3DP
3D PLATFORM
TRAINING INSTRUCTION

PRINTING THE DUAL-COLOR INFILL BOX

3DPT-0007

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APPROVALS			
Name	**Title**	**Signature**	**Date (YYYY-MM-DD)**
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APPLICABLE MODELS	
Legacy	**Work Series**
☒ X1000	☒ 100
☒ X1000 CE	☒ 200
☒ WorkBench	☒ 300
`	☒ 400

CONTROL STATUS
☐ Confidential
☐ Internal use only
☒ Uncontrolled

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Introduction & Purpose

The dual color infill box is a training tool designed to show the user how to print a multiple infill geometry within a single print. This is a great way to print the interior and exterior of a part with different infill settings.

This training instruction will guide the user through the steps of printing a model with multiple infills.

Tools & Materials

- Knife or razor scraper to remove completed prints.
- Calipers or micrometer.
- Print material (PLA material is recommended for calibration prints).
- Calibration chip gcode file
- SD card or network connection to the web interface (WorkSeries and later) to load print files.
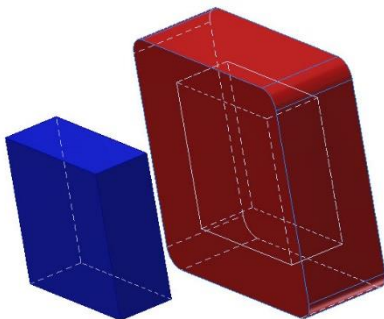
Process

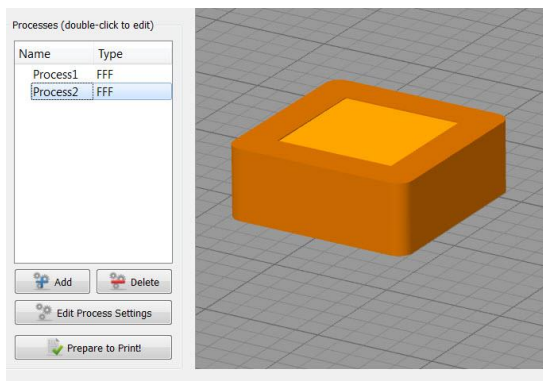## Printing the part

Prepare the printer

1. Prepare print bed. Clean the print area and apply adhesion agent if used.
2. Load material. Load print material and ensure extruder is extruding material properly.

Prepare the part

1. Prepare the solid model. The solid model is designed in two parts that will be exported as separate STL files. In this case, the base model and core model have been designed to fit together.

2. Prepare the gcode file. Import the STL files into the slicer and position the models on the build plate. Each file will have a unique process. This will allow each model to print with different settings based on the process that is selected. Be sure the dual extruder calibration has been performed prior to printing if the gcode requires both extruders.

3. Load file using SD card or web interface.

Start print

Print the gcode file and observe during the print. Ask these questions during the print.

- Are the extruders aligned properly?
- Are the extruders printing the correct part?
- Is the material cooling properly?

    The extruders must be aligned properly for the part to print correctly. If the extruders are not aligned properly, the prints will intersect one another. If the processes are not set up correctly, the infill patterns may not be produced by the correct extruder. If the material is not cooling properly, the material may become stringy or molten from too much heat build up.

Inspecting the part

Visual inspection:

Look at the dual color infill box after removal. There are visual and tactile clues to indicate whether the box has been properly printed. There are three possible errors that could occur

1. The extruders are not properly aligned. If this has occurred, the models will intersect with one another. This is critical to print success and printing in the proper location.

2. The incorrect extruder is printing the part. If you expected the inside to be printed with Extruder 0 and it begins printing with Extruder 1, the incorrect extruder has been selected.
3. The material is not cooling. The print will look "goopy" or molten.   The fan is most likely not turned on or the print is running too quickly for the material to cool. The print must cool properly in order to print both models accurately.

Tool inspection:

1. Use a set of calipers to measure the outer walls of the box and the Z height. Exact dimension will depend on which gcode file is printed, but will be displayed on the machine control once the print is complete (look for current z height).

Correcting the part

Corrections will depend on what is found during inspection.

1. **The extruders are not properly aligned.** Re-calibrate the tool offsets. The tool offset values need to be adjusted in order to print the models in the correct location.
2. **The incorrect extruder is printing the part.** Return to the slicing software. Verify that the correct extruder is selected in the correct process. This is especially important when printing with two different materials.
3. **The material is not cooling.** If the layers look molten, verify that the fan is turned on in the slicer and on the printer console. If the fan is running, lower the print speed to allow more time for each layer to cool properly.

If changes are made within the slicer, reprint the coring cube until the desired result is achieved.

Wrapping up

The coring cube is a great tool to get started with multiple models and infill patterns. Try a few different geometries before printing large parts and save your results.

Conclusion

The coring box is a simple but effective tool to introduce the possibilities of multiple materials and multiple infill settings. This print demonstrates the importance of calibrating the tool offsets properly, proper cooling, and provides a foundation for printing with multiple infill patterns.