Multi-color 3D printing with the Bambu X1-Carbon

September 2025 – www.FredricRaab.com

The Bambu X1-Carbon 3D printer with the Automatic Material System (AMS) can create objects containing up to 4 colors. However, doing so greatly increases the print time and filament wastage. So always consider printing in white and painting the object.

NEVER use multi-color to print mono-colored objects of different colors on the same bed. NOT even overnight. It needlessly wastes filament and ties-up the printer.

The larger Bambu H2D printers have 2 extruders: 1 color and 4 colors. Having two can reduce the filament waste and printing time when the primary color is installed the 1 color extruder. The Bambu Studio software adds another step in the slicing process which recommends how to configure the extruders.

To Begin:

First *create a new project*. Then select the printer and the plate type. Configure the *Filament Tab* to match the colors in the AMS. Use the + sign to add colors, typically add all four. Then click the number to select the filament color. It is recommended that the WHITE filament be in position 1 since all STL files are imported as color 1.

Now *Add* the STL file.

The process to colorize the STL model is referred to as color painting, shown as the *paint bucket* in the *Prepare* menu. Select the object, then click the paint bucket.

Three Use Cases:

1) Most common case starts with a STL file designed to be printed in one color. There are several ways to add color:

- Fill with edge detection: The easiest is to use the *fill* function (paint bucket icon). First select the desired color. Then click the *fill* icon. Then click the area of the model you wish to fill with the selected color.
- Brush onto the surface (circle icon): In this mode, you are painting free-hand on the *surface* of the model.
- Sphere: Like Brush, but also painting below the surface and into the model.
- Fill triangles: Fills the individual triangles that compose the model, one at a time.
- Paint by layers: Assigns the selected color to all selected layers of the model.

- Gap Fill Tool: Painting with the above tools often generates gap areas. They may look ugly and increase filament changes. The gap fill tool will detect small gaps and auto-fill them with the color from a neighbor facet group. Use this tool when you are finished painting and you see gaps between colors. Set the *Gap area* size and click *Apply*. Examples: Kirby, Tomorrow Land Pin, Model Rocket

2) Often on Thingiverse and Printables, you will find a single STL file that has been assembled from individual parts. To find them add “Multicolor” or “Dual Extrusion” to your search.

- Fill with edge detection: When using *fill*, the entire part will be highlighted and filled with the select color, often saving you time.
- You could use the other paint tools if desired.

  Example: Marlin

3) Sometimes Thingiverse or Printables will contain multiple STL parts that need to be assembled. Fortunately, Bambu Studio can automatically assemble these when they are added to the project. To do so,

- Create a new project and setup the filaments.
- When adding the STL files, add all parts at the same time. (Do so by shift-clicking on the filenames.)
- When Bambu asks: “Load these files as a single object with multiple parts?”, click *Yes.*
- The model should be assembled correctly. (Sometimes the creator of the model did something wrong and the model may be unusable.)
- Fill each part with the desired color (as in case 2 above.)

  Example: Penguin

Reducing Print Time and Filament Waste

There are several techniques to reduce both. The success of these techniques depends on several factors such as filament type and brand, filament colors, number of color changes, complexity of model, etc, Often trail-and-error is required.

Under the *Others* setting:

- *Flush into objects’ infill* and *Flush into objects’ support* utilizes filament that would normally be sent to the waste bucket as infill and supports.
- The *Prime Tower* is the tower created in the rear of the print bed for each filament change. If your colors are not overlapping, you can save a time and filament by disabling it. Should your light colors appear “muddy”, enable the prime tower, but try reducing the *width* from 35 to 20.

In the *Filaments* tab, *Flushing volumes* settings:

- If the flushed filament in the waste bucket shows a clean transition between colors, you can also try reducing the *Flushing volumes*. Set the *Multiplier* to 0.50, click *Re-calculate*, then *OK*. Note: you can also change the individual values, especially those in red – set to 100. Change the number(s) and then click *OK*.

Printing multiples of your object will increase overall time, but reduce the time and wastage of each object.

Extra Step for the H2D Printers:

When you mouse-over the “Slice Plate” button, a popup appears to enable extruder configuration. When accepting the default Filament-saving Mode, the software will compute the optimum configuration. Once sliced, another window will display how the colors should be configured.

Multi-Color Printing with OBJ files:

An OBJ (object file) is similar to a multi-color STL file. It contains the individual objects that make up the completed item. In Tinkercad, you can assign a color to each object in the item. However, when you export a STL file, the result is a single color object. To reproduce the colors in Bambu Studio, you need to “paint” each surface with the appropriate color.

In Tinkercad, export the item as an OBJ. When you open the file in Bambu Studio, the slicer will recognize the different colors and ask you to assign a filament color to each object. This saves you time. And it often results in truer, deeper colors since “painting” only paints the top surface layer, sometimes allowing the layer below to show through. The paint tools are available to modify the colors if desired.