



Operation Guide for Mixing Color printer

V1.1

Symbols

- Extrusion feeder:** A mechanism to transport filament to the hotend.
- Hotend:** The part to melt and eject filament.
- Nozzle:** The outlet at the front end of the hotend, usually made of copper, use the size of the front hole to describe its main size.
- Print head:** The hotend and its attached cooling system.
- Control panel:** The system that realizes human-machine interface in 3D printer.
- Mixer:** The parts and software to realize the color mixing function.
- Mixing Extruder:** An extruder that can mix different color filament together.
- Channel of Hotend:** The channel through filament enter into the mixing hotend.
- Tool Chain (Tool head):** In short, one tool chain corresponds to one printing color, in most slicing software, tool chain is also be called extruder.

For singel color or general multicolor printer, each extrusion feeder corresponds to one hotend/nozzle, so the number of tool chain is equal to the extrusion feeder and nozzles.

For mixing color printer, because the same hotend can print different colors, so we can set many tool chains.

- Virual Extruder / Virsual Tool Chain:**

In mixing color extruder, multiple extrusion motors correspond to one nozzle. One combination of extrusion rates can correspond to one tool chain. In order to distinguish them from single color and simple multi color 3d printer, they are called **Virsual Tool Chain**.

- Gradient Mixing:**

A function of automatic color mixing transformation processing. When starting a print file from SD card (slicing it with single color), it will automatically adjust the mixing ratio of extruder according to the preset ratio (preset virtual extruder) when the printing height changes, so as to realize a Gradient color effect.

- Random Mixing:**

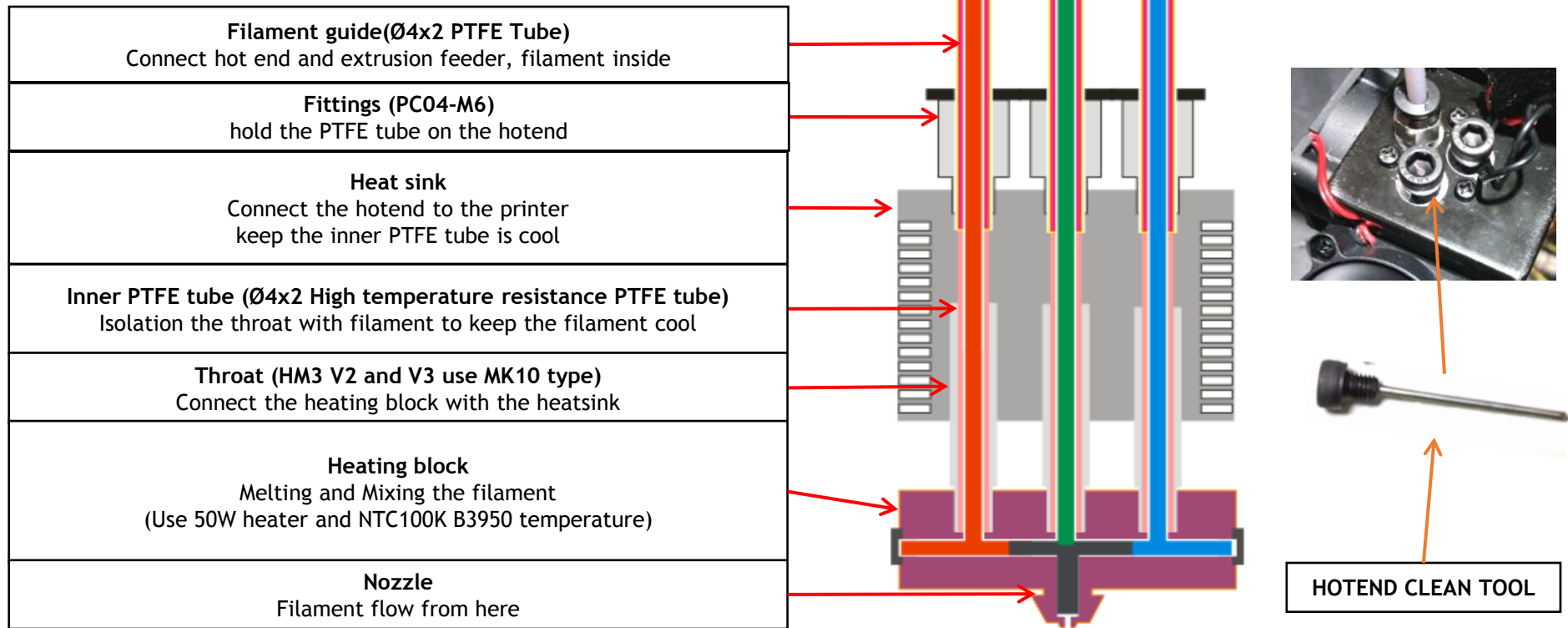
A function of random color mixing transformation processing. When you start a print file from SD card (slicing it with single color), it will randomly adjust the mixing ratio of extruder when the printing height changes, so as to realize a **Random color** effect.

- Hotend Clean tool:**

A screw with a small rod which can be used to clean the feeding channel at the hot end, or to close the temporary non feeding channel.

Principle and structure of hotend

- Different more than one color filaments are fed into the HOTEND by extrusion feeder, they are melted in the heat block and mix together and then flow out from nozzle. **By adjusting the feeding ratio of extrusion feeder, we can get different color filament from the nozzle.**

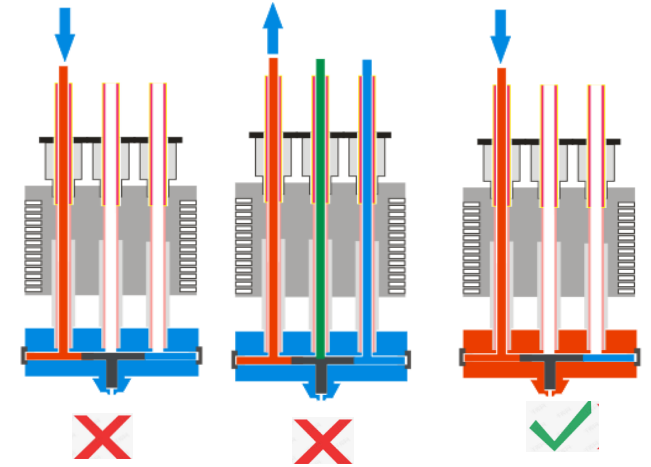


NOTE: This figure is a schematic illustration of the principle, actual structure may different!!

- Since the individual channels are ultimately connected, the filament may flow backwards into the empty channel, which can cause the empty channel be clogged. Therefore, we **must insert filament or use "HOTEND clean tool" to close the unused channel to prevent the melted filament to reflux.**
- Because there is a color mixing cavity inside hotend, **when switching extruder, it does not immediately switch to the desired color.**
- **Keep the heatsink to cool is very important, otherwise the filament can't be push to the nozzle well, it will cause the clogged issue, make sure the cooling FAN working when nozzle temperature is over 60 degree.**
- PC04-M6 fitting is easy to break, do not use a wrench to tighten it.

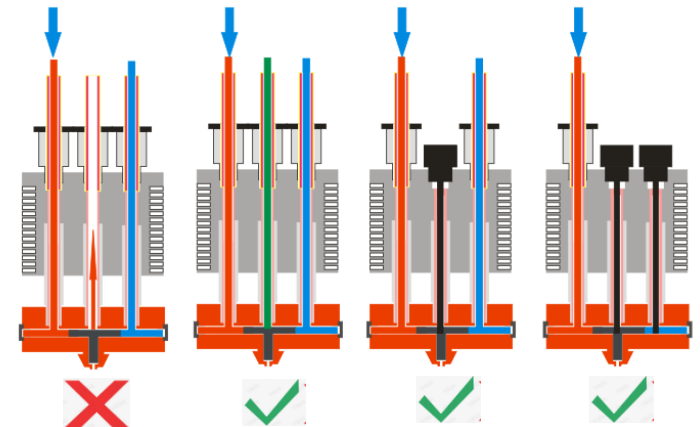
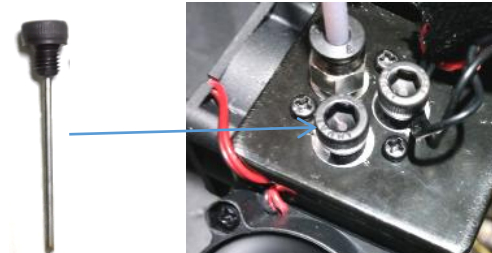
!!ATTENTION!!

DONOT load / unload filament when the nozzle temperature is less than 150 °C



DONOT feed-in filament over 10mm if any of the channels is empty, otherwise may cause it be clogged.
you can:

1. Load filament to all channels
2. Use a *hotend clean tool* to close empty channels.



How to print singel color 3d object

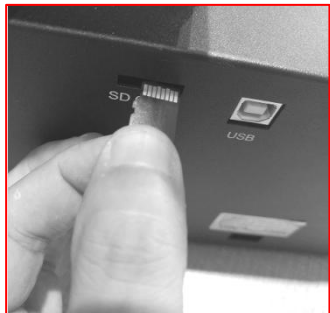
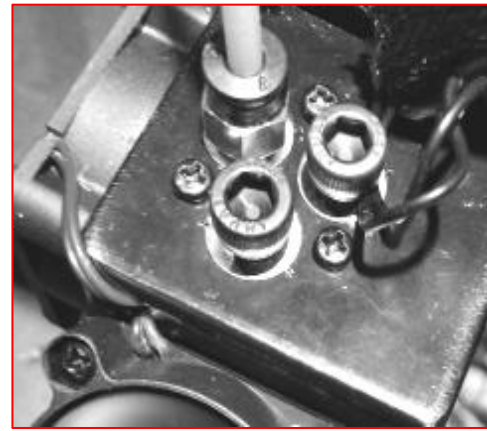
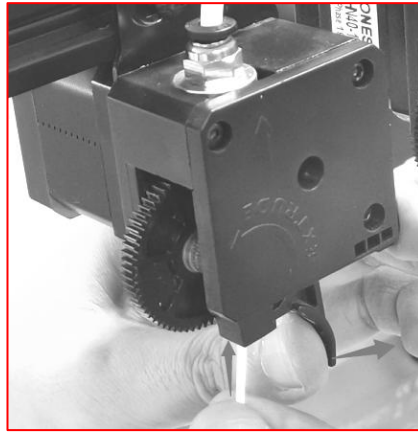
Step 1: Refer to the [silcing guide for mixing color printer](#) to covert the 3d mode file to gcode file.

Step 2: Preheat the nozzle to about 170 degree

Step 3: Use hotend clean tool to close the unused channle of hotend

Step 4: load filament to the hotend. **NOTE: For M4 printer, recommend to load the filament to the center channel.**

Step 5: print gcode file from SD card



How to realize gradient printing

ZONESTAR mixing color printer can convert a single color object to a **gradient** color object, process as follows:

Step 1. Refer to the previous page to start to print a single color gcode file

Step 2. Set on the LCD menu>>

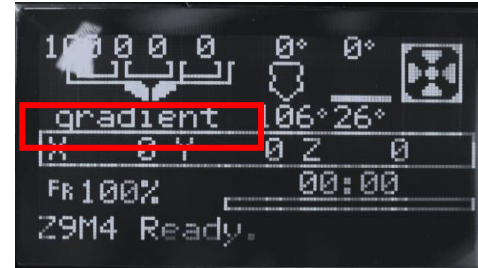
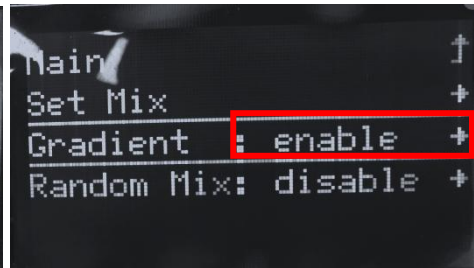
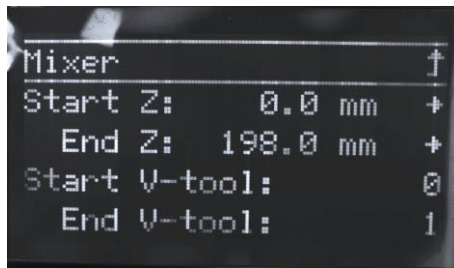
Mixer>>Gradient: **disable** >>

Start Z: set the start Z height End Z: set the END Z height

Start V-tool: 0 End V-tool: 1

After set Start Z isn't equal to the End Z, and Start V-tool isn't equal to

End V-tool, the LCD will show "Gradient : **enable**" and on the ideal menu shows **gradient**



There is another auto mixing model called **random mix**, the process is almost the same with **gradient** mixing, but you don't need to set the V-tool, it will auto set the mixrate automatically,

Tips:

You can add a **M166/M167** command in the **start gcode** of slicing software to apply gradient/random mixing printing, so it can automatically work when print from SD card.

For example: **M166 S1 A0 Z200 I0 J1**

S1 → Enable gradient mix **A0** → startZ is 0mm **Z200** → EndZ is 200mm **I0** → Start V-tool is 0 **J1** → End Vtool is 1

For example: **M167 S1 A0 Z200**

S1 → Enable random mix **A0** → start Z is 0mm **Z200** → End Z is 200mm

Hot to print multi-color 3d object

Step 1: Refer to the [silcing guide for mixing color printer](#) to covert the 3d mode file to gcode file.

Step 2: Preheat the nozzle to about 170 degree

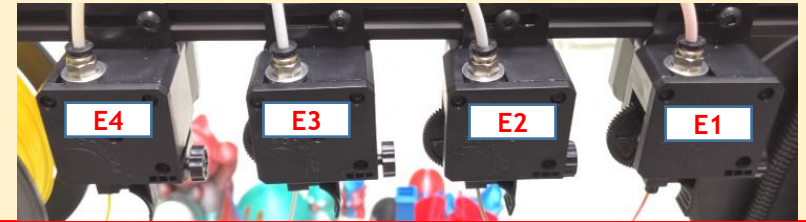
Step 3: Load filament to the hotend, and use hotend clean tool to close the unused channles

Step 4: print gcode file from SD card

TIPS 1:

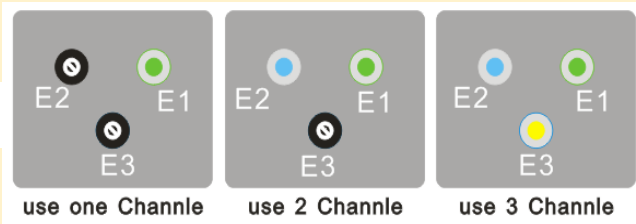
Make a mark on the extrusion feeder in order to quickly distinguish the extruder

PS: Their sequence depends on wiring

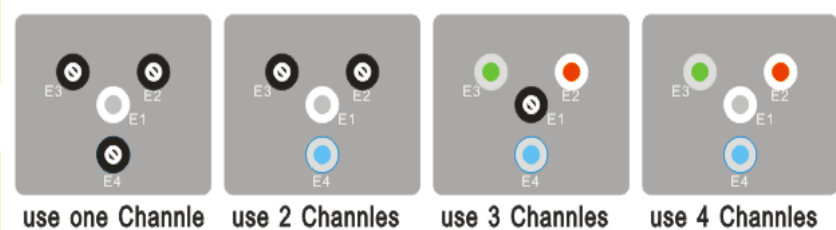


TIPS 2: Recommended channels for different quantities of filaments

M3



M4



TIPS 3:

The steps to load filaments:

1. Heat nozzle, and then use *hotend clean tool* to close unused channel (remove the fittings first)!
2. load all of the filaments into the hotend, stop when it enter the hotend about 30~40mm.
3. **MENU>>Motion>>Move axis>>Set V-TOOL to 3**(for M3) or 4(for M4).
4. **MENU>>Motion>>Move axis>Extruder>> feed until the filament flow from the nozzle**

