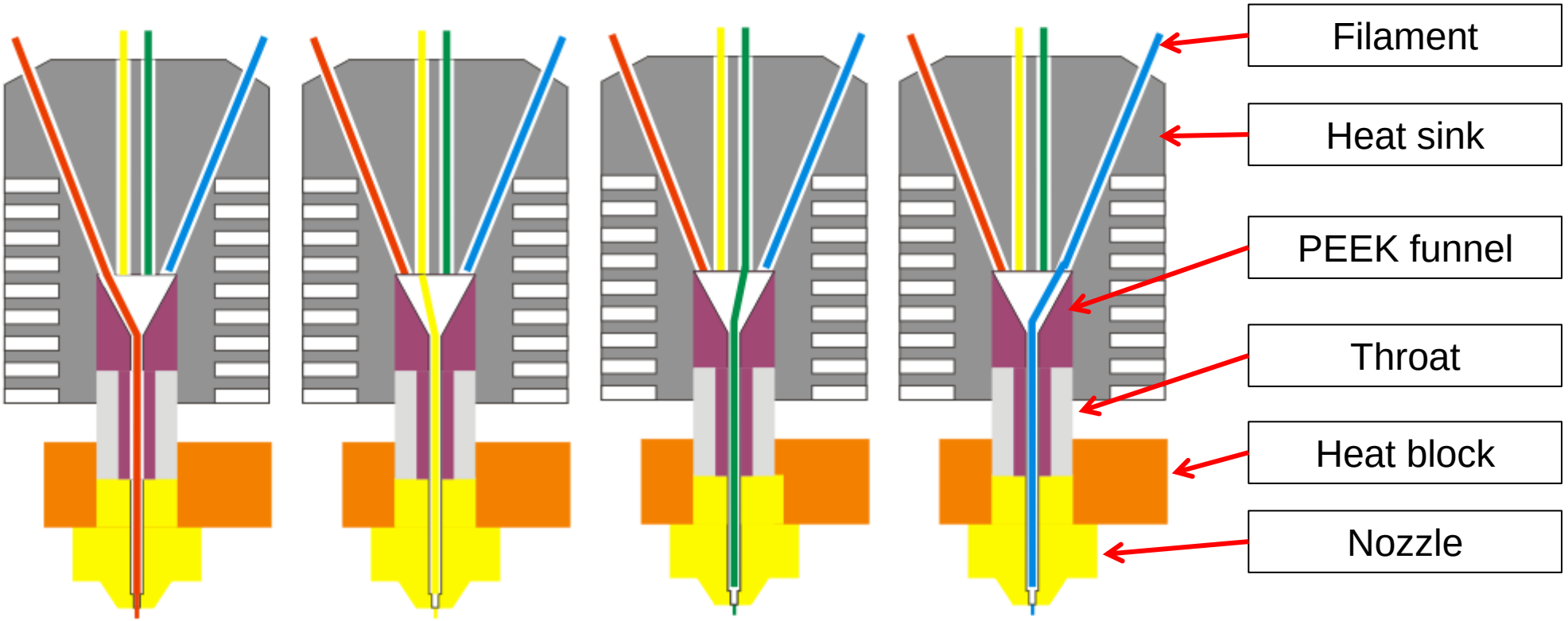
Zonestar

E4 Hotend(print head) User Guide

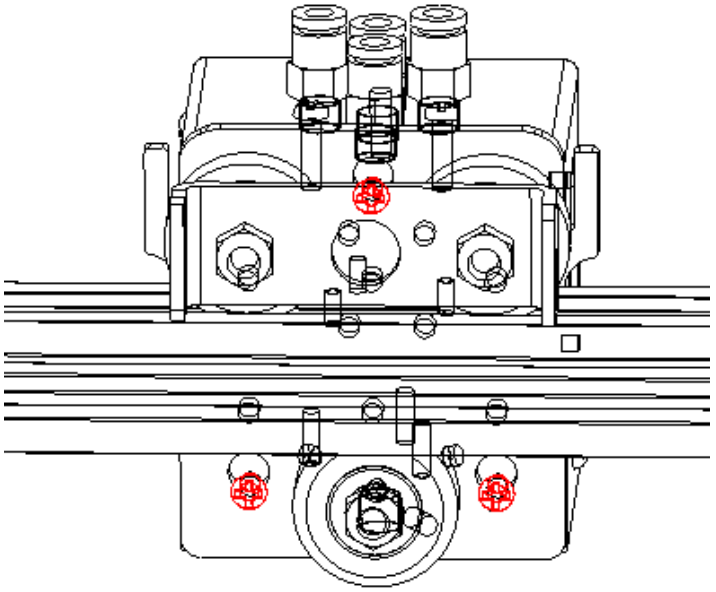
V0.1

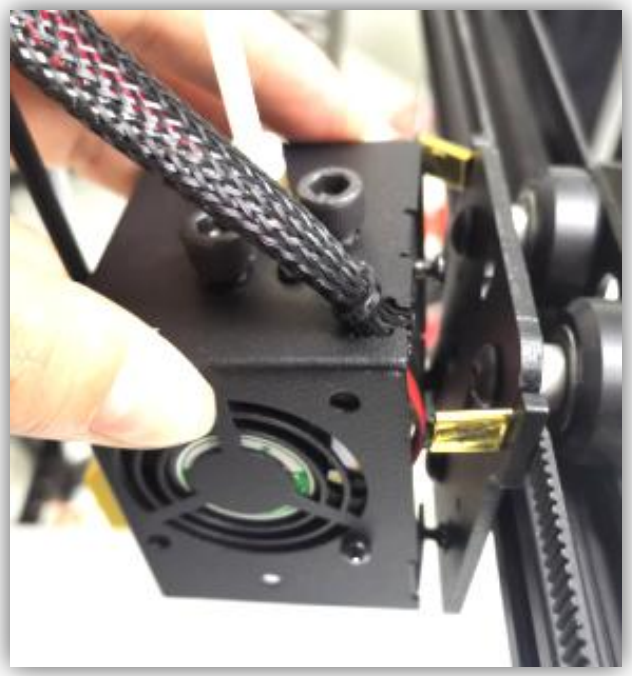
Brief introduction of working principle

There are 4 input channels and 1 nozzles on the E4 hotend, when switching color, we need to “retract” the previous color filament first and then load the next color filament

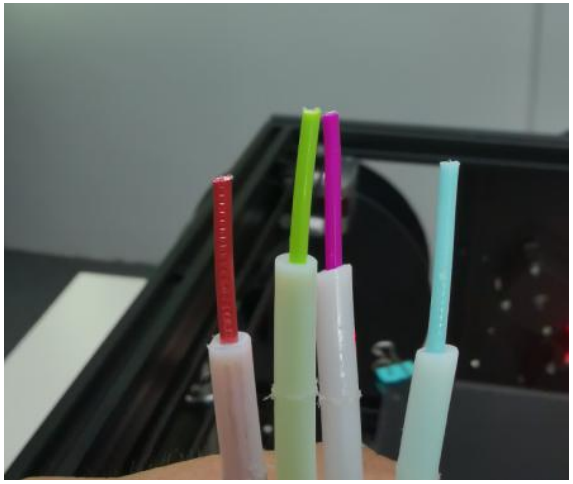


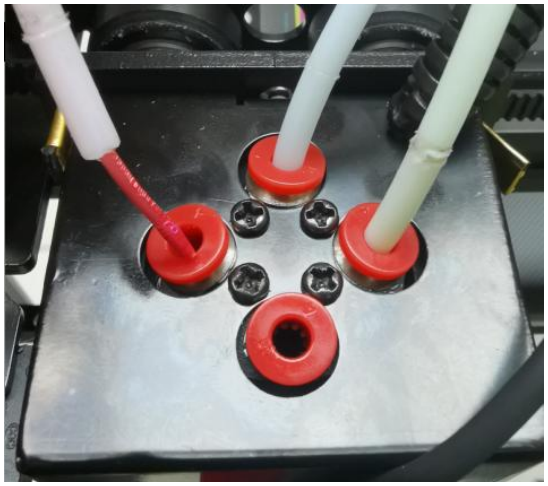
Install the print head to the printer

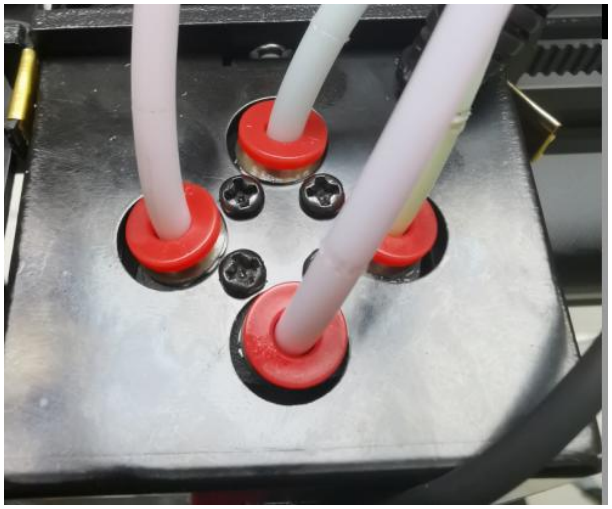




Load filament







1. The filament extend 10 ~ 15mm out of PTFE pipe
2. Insert the PTFE into the fittings

NOTE:

1. **How many colors need to be print, how many colors of filament be loaded, let the unused channels empty.**
2. **Do not skip the extruder motor to load filament, for example, when printing two colors, do not use extruder 1 and extruder 3 or extruder 2 and extruder 3, MUST use extruder 1 and extruder 2.**

Download and Install Cura

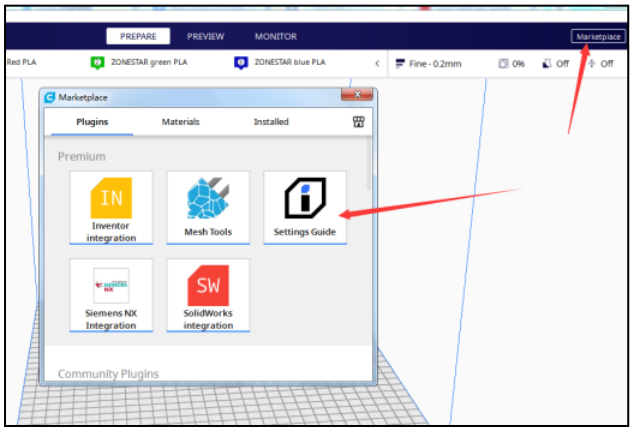
●Download cura from the below link and install it to your PC:

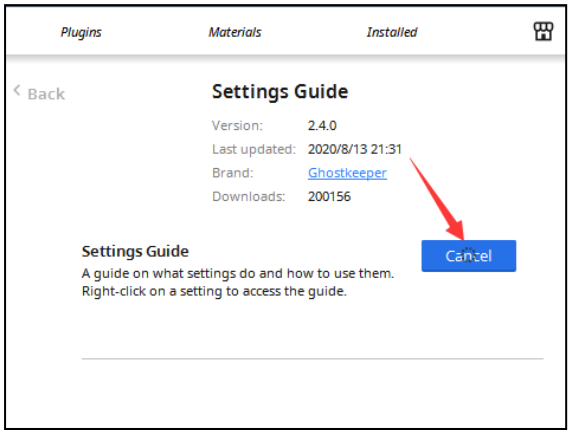
https://ultimaker.com/software/ultimaker-cura

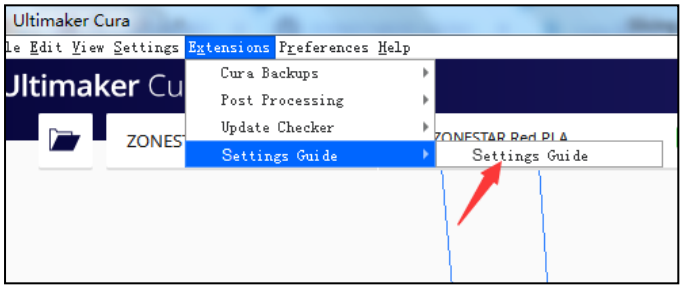
●About how to install and use Cura, please refer to this link:

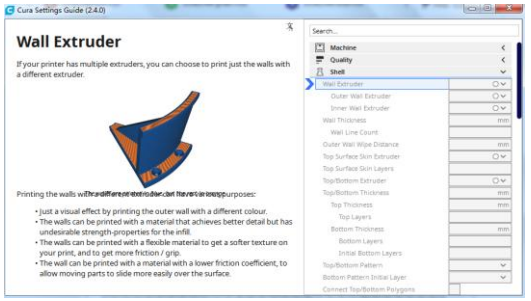
https://support.ultimaker.com/hc/en-us/categories/360002327600

●If you want to know more about the settings of cura, please install a “settings guide” plugin in cura, and then open it to study:



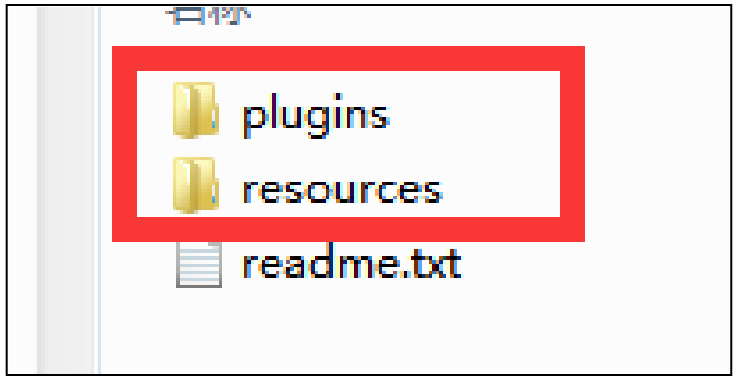


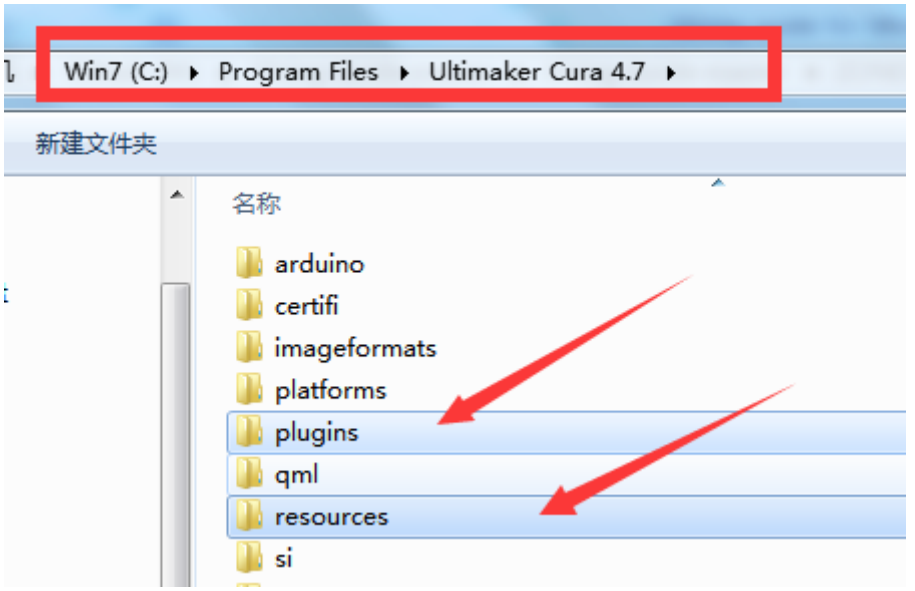




Import ZONESTAR printer settings

1. Download "zonestar Cura Resources “ from the below link:
   Download link: https://github.com/ZONESTAR3D/Slicing-Guide
2. Copy the contents of this sirctory to the installation directory of Cura



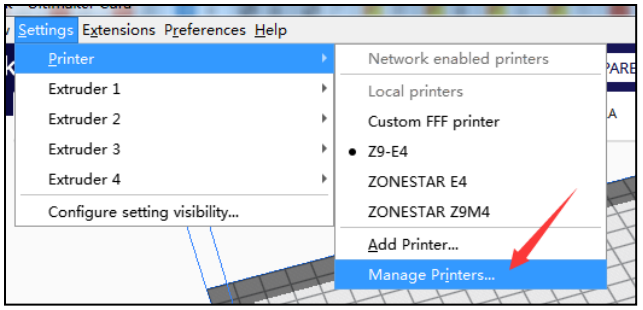


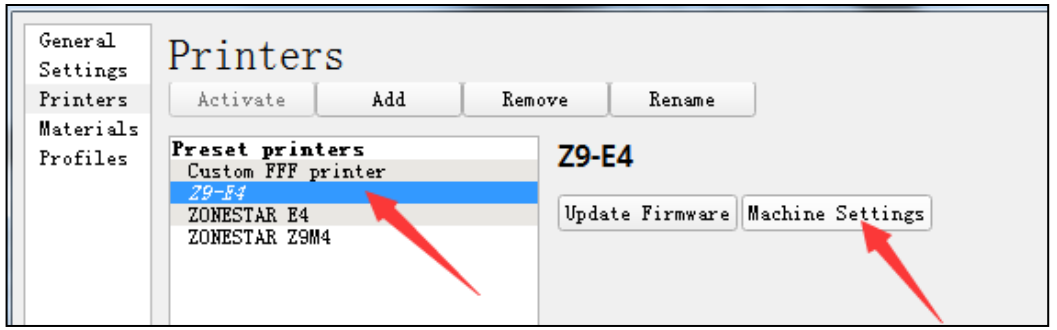
3. Run the cura

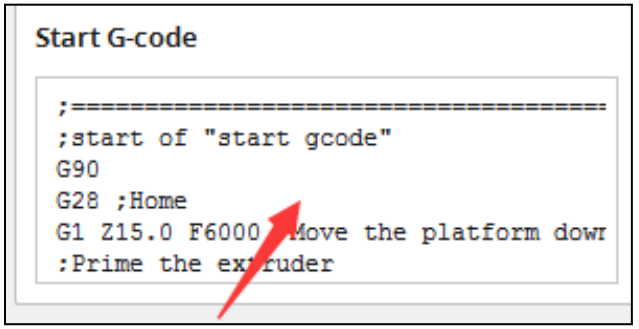
Setting up printer - start gcode and endgcode

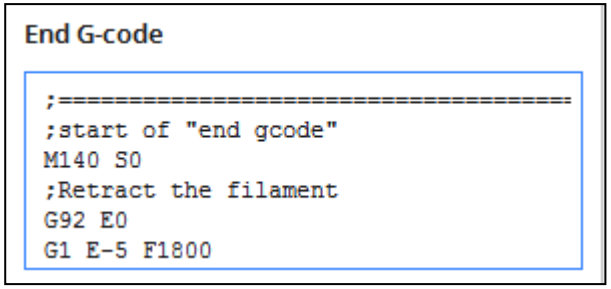
We need to some gcode command into the “start gcode” in order to preload filament.

1: Open “Manage printers”









2: We store the start gcode in the “E4 start gcode.txt” file, please open it and copy the content and pase into the above window of cura (“start g-code”).

NOTE: This gcode is for printing 4 color, you can delect some commands if you only Print 1~3 color, about the detail, please refer to the next page.

Setting up printer - start gcode

Pre-load filaments into the hotend

```
6  ;Pre-load filament
7  ;E1
8  T0
9  G92 E0
10 G1 E30 F1200
11 G1 E40 F360
12 G1 E60 F180
13 ;E2
14 T1
15 G92 E0
16 G1 E60 F1200
17 G1 E40 F300
18 ;E3
19 T2
20 G92 E0
21 G1 E60 F1200
22 G1 E40 F300
23 ;E4
24 T3
25 G92 E0
26 G1 E60 F1200
27 G1 E40 F300
```

E1 (lines 7–12) · E2 (lines 13–17) · E3 (lines 18–22) · E4 (lines 23–27)

Line 7~27 is for pre-load filament into the hotend, you can

delet the lines if you haven't used that extruder.

Prime nozzle gcode

E1

```
33 ;Prime the nozzle
34 ;E1
35 T0
36 G92 E0
37 G1 X10 Y80 E7 F600
38 G1 X10.5 Y80 E7.5 F600
39 G1 X10.5 Y10 E14 F600
40 G1 X11 Y10 E14.5 F600
41 G1 X11 Y80 E21.5 F600
42 G1 X11.5 Y80 E22 F600
43 G1 X11.5 Y10 E29 F600
44 G1 X12 Y10 E29.5 F600
45 G1 X12 Y80 E36.5 F600
46 G1 X12.5 Y80 E37 F600
47 G1 X12.5 Y10 E46 F600
48 G1 X13 Y10 E46.5 F600
49 G1 X13 Y80 E53.5 F600
50 G1 X13.5 Y80 E54 F600
51 G1 X13.5 Y10 E61 F600
52 G1 X14 Y10 E61.5 F600
53 G1 X14 Y80 E68.5 F600
54 G1 X14.5 Y80 E69 F600
55 G1 X14.5 Y10 E76 F600
56 G1 X15 Y10 E76.5 F600
57 G1 X15 Y80 E83.5 F600
58 G1 X10 Y80 E84 F600
59 G92 E0
60 G1 E-5 F1800
61 G1 E-15 F180
62 G1 E-45 F900
```

E2

```
64 ;E2
65 ;
66 T1
67 G92 E0
68 G1 E10 F900
69 G1 E20 F180
70 G92 E0
71 G1 X10 Y150 E7 F600
72 G1 X10.5 Y150 E7.5 F600
73 G1 X10.5 Y80 E14 F600
74 G1 X11 Y80 E14.5 F600
75 G1 X11 Y150 E21.5 F600
76 G1 X11.5 Y150 E22 F600
77 G1 X11.5 Y80 E29 F600
78 G1 X12 Y80 E29.5 F600
79 G1 X12 Y150 E36.5 F600
80 G1 X12.5 Y150 E37 F600
81 G1 X12.5 Y80 E46 F600
82 G1 X13 Y80 E46.5 F600
83 G1 X13 Y150 E53.5 F600
84 G1 X13.5 Y150 E54 F600
85 G1 X13.5 Y80 E61 F600
86 G1 X14 Y80 E61.5 F600
87 G1 X14 Y150 E68.5 F600
88 G1 X14.5 Y150 E69 F600
89 G1 X14.5 Y80 E76 F600
90 G1 X15 Y80 E76.5 F600
91 G1 X15 Y150 E83.5 F600
92 G1 X10 Y150 E84 F600
93 G92 E0
94 G1 E-5 F1800
95 G1 E-15 F180
96 G1 E-45 F900
```

E3

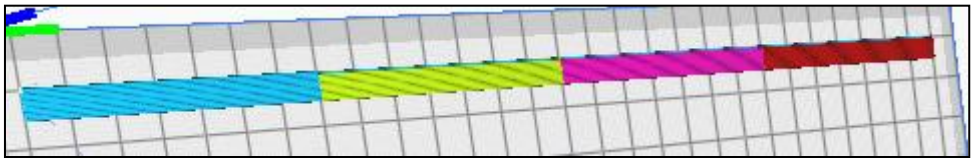
```
98 ;E3
99 T2
100 G92 E0
101 G1 E10 F900
102 G1 E20 F180
103 G92 E0
104 G1 X10 Y220 E7 F600
105 G1 X10.5 Y220 E7.5 F600
106 G1 X10.5 Y150 E14 F600
107 G1 X11 Y150 E14.5 F600
108 G1 X11 Y220 E21.5 F600
109 G1 X11.5 Y220 E22 F600
110 G1 X11.5 Y150 E29 F600
111 G1 X12 Y150 E29.5 F600
112 G1 X12 Y220 E36.5 F600
113 G1 X12.5 Y220 E37 F600
114 G1 X12.5 Y150 E46 F600
115 G1 X13 Y150 E46.5 F600
116 G1 X13 Y220 E53.5 F600
117 G1 X13.5 Y220 E54 F600
118 G1 X13.5 Y150 E61 F600
119 G1 X14 Y150 E61.5 F600
120 G1 X14 Y220 E68.5 F600
121 G1 X14.5 Y220 E69 F600
122 G1 X14.5 Y150 E76 F600
123 G1 X15 Y150 E76.5 F600
124 G1 X15 Y220 E83.5 F600
125 G1 X10 Y220 E84 F600
126 G92 E0
127 G1 E-5 F1800
128 G1 E-15 F180
129 G1 E-45 F900
```

E4

```
131 ;E4
132 T3
133 G92 E0
134 G1 E10 F900
135 G1 E20 F180
136 G92 E0
137 G1 X10 Y290 E7 F600
138 G1 X10.5 Y290 E7.5 F600
139 G1 X10.5 Y220 E14 F600
140 G1 X11 Y220 E14.5 F600
141 G1 X11 Y290 E21.5 F600
142 G1 X11.5 Y290 E22 F600
143 G1 X11.5 Y220 E29 F600
144 G1 X12 Y220 E29.5 F600
145 G1 X12 Y290 E36.5 F600
146 G1 X12.5 Y290 E37 F600
147 G1 X12.5 Y220 E46 F600
148 G1 X13 Y220 E46.5 F600
149 G1 X13 Y290 E53.5 F600
150 G1 X13.5 Y290 E54 F600
151 G1 X13.5 Y220 E61 F600
152 G1 X14 Y220 E61.5 F600
153 G1 X14 Y290 E68.5 F600
154 G1 X14.5 Y290 E69 F600
155 G1 X14.5 Y220 E76 F600
156 G1 X15 Y220 E76.5 F600
157 G1 X15 Y290 E83.5 F600
158 G1 X10 Y290 E84 F600
159 G92 E0
160 G1 E-5 F1800
161 G1 E-15 F180
162 G1 E-45 F900
```

The above code is added to check whether the filaments are loaded correctly and can be switched correctly.

You can delet the lines if you haven't used that extruder too.



Prime gcode will generate the print result as above

zonestar

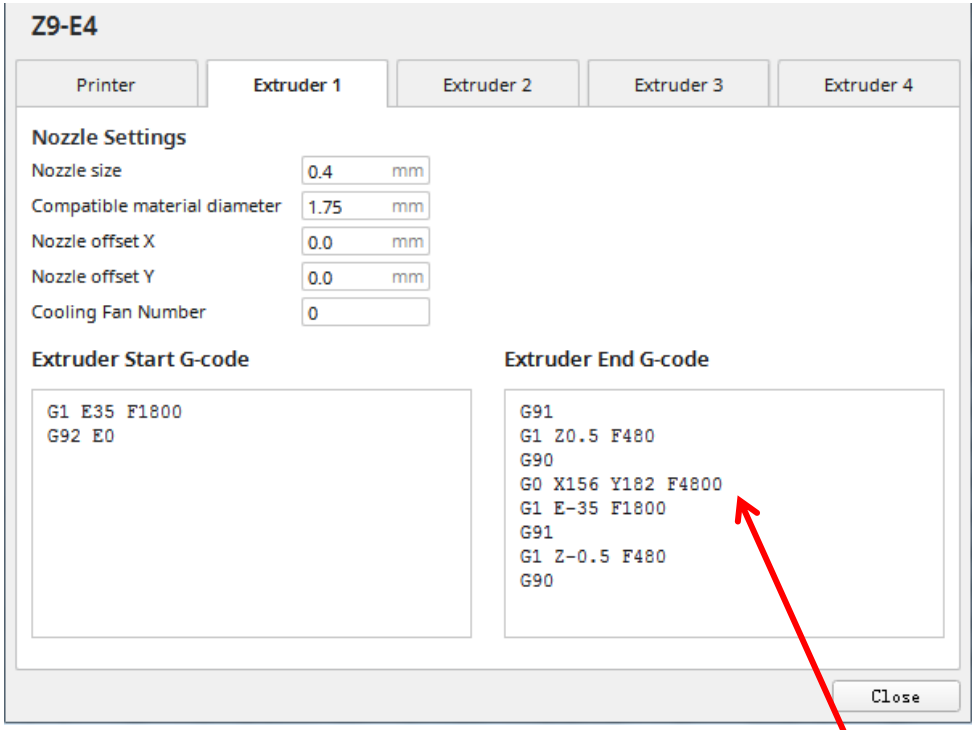
Setting up printer - endgcode

3: We store the start gcode in the “E4 end gcode.txt” file, please open it and copy the content and pase into the above window of cura (“end g-code”).

```
;==========================================
;start of "end gcode"
M140 S0
;Retract the filament
G92 E0
G1 E-5 F1800
G1 E-35 F900
G28 YX
M104 S0
M84
;end of "end gcode"
;==========================================
```

Setting up printer - extruder gcode

4: set the settings of Extruder 1 ~ Extruder 4 as the below picture, all of these 4 extruders are the same.



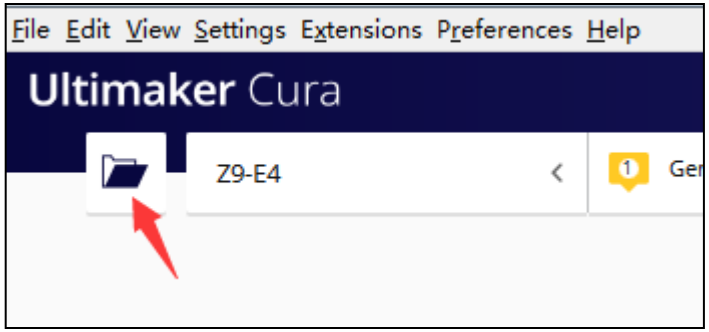
NOTE: you need to change the nozzle parking position when switching the extruder, about the detail, please refer to ***page 14***

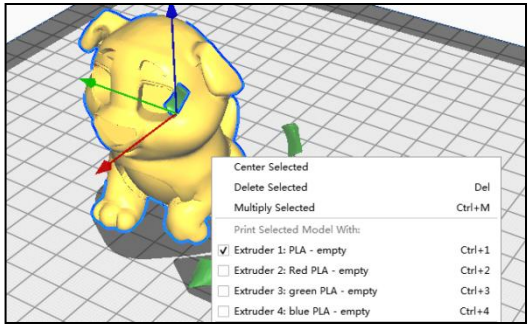
X= Prime X postion - Prime Tower Size/s

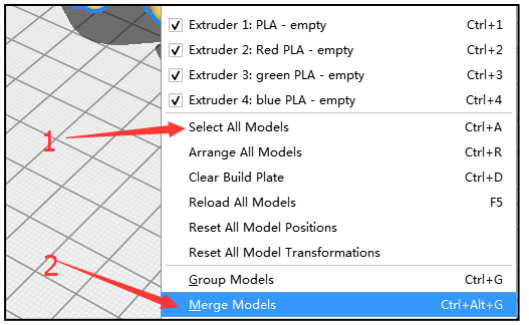
Y= Prime Y postion + Prime Tower Size/s

G0 X156 Y182 F4800

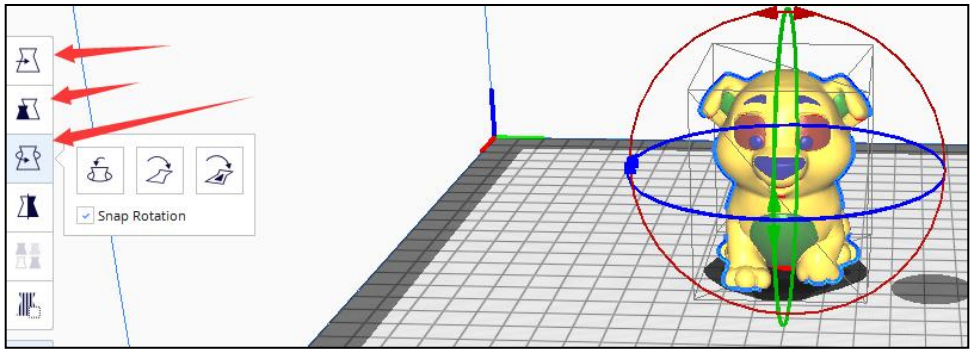
5: Slicing

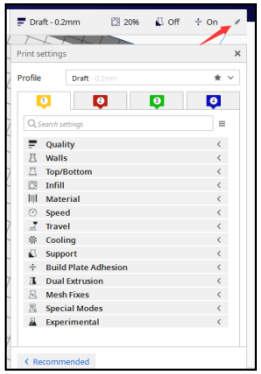






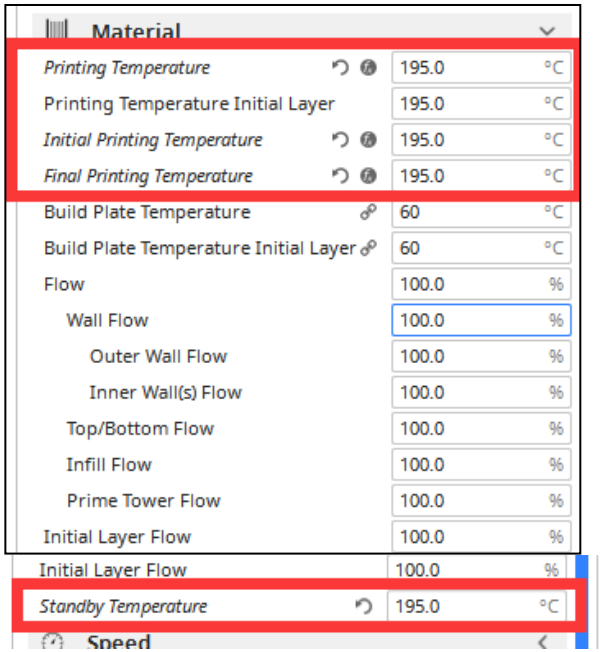
Open stl files → assign extruders → Merga the stl files

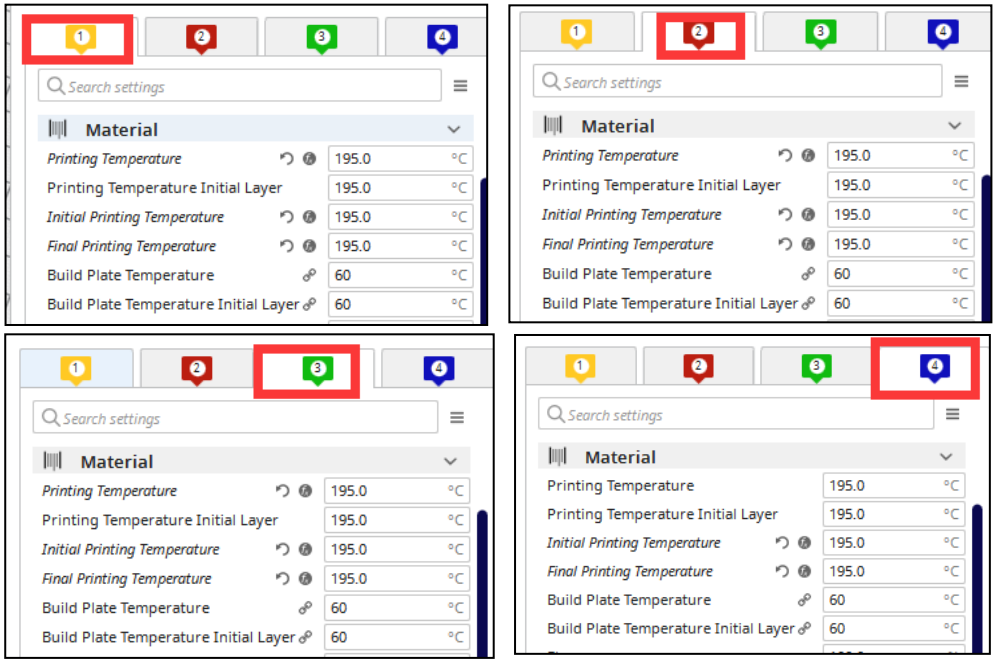




Rotate/ZOOM/Move if need → **Set slicing settings**

Temperature



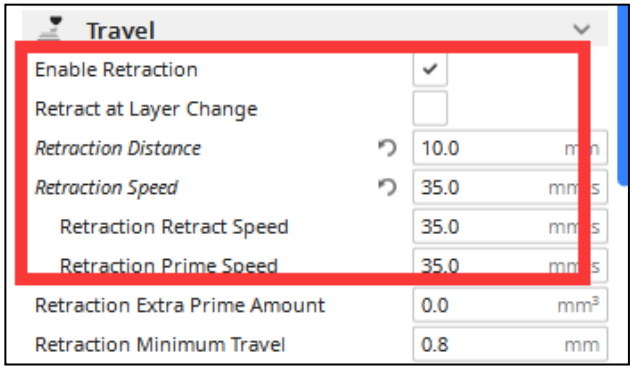


All of these settings must be the same value, and all of the extruders must be the same too

Print temperature = Print temperature initlial layer = initial printing temperature = final printing temperature = standby temperature

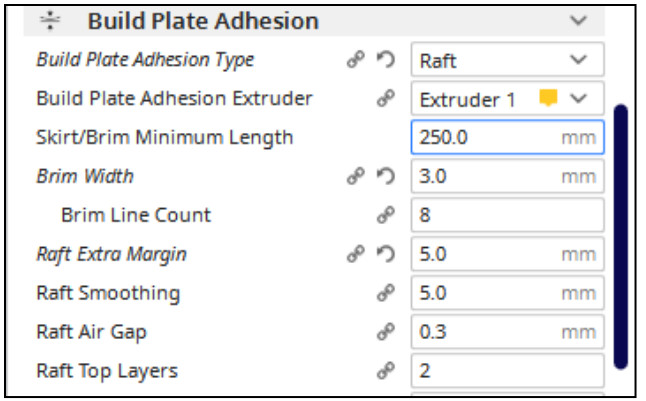
slicing

Retraction



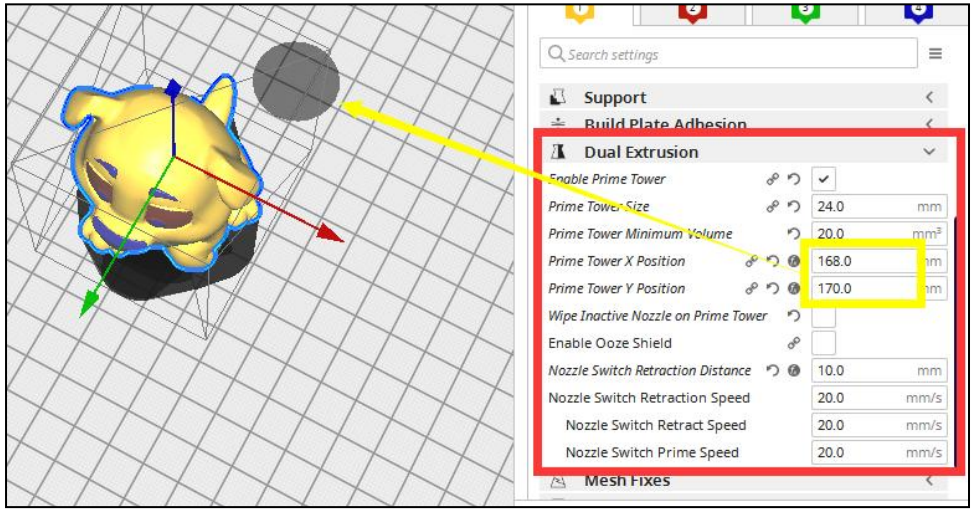
All of these settings must be the same value for all of the extruders

Raft

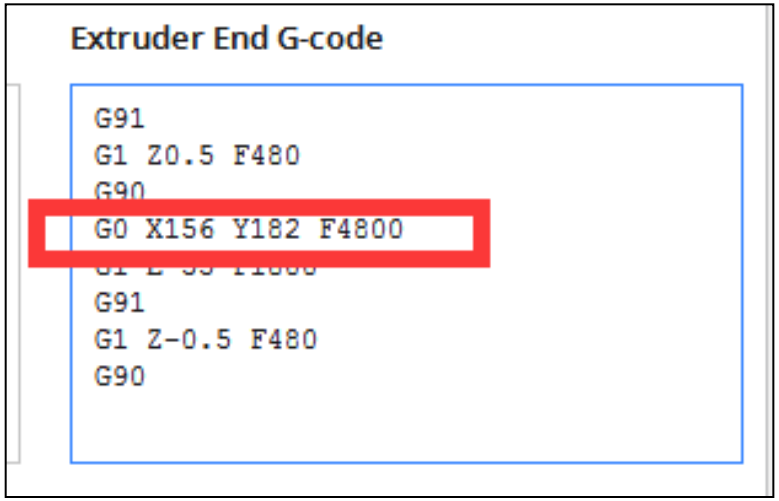


It's recommend to add a raft

Prime tower



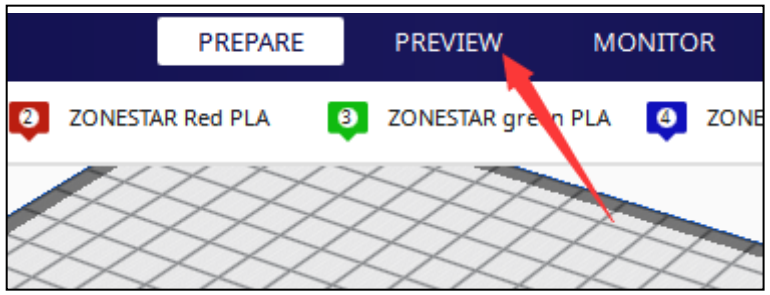
You need to set the X and Y position of tower to prevent it overlapping with the prints

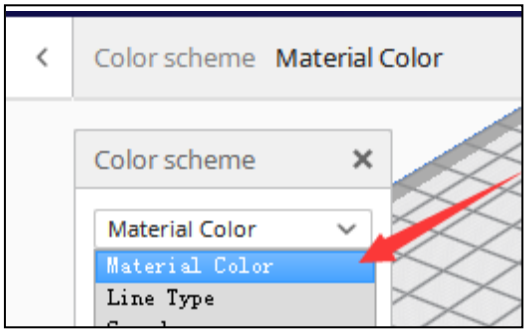


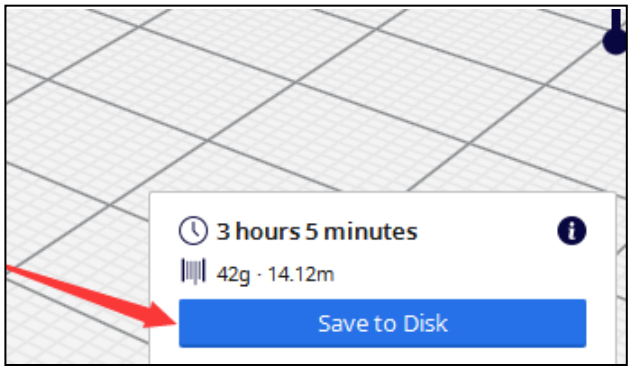
X= 168 - 24/2 = 156

Y= 170 + 24/2 = 182

slicing

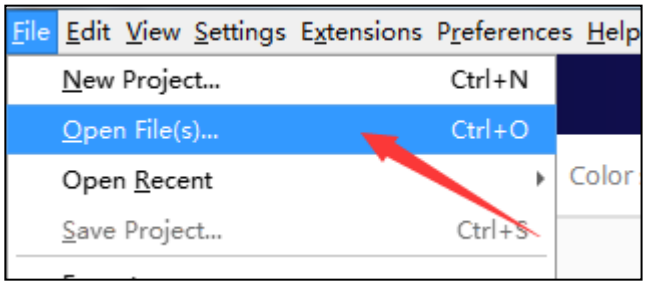


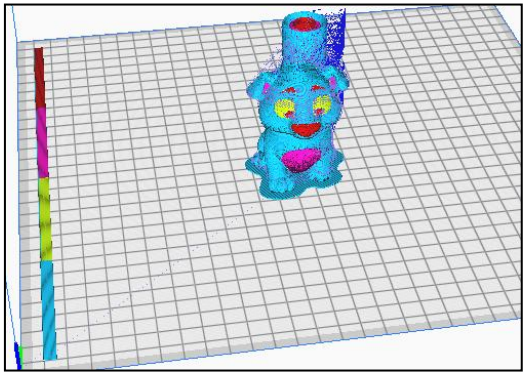




Slicing and preview the gcode

Store to PC





Suggest to open the gcode file and preview it to see the final result before print it

Copy the stl file into the SD card and printing it

Notice

- **Don't need to add start gcode When printing one color.**

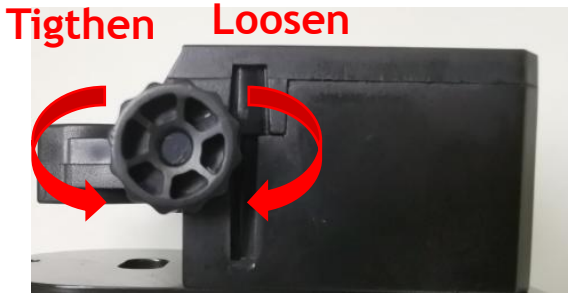
  Use Cura's default start gcode, also no need to use a color switching tower.

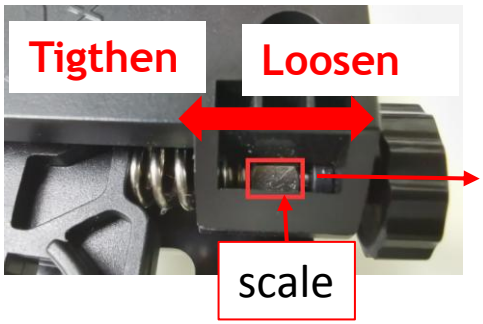
- **You will hear the “Kaka” noise from the extruder motor while pre-loading filament when printing multi-color.**

  In order to ensure the filament are pre-loaded to hotend properly, we “over-load” the filament in the addtion start gcode. it is normal and you don't worry about it.

- **Pay attention to adjust the extrusion pressure of the extruder.**

  If the extruder motor can not feed or pull out the filament well when switching the filament, the printing may fail. So you need to adjust the extrusion pressure according to the hardness of the filament, several examples for your reference as below.





The filament is harder, the extruder should be tightener