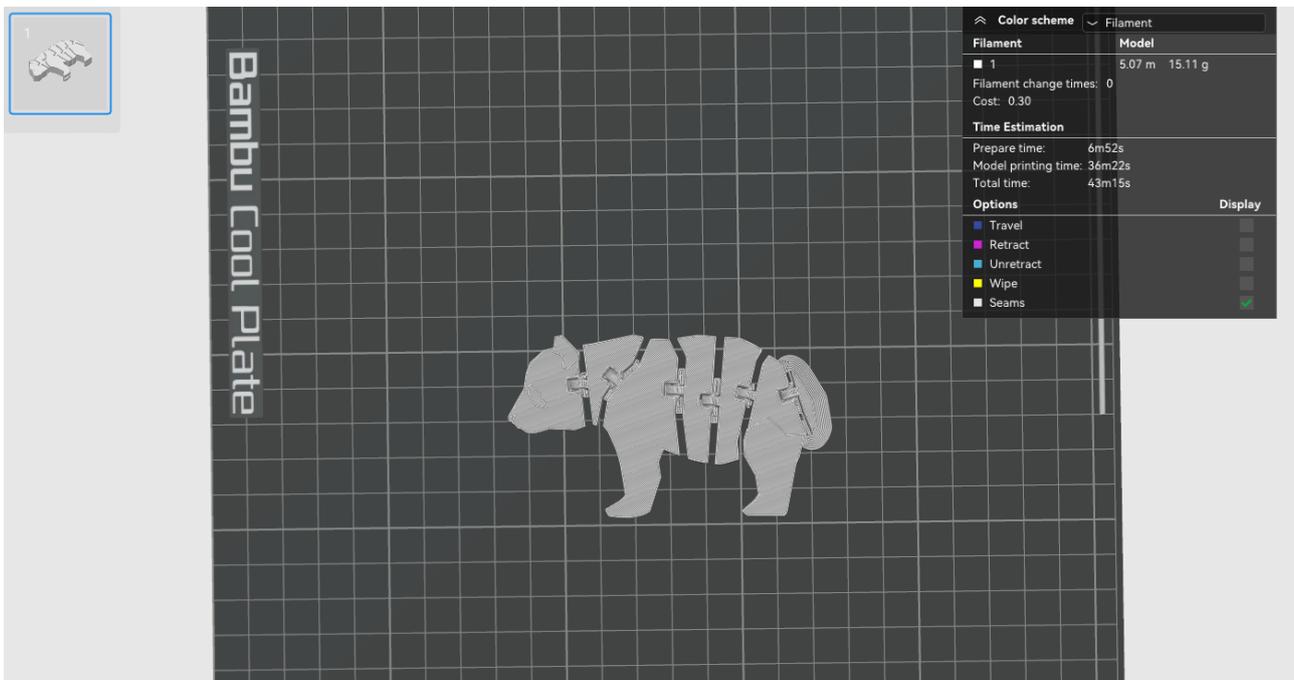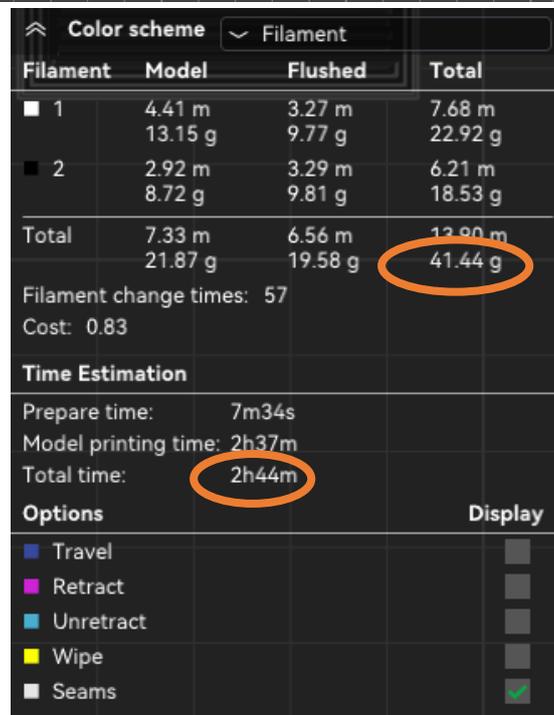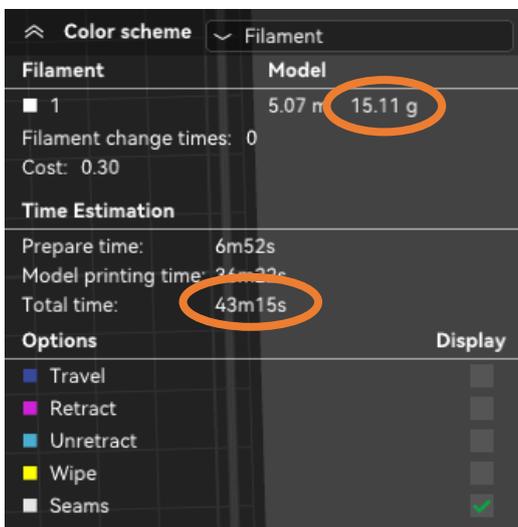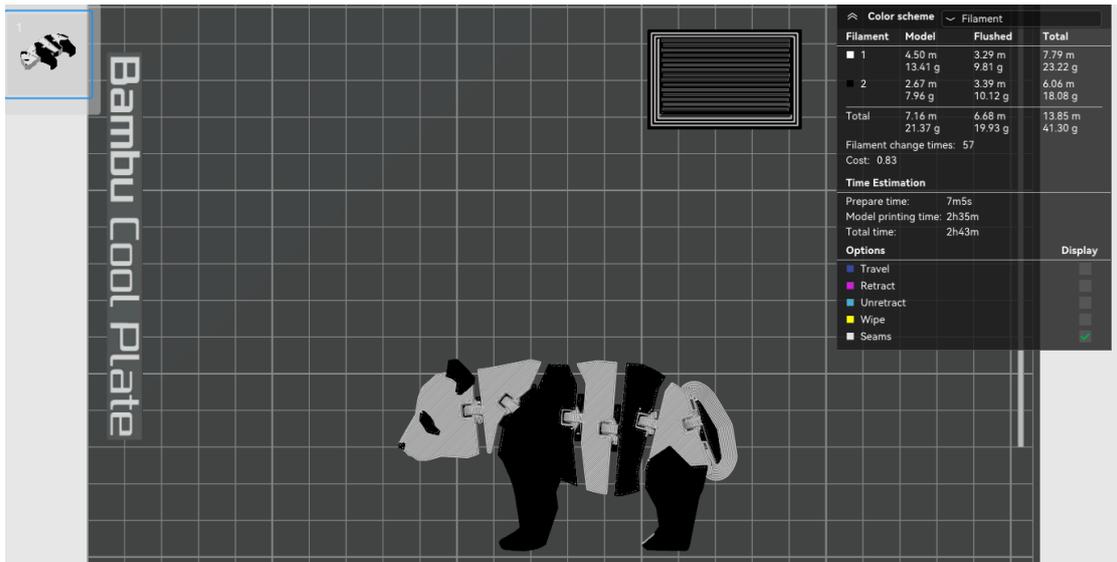
11

F. Slice and preview
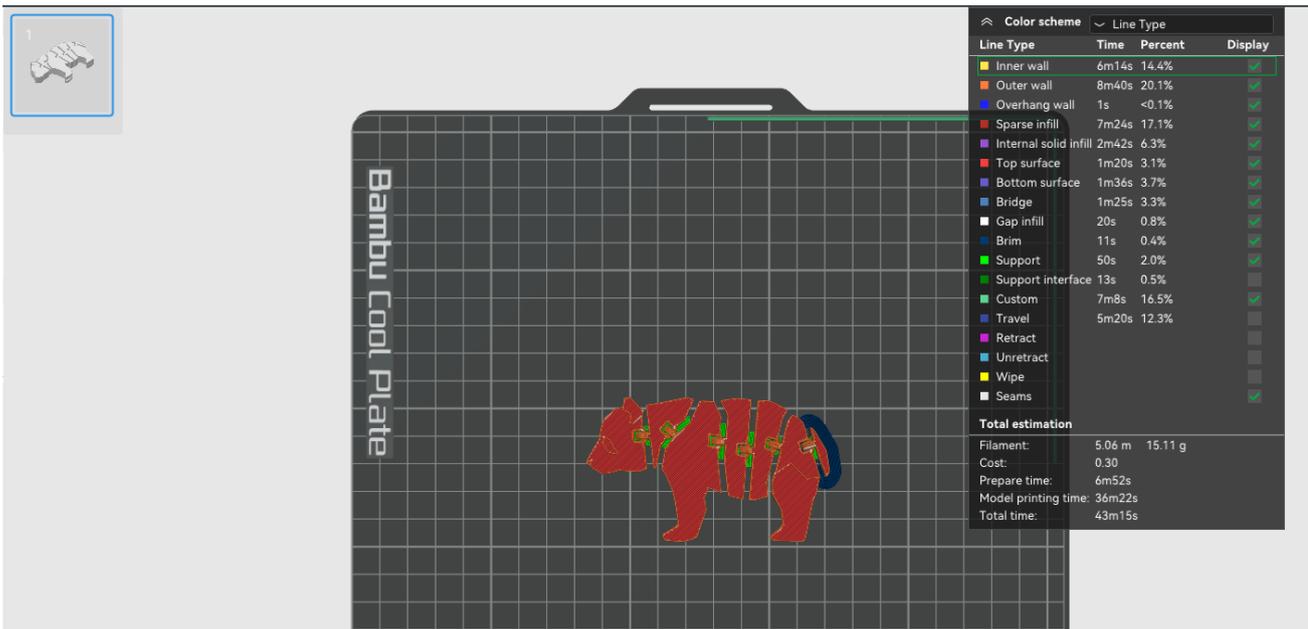
After Slicing, the estimate print time and the material usage will be shown, the printed-out model that including support will also be shown.

Sample

Single Colour:

Multi-Colour:

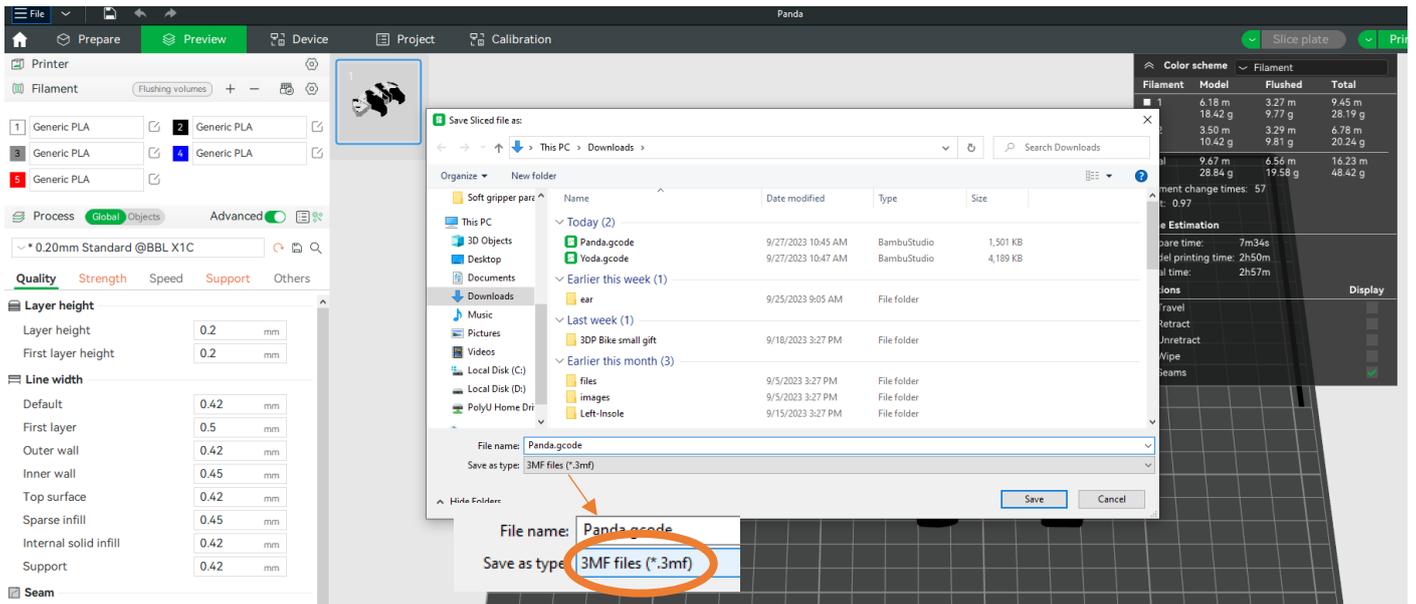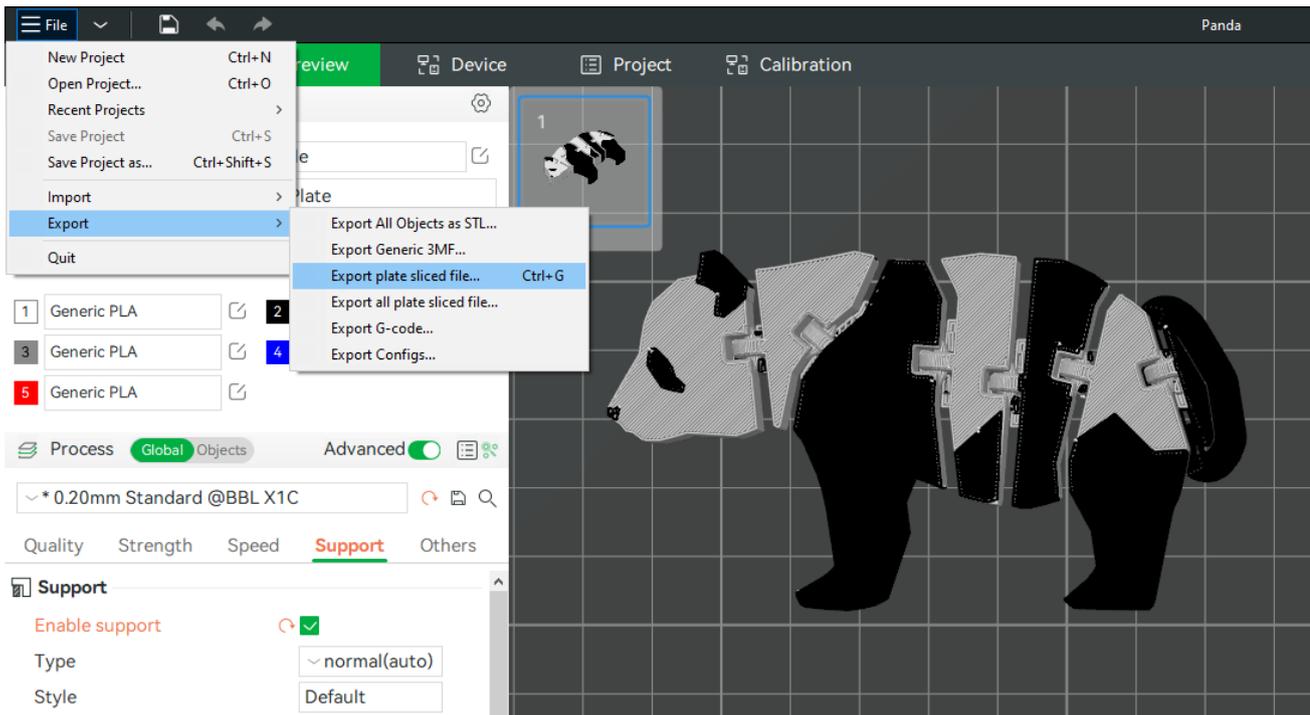|	Material Usage	Print Time	Cost
Single Colour :	15.11 g	43m 15s	$35
Multi-Colour :	41.44 g	2h 44m	$61

Given that the models are Same

Multi-Colour Model requires **More PLA filament and Printing time** than single colour model

The **Cost** of multi-colour will also be **Higher**

Printing Cost = $1 per gram + $20 platform handling charge

G. Export Plate Sliced File

Next, you are required to log in our printing service via below link and asked to import file for printing preparation. You will be able to see the total weight and estimated printing time of your model. The printing cost will be calculated according to the total weight of your model.

3. Upload the file to U3DP booking system

Go To :

https://u3dp.polyu.edu.hk/eBooking/eBookingIndex.php

Steps to follow:

Step 1: Please import your .stl file(s) to Bumba Studio and prepare the slicing file. Then, you can download the .3mf file(s) from Bambu Studio.
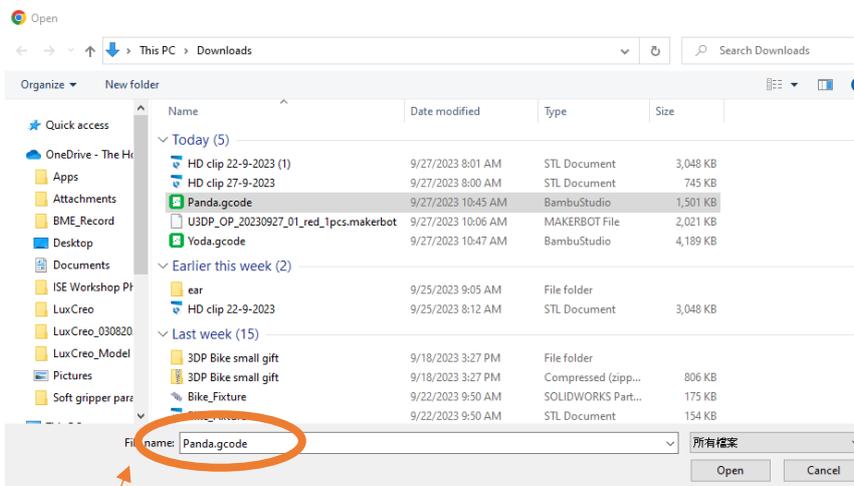
Step 2: Please upload your .3mf file(s) in this page, each submission should carry one print file only (one build plate). You can make a maximum of three submissions (three build plates in total) in one submission session.

Upload your .3mf file

The total material usage of your model(s) as indicated by Bambu Studio software.

Material usage (gram) : [* Material usage (gram)]

Quantity: [1]   Calculate

Upload your .3mf file

Select Your File (Maximum upload size is 50MB)

選擇檔案 未選擇任何檔案

Upload   Cancel

File name: Panda.gcode

Select the file you saved before

The total material usage of your model(s) as indicated by Bambu Studio software.

Material usage (gram) : [49]

Quantity: [1]   Calculate

Estimated Price

[$ 69]

Machine Type

[Bambu Lab X1 Carbon] ✔ OK

Number of plates

[1] ✔ OK

Supports Added

[true] ✔ OK
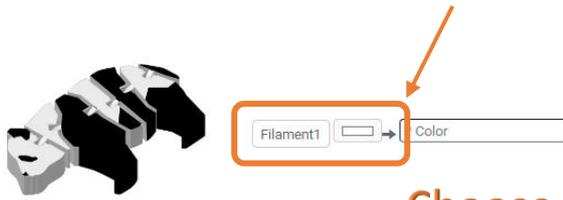
Number of Colors

[2] ✔ OK

Filament Color

Filament 1 [___]
Filament 2 [▬▬]
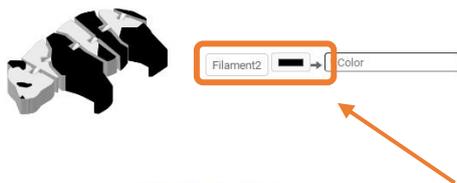
Basic Printing Information

Step 3: Select the colour swatch of material.

Note: The actual printed colour may deviate slightly from the colour swatches.

First Color Region from the model uploaded

| Filament1 | ▢ → | Color |

Choose the color by clicking the plate

(Red / Blue / White / Grey / Black)

RED **1**   BLUE **2**

3

4   **5**

GREY   BLACK

WHITE

| Filament2 | ▬ → | Color |

Second Color Region from the model uploaded

RED   BLUE

GREY   BLACK

WHITE

Confirm your order if you agree to the cost. After submit file, you will receive a mail for confirmation. We'll start the printing request on the next working day.

A confirmation email will be received after *SUCCESS SUBMIT* file

4. Complete printing & Receive email with payment notifications

You will receive 3D Printing Complete email with Payment notification once the printing is complete. Please show this email to the staff at Finance Officer's cashier counter at VA205 and settle the payment. And you can collect your printed parts at W501. You will be asked to present the receipt to us during collection.

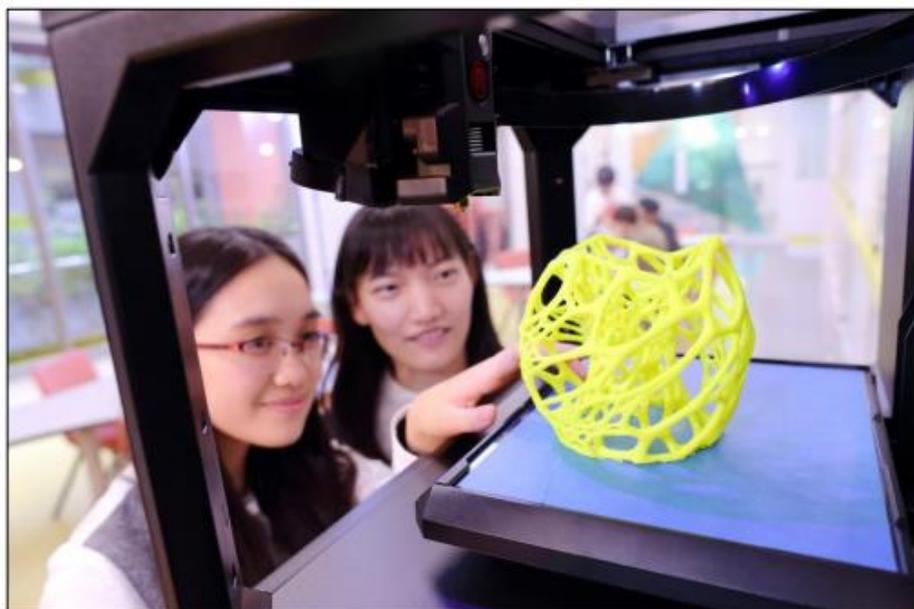**Receive an email with Payment notification after *3D Printing Complete***

5. Settle Payment

Settle the payment at Finance Office's Cashier Counter (located at VA205)

6. Present or upload receipt to collect printing parts

Collect the printing parts at W501, U3DP and remove the part support if necessary

THE END