Zonestar

Operation Guide for Mixing Color Extruder

V1.4

For the 4th version M3 and M4 hotend

•**Structure of mixing color hot end**

Diagram labels: Filament, Filament guide, Fitting, Heatsink, Insulation block (**PEEK**), Heating block, Heater, Temperature sensor, Nozzle
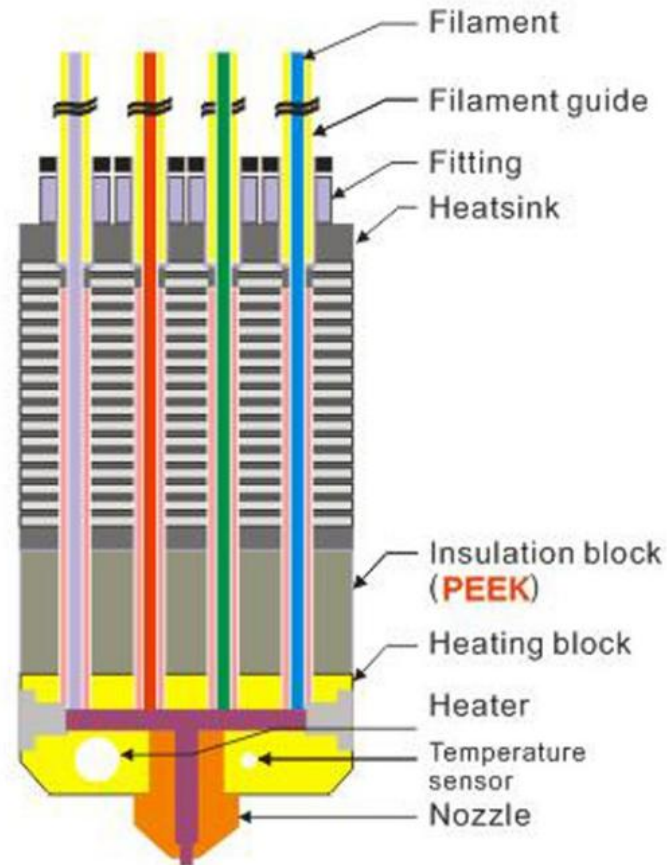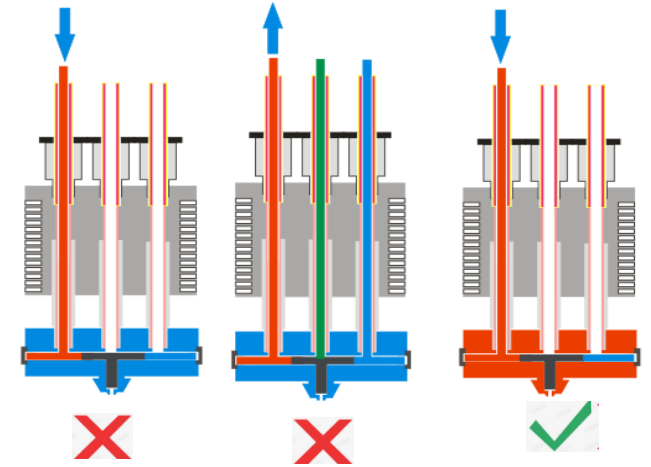
•**Color mixing principle:**
1. Filaments melt and mix in the mixing room, and then flow out from the nozzle.
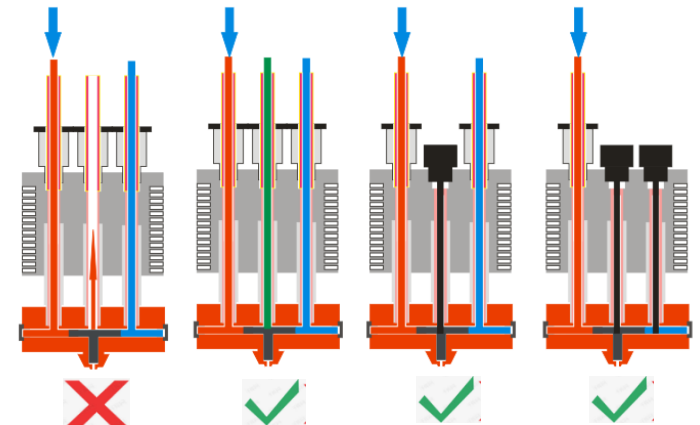2. To change the feed ratio, it can get different color filament.

!!ATTETION!!

DO NOT load / unload filament when the nozzle temperature is less than 150℃

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 the empty channels.

How to print single 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, and use "hotend clean tool" to close the others channels.**

Step 5: print gcode file from SD card and fine tune the distance between the nozzle to the bed.
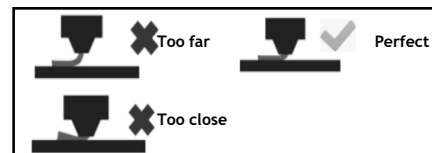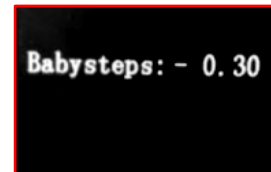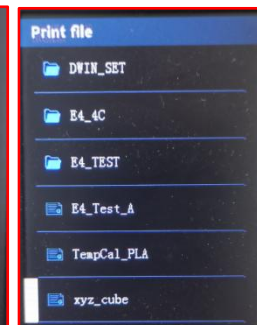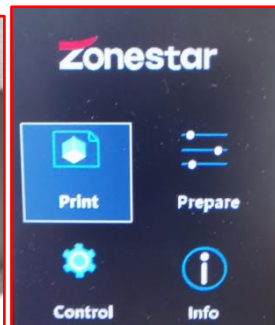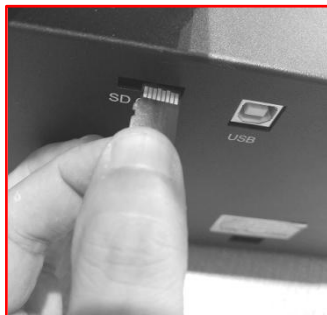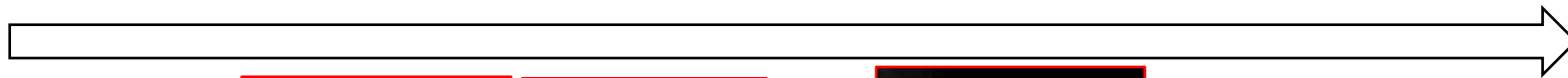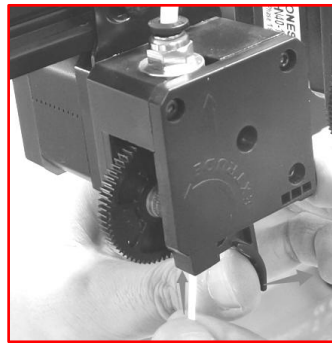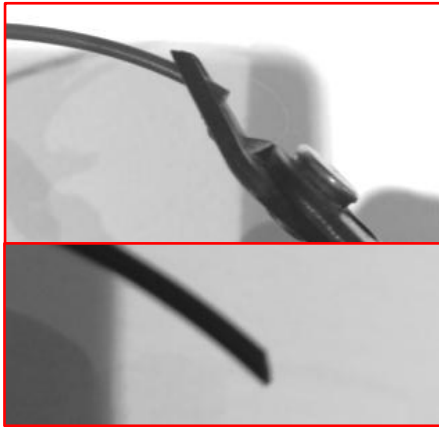
Change print color by adjust mixing rate

Step 1. Start to print a singel color gcode file(Vase.gcode) from SD card.

Step 2. For TFT screen, set on the menu>>

●Mixer>>Current V-TOOL: Select the vtool currently printed, or use the default value, range is 0 ~ 15.

●Mixer>>Mix>>Extruder1~3(4 for M4): Arbitrarily adjust the percentage of extruder 1~4, range is 0 ~ 100.

●Mixer>>Mix>>Comit V-tool: Redistribute the percentage of all extruders in proportion and send it to the current vtool. The current vtool value changes color.

After setting up, enter printing, on the printing menu shows: *Mix 0*
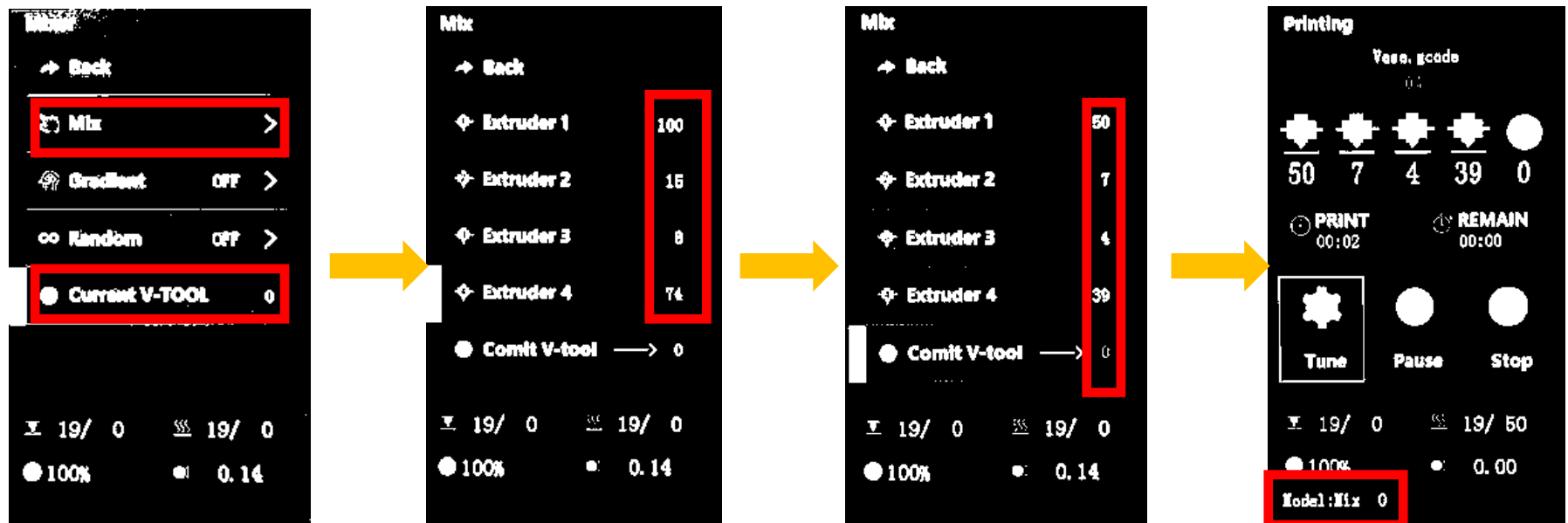
Realize Gradient Mix printing from LCD screen

Step 1. Start to print a singel color gcode file(*Vase.gcode*) from SD card.

Step 2. For LCD-DWIN screen, set on the menu>>

Mixer>>Gradient: OFF >>

>> Start Z: set the start Z height (such as:0mm)

>> End Z: set the END Z height (such as:200mm)

>> Start V-tool: set the start V-tool (such as:0)

>> End V-tool: set the end V-tool (such as: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 shows

"Gradient : ON" and on the printing menu shows: *Gradient 0--->1*

Realize random mixing printing from LCD Screen

Step 1 Start to print a singel color gcode file(*Vase.gcode*) from SD card.

Step 2. For LCD-DWIN screen, set on the menu>>

Mixer>>Random: OFF >>

>> Start Z: set the start Z height (such as:0mm)

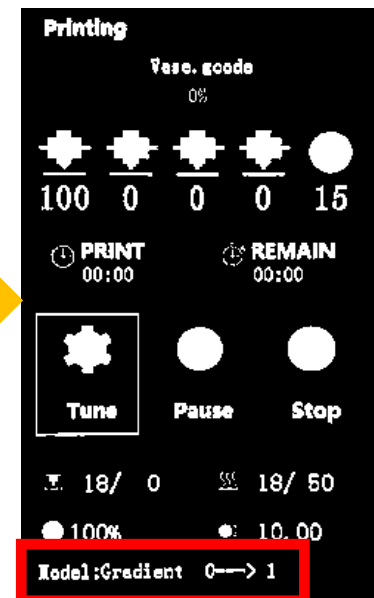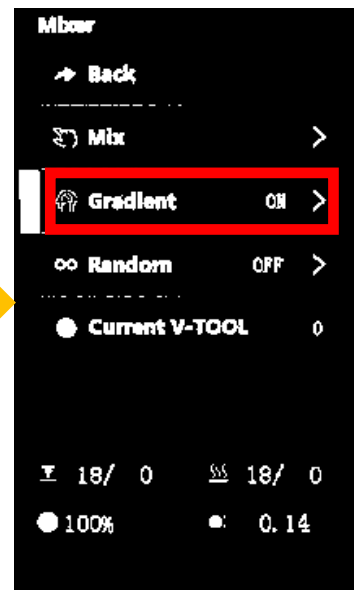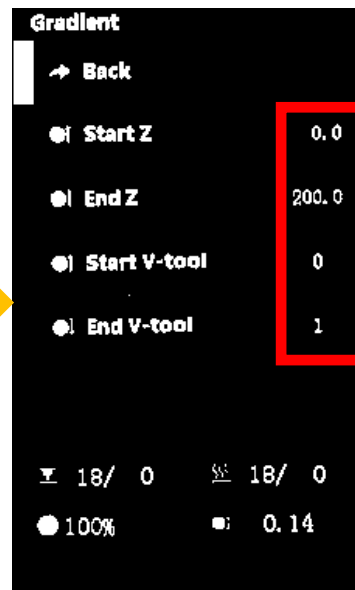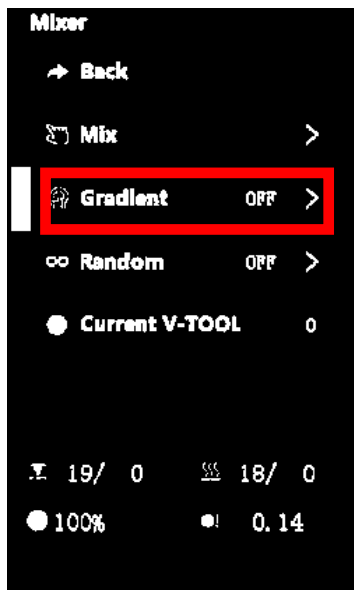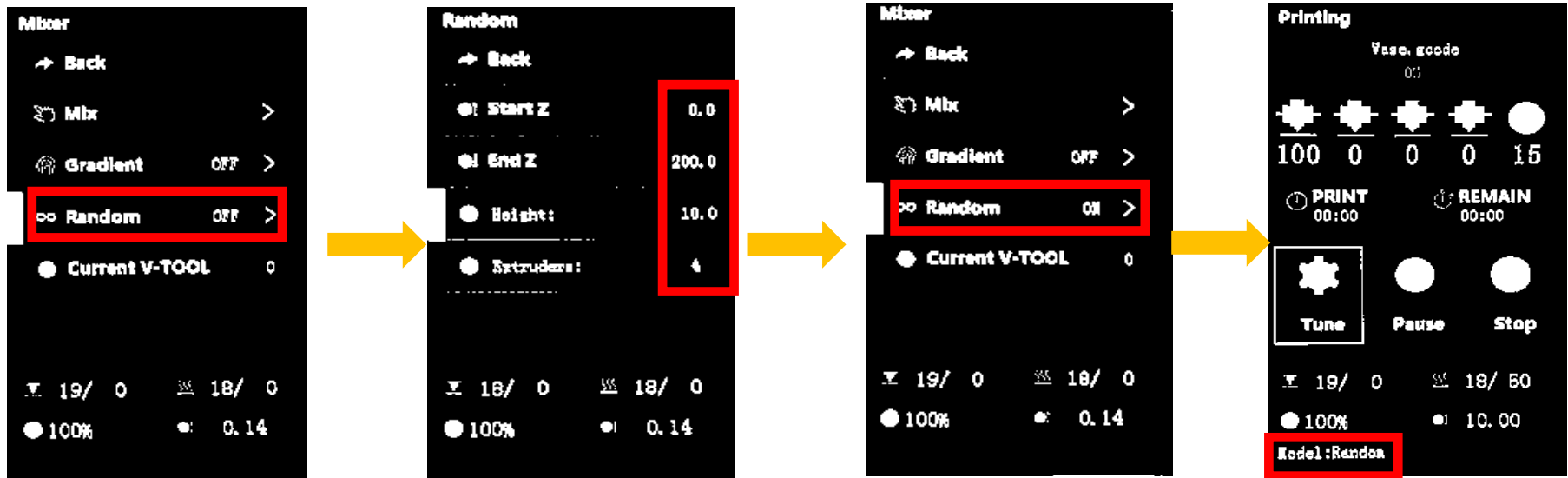>> End Z: set the end Z height (such as:200mm)

>>Height: set interval distance (such as:10mm), When the z-axis distance changes beyond this value, the mixing

ratio changes randomly once.

Extruders: set the number of extruders with random variation (such as:4)

After set Start Z isn't equal to the End Z, the LCD will shows "Random : ON" and on the printing menu shows:

Random

Realize Gradient Random Mix Printing by Modifying Gcode File

You can add a **M166/M167** command into a single color gcode file, then when you print this gcode file, it will realize gradient/random mix printing automatically.

Tips: you can use any "text editor software" to open the gcode file.

◆**Gradient Mixing.** *Command: M166 S[x] A[x] Z[x] I[x] J[x]*
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

◆**Random Mixing.** *Command: M167 S[x] A[x] Z[x] H[x] E[x]*
For example: **M167 S1 A0 Z100 H0.2 E3**
S1➔Enable Random mix **A0** ➔ startZ is 0mm **Z100** ➔ EndZ is 100mm **H0.2** ➔ change color every 0.2mm height
E3 ➔ 3 extruders (E0~E2) will be used to mix

Please note that M166/M167 command should be add to after T0 command in the gcode code, because Tx command will stop automatic gradient/Random mixing function. Usually single color gcode file only has a T0 command and put on the start several line.

```
/**
 * M166: Start a gradient mix
 *
 * S[bool]  - Enable / disable gradients
 * A[float] - Starting Z for the gradient
 * Z[float] - Ending Z for the gradient.
 * I[index] - V-Tool to use as the starting mix.
 * J[index] - V-Tool to use as the ending mix.
 **/
```

```
/**
 * M167: Start a random mixing
 *  S[bool]  - Enable / disable random mixing
 *  A[float] - Starting Z for the random mixing
 *  Z[float] - Ending Z for the random mixing
 *  H[float] - Minimum height of changing mixing rate
 *  E[int] - how many extruders used on random mixing
 * */
```

How 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.
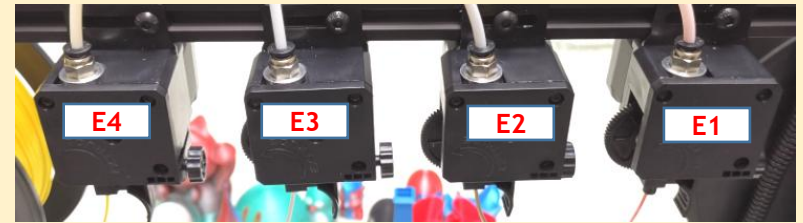
Step 2: Preheat the nozzle to about 170 degree

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**(4C_Niko_Dog.gcode)**
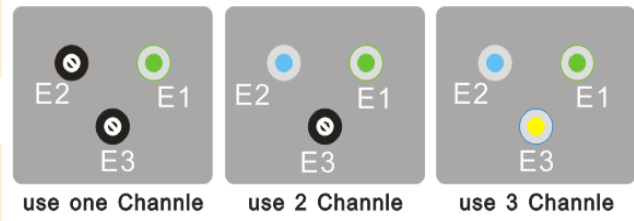

TIPS 1:
Make a mark on the extrusion feeder in order to quickly distinguish the extruder
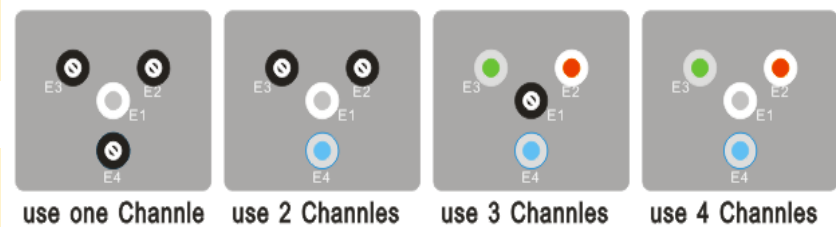**PS: Their sequence depends on wiring**

E4   E3   E2   E1

TIPS 2: Recommended channels for different quantities of filaments

M3

E2   E1
E3
use one Channle

E2   E1
E3
use 2 Channle

E2   E1
E3
use 3 Channle

M4

E3   E2
E1
E4
use one Channle

E3   E2
E1
E4
use 2 Channles

E3   E2
E1
E4
use 3 Channles

E3   E2
E1
E4
use 4 Channles

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
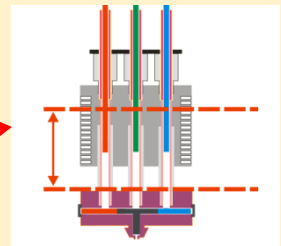
How to slicing multi-color 3d object

About how wo slicing, please refer to the guide in this link:
https://github.com/ZONESTAR3D/Slicing-Guide