JGAURORA 3D Printer
Model:Z-603S

Operation Instruction

CONTENTS

INTRODUCTION

Z- 603S model is designed FDM 3d printer by Shenzhen Aurora Technology Co., Ltd, which could print the plastic models that you drawn.

characteristics: CNC laser cutting Metal body, transmit by belt and screw rod ,linear bear in X-Y-Z axis,which construction make printing much more table and high precision with less shake.

Special note:
1. All content in this manual is strictly checked, if any printing errors

   or misunderstandings on the content, Shenzhen Aurora reserves

   the rights of interpretation.

2. Any update information, will not notify.

A,Security Considerations

🚫Do not touch the extruder and hot bed, when machine working, temp. of extruder will be about 200 centigrade, hot bed could be 110 centigrade.

🚫Do not put your hand into machine when printing, in case of crushing.

🚫The power supply use 110V-220V~50HZ alternating current, the tripod socket must be grounded, don't add another power, in case of fire or electric shock.

⚠️We suggest you wear safety goggles when tear off supports of models.

⚠️Put the machine at a drafty room, some smells from the material may let you uncomfortable, especially ABS material.

B.PRODUCT DETAILS

1.Specifications

|	
Model：Z-603S	Nozzle diameter： 0.4mm
Layer thickness：0.1-0.3mm	Machine size： 480*365*410mm
Printing speed：10-300mm/s	Machine weight：17KG
XY axis position accuracy：0.05mm	Packing size：580*460*510mm
Z axis position accuracy：0.015mm	Gross weight：20KG
Printing material：ABS,PLA,TPU,PA	Build size：280*180*180mm
Material tendency：PLA	LCD screen：Yes
Filament diameter ：1.75mm	Offline printing：USB
Software language：Multi-Language	File format：STL、G-Code、OBJ
Function of support：automatically	OS：windows(linux、mac)
Software： Cura	Working condition：10-30℃，Humidity 20-50%

2.Name of machine parts

Pic. 1
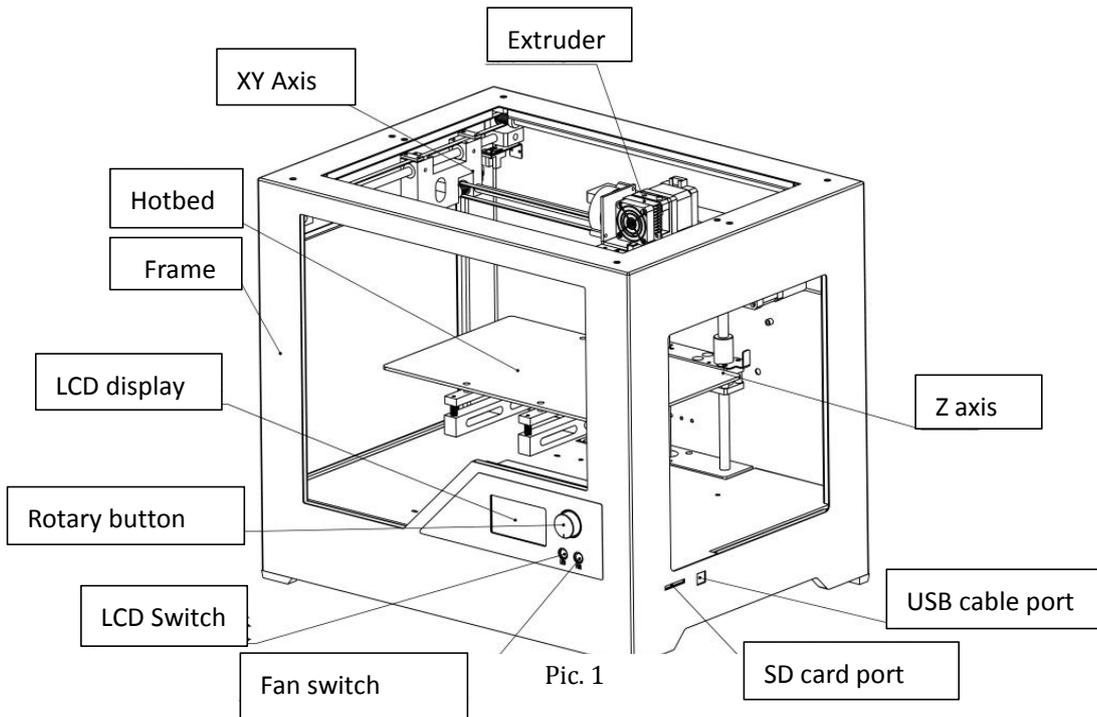
3.Extruder drawing
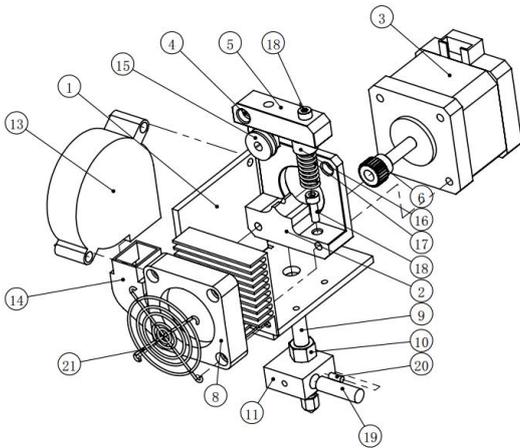
Pic. 2
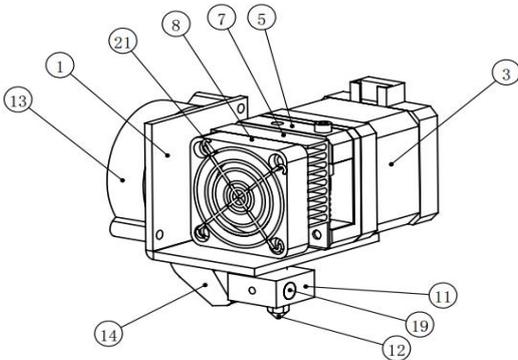
Item No.	Name	Quantity
1	Extruder installation board	1
2	Extruder motor base	1
3	Stepper motor 40	1
4	Spindle	1
5	Extruder pressing block	1
6	Extruder gear 26*0.4mm	1
7	Heatsink	1
8	Fan 24v	1
9	M6*30 venturi with teflon	1
10	C grade M6 hexagon nuts	1
11	Heating block	1
12	Brass nozzle	1
13	Blower fan 24V	1
14	Tuyere	1
15	U shape bearing 604UU	1
16	M6*10 hexagon socket cap screws	1
17	Φ8*Φ1*31 spring	1
18	Hexagon socket cap srews M6*10	2
19	K galvanic couple	1
20	Themistor	1
21	Fan casing	1

Pic.3

4.Tool list

Photo	Name	Quantity	Unit
	Filament holder	1	pc
	testing filament	1	pc
	Nozzle cleaning needle	1	pc
	Hexagon wrench	1	pc
	8'and 10'wrench	1	pc
	Micro diagonal nippers	1	pc
	USB cable	1	pc
	Power supply cable	1	pc
	8G SD card	1	pc
	some screws	some	pc
	Card reader	1	pc

Pic. 4

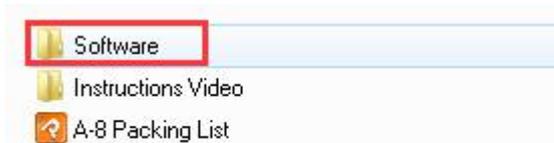# C.CURA SOFTWARE

1、Cura14.07 installation

a.Where can I find the software ?

1).SD card with shipment ; 2).download from internet；

b.installation process
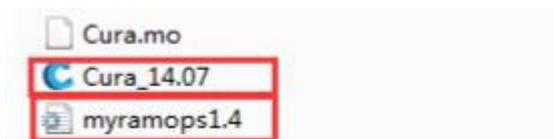
1).From SD card with shipment

Insert SD card and open the file

Pic. 5

Pic. 6

Pic. 7

2).Download from internet

Official website：https://ultimaker.com/en/cura-software/list

Select the right version as per your company system

WINDOWS

Version: 15.06.01	Release date: 7/2/15
Version: 15.06.00	Release date: 7/1/15
Version: 15.04	Release date: 4/15/15
Version: 15.02.1	Release date: 2/19/15
Version: 15.01	Release date: 1/30/15
Version: 14.12	Release date: 12/15/14
Version: 14.09	Release date: 9/19/14
Version: 14.07	Release date: 7/3/14
Version: 14.06	Release date: 6/16/14
Version: 14.03	Release date: 3/17/14
Version: 14.01	Release date: 1/10/14
Version: 13.12	Release date: 12/23/13
Version: 13.11	Release date: 11/22/13

Pic. 8

b.Software installation process

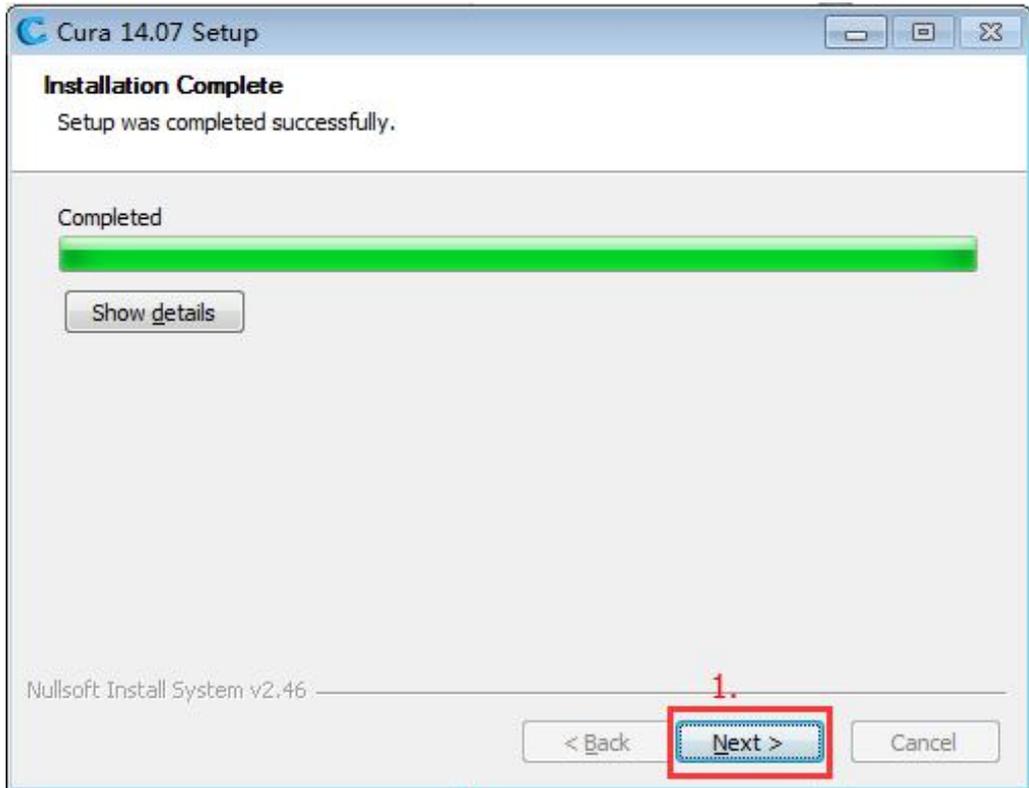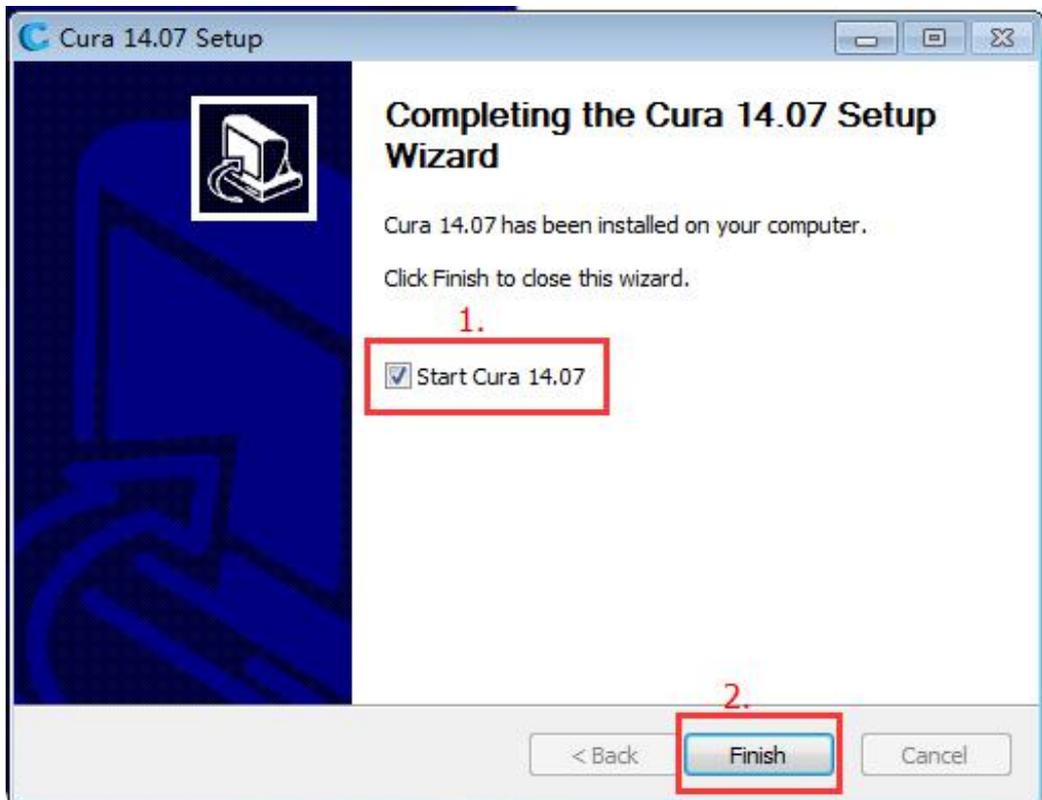Double click **C Cura_14.0'** and follow the steps to install it
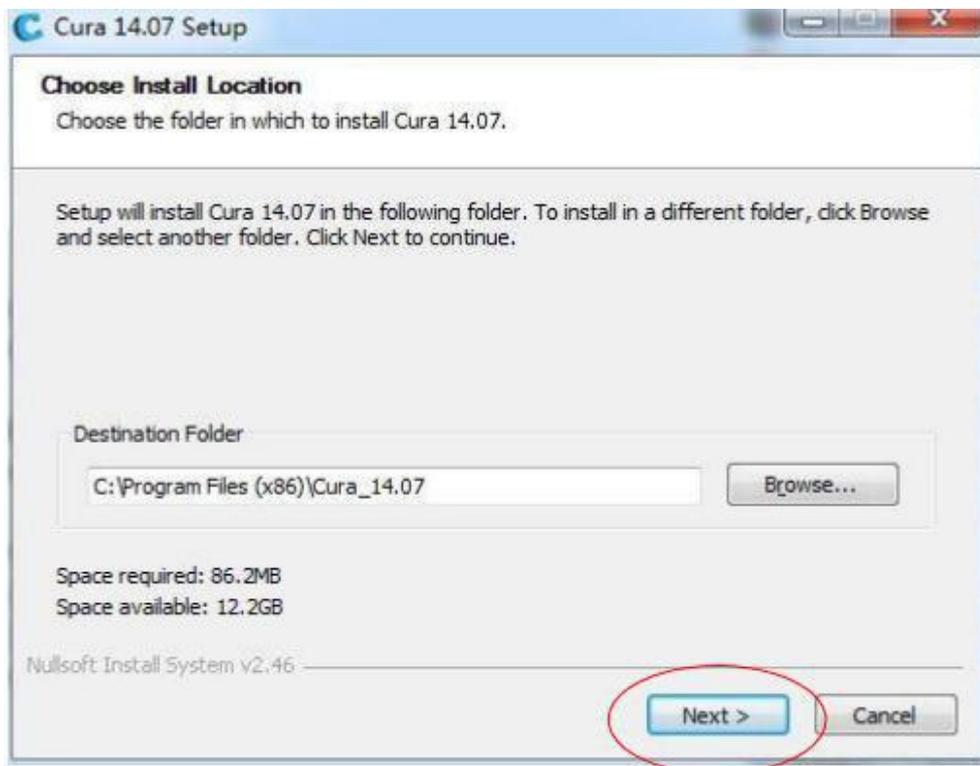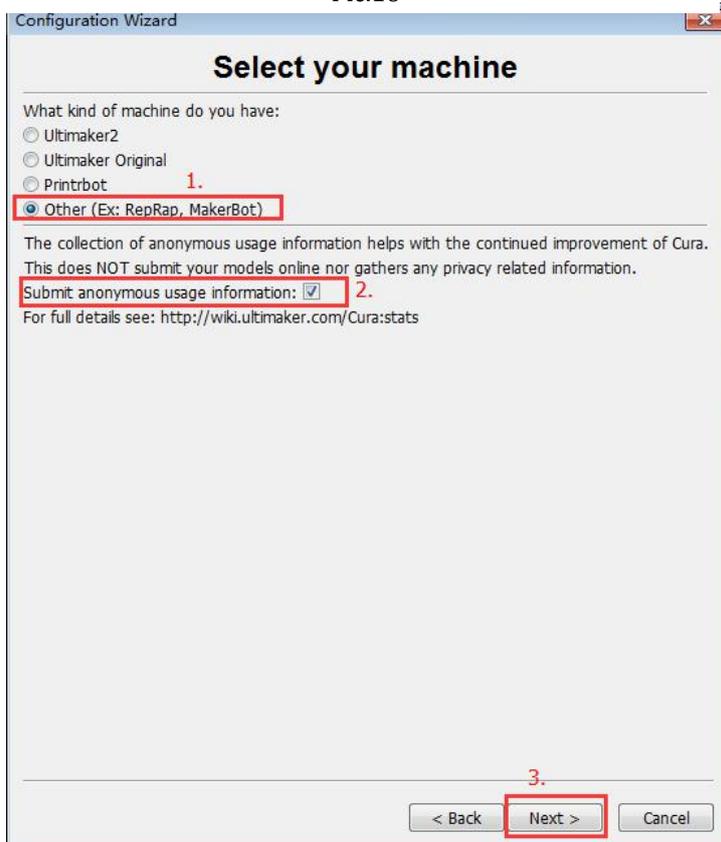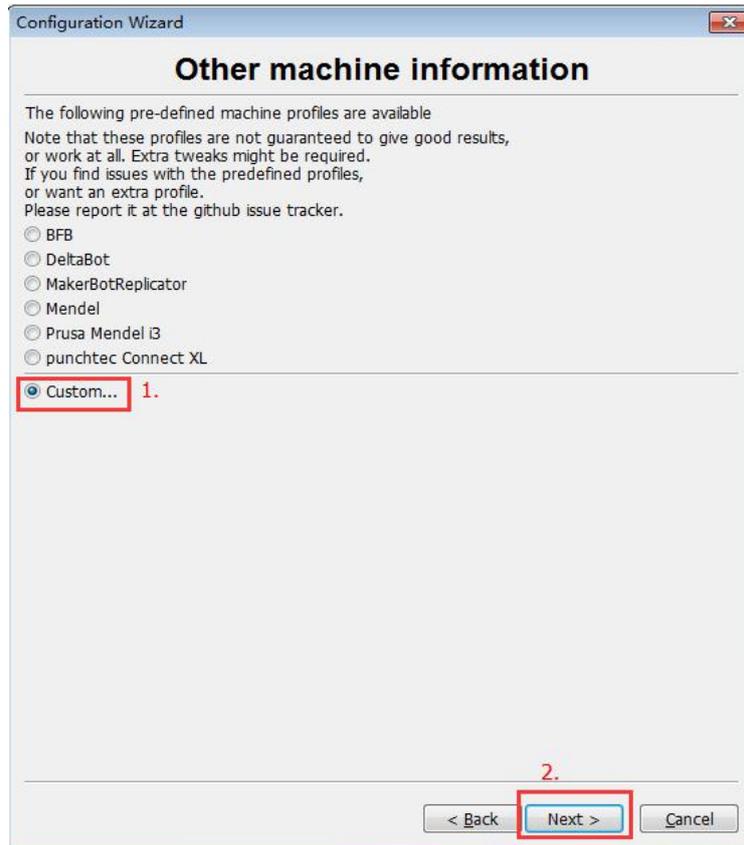

Pic.9
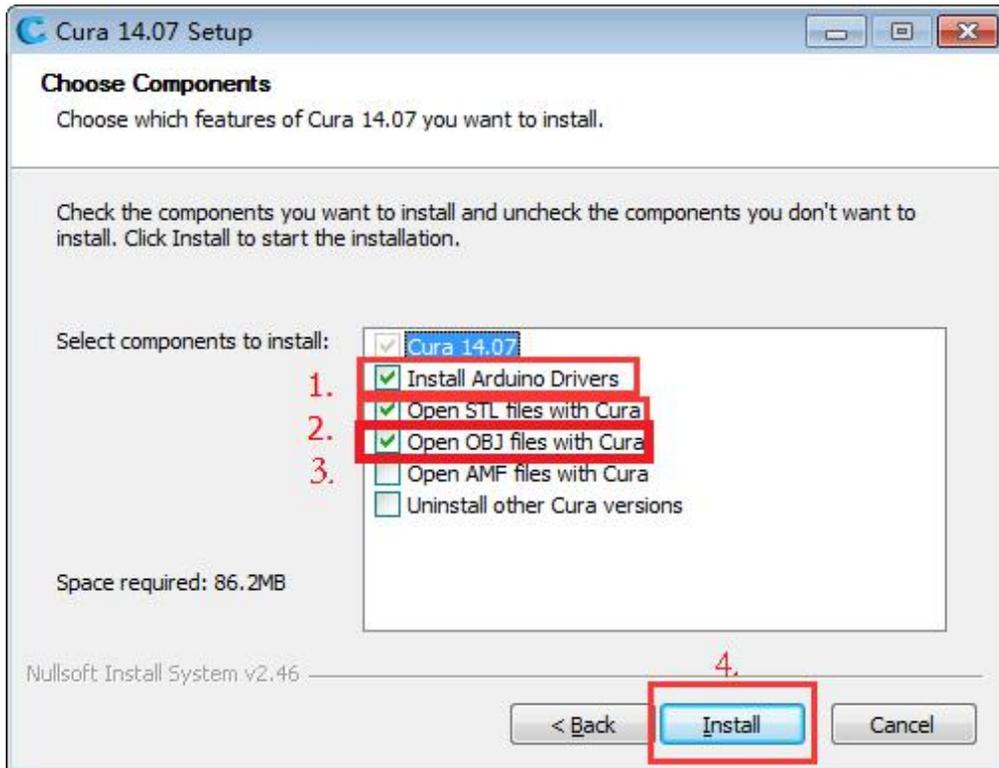
Pic.10
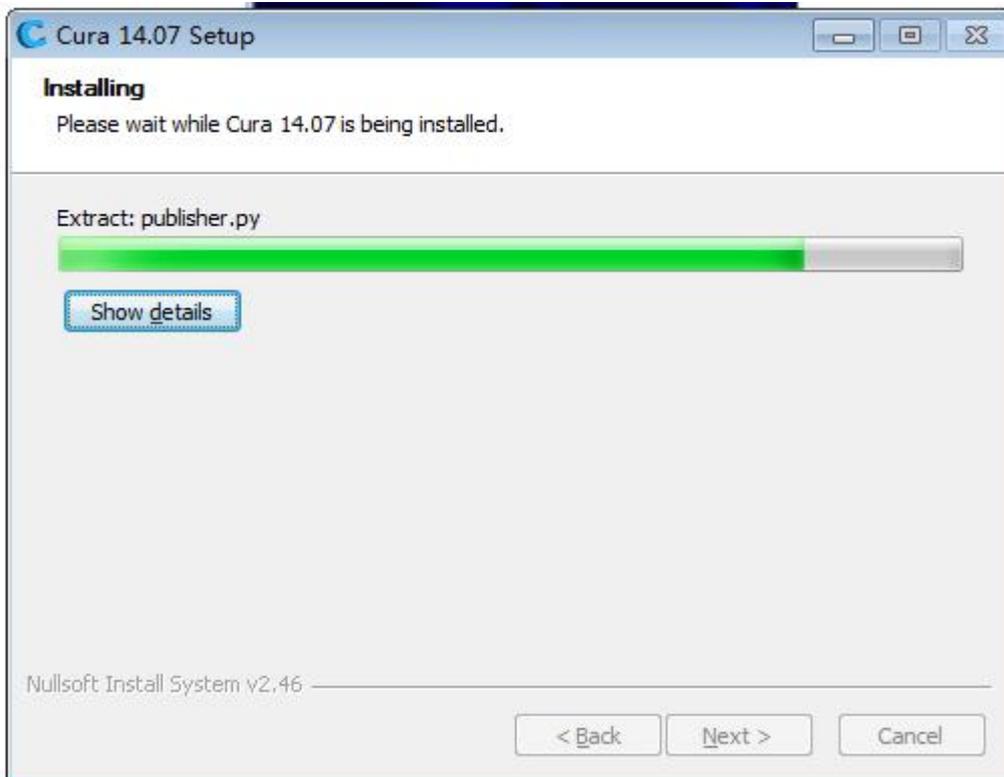
Pic.11

Pic.12

Pic.13

Pic.14

Pic.15

Pic.16
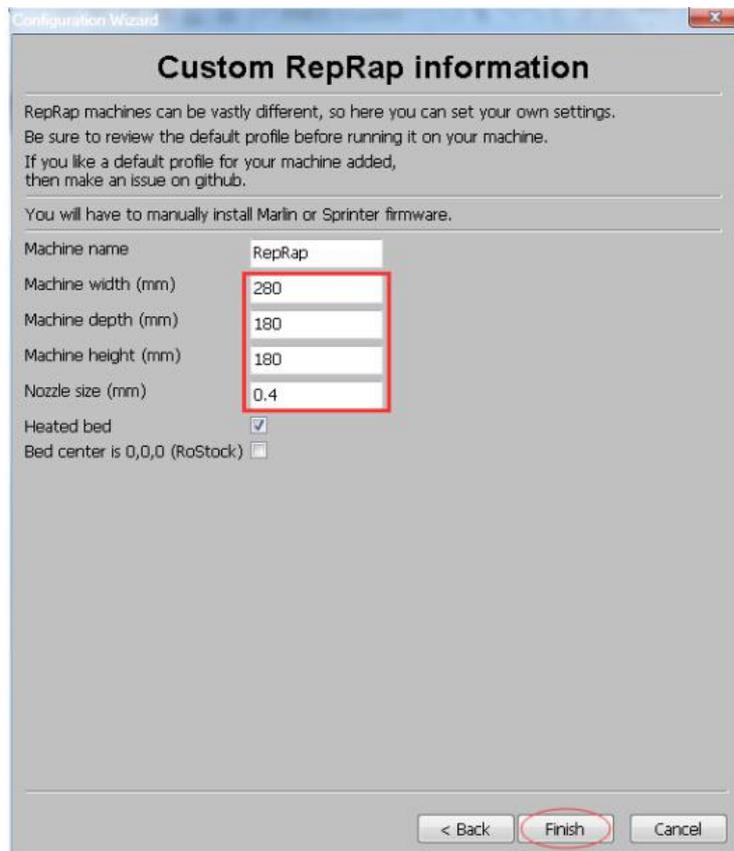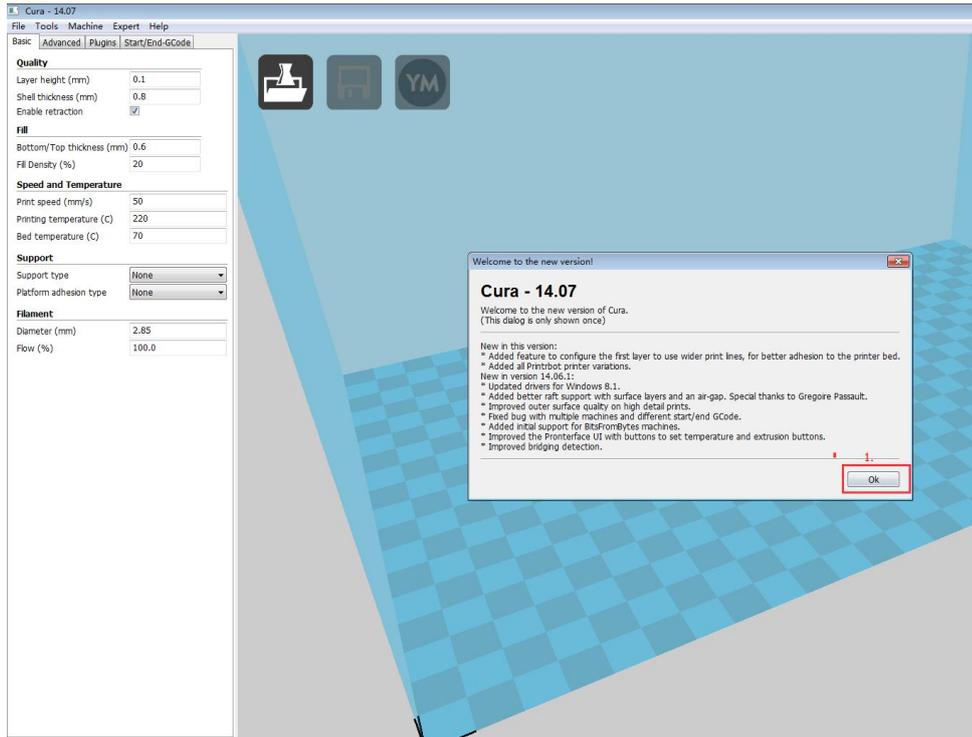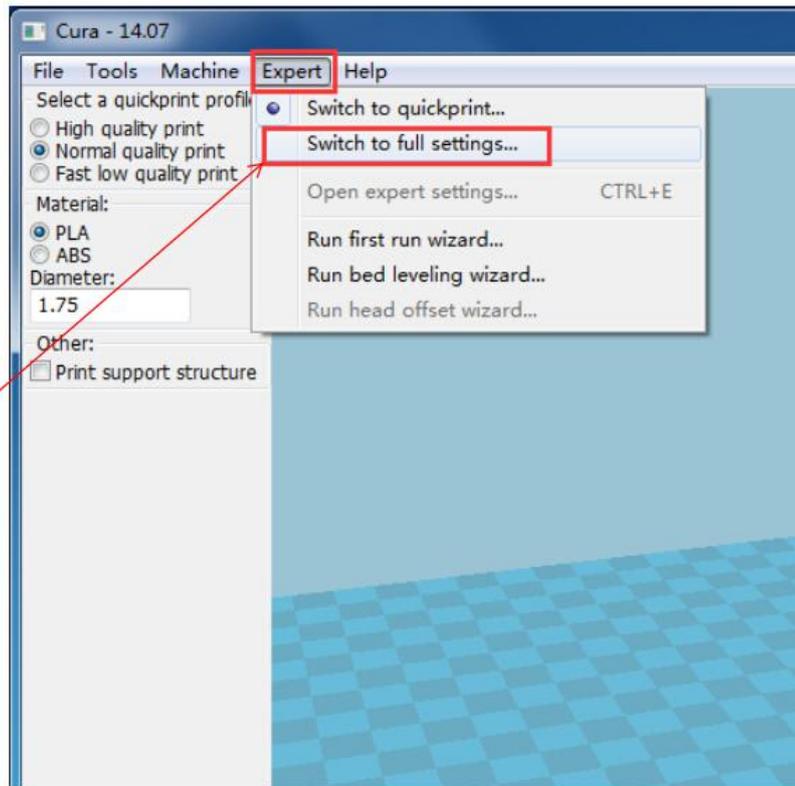

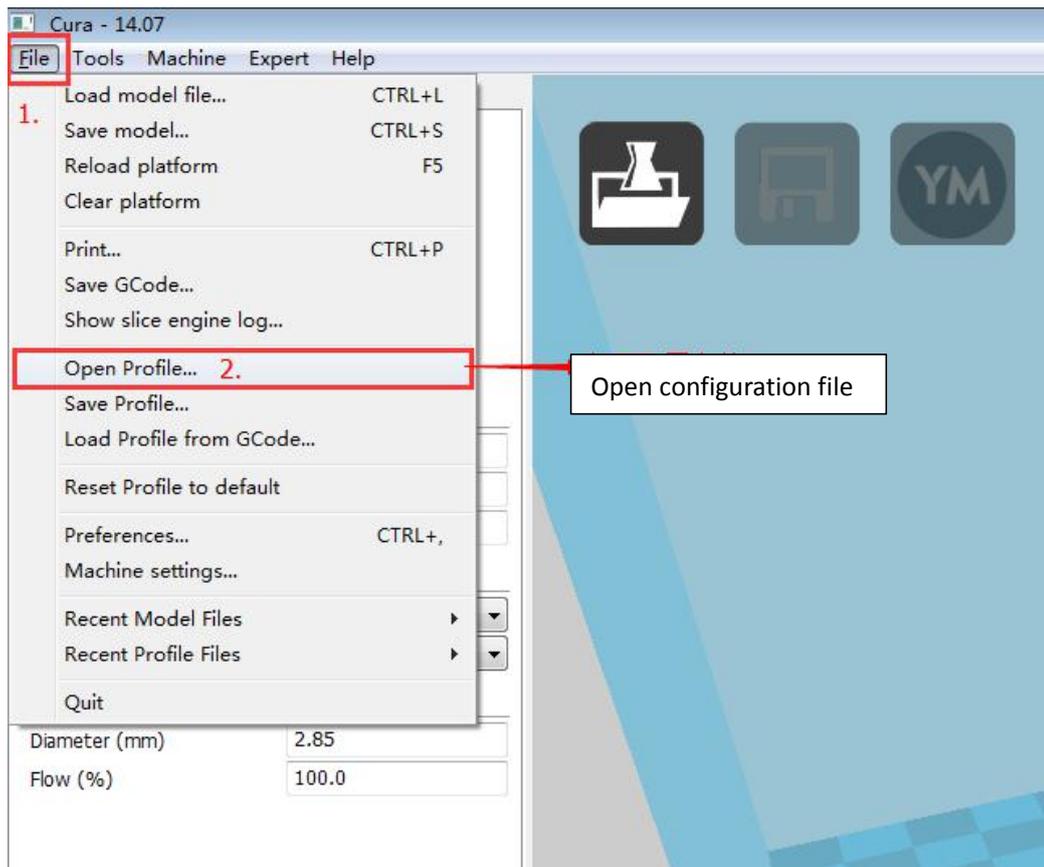Pic.17

Pic.18

Pic.19

Max build size

Click OK

Pic. 20

Switch to full settings for parameter setting.
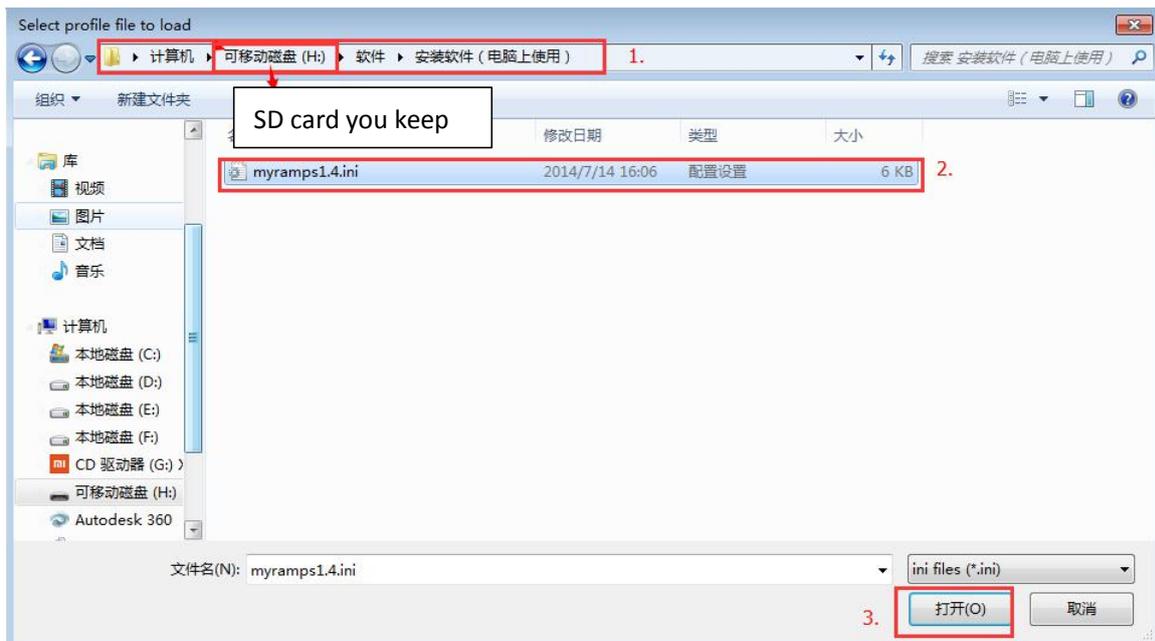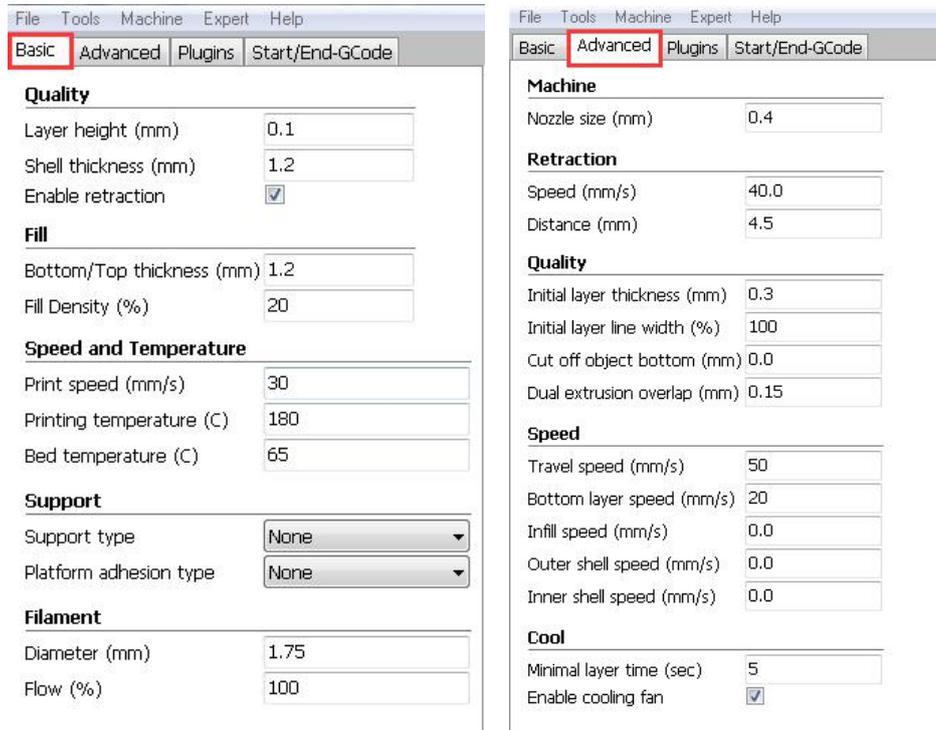
Pic.21

Configurations loading as per below 1->2 step

Pic. 22

Position of configuration file：Computer/SD card)/Software/installation file/myamps1.4.ini
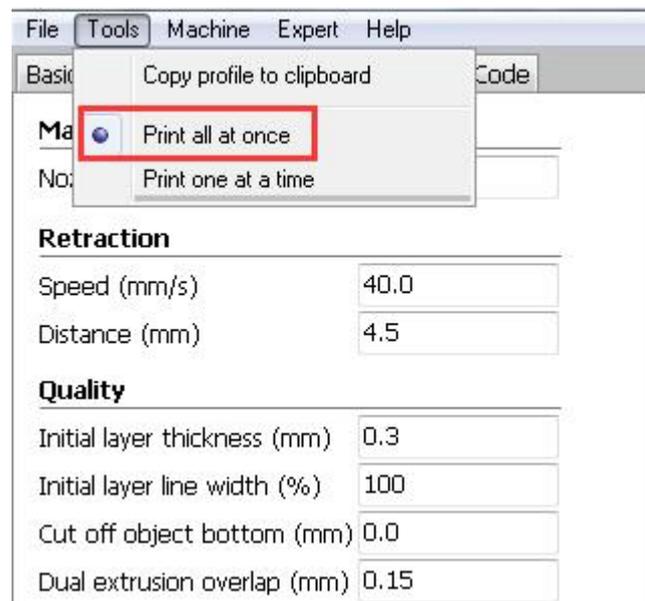（suggestion :keep this file copy to your computer）

Pic. 23

After Loading, the basic and advanced configuration will be changed to the

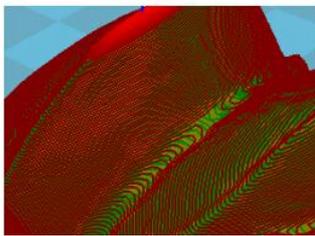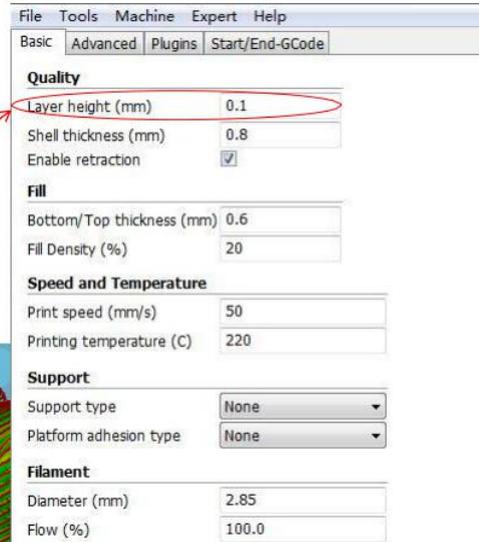Z-603S regular printing configuration.

Pic.24
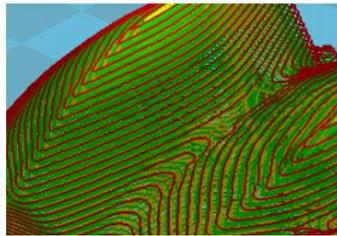
Set " print all at once".

Pic.25

2.Cura software setting

Layer height setting

When set layer height at 0.1mm,print time is longer and higher print precision.Print time will be shorten half when setted at 0.2mm comparing 0.1mm lay height, and prcesion is also good.The shortest time but not good precision is at 0.3mm.
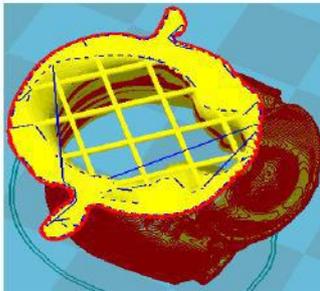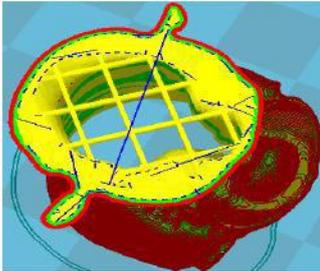
left:0.1mm
layer height

Right:0.3mm
layer height

Pic. 26

Shell thickness

0.4

0.8

1.2
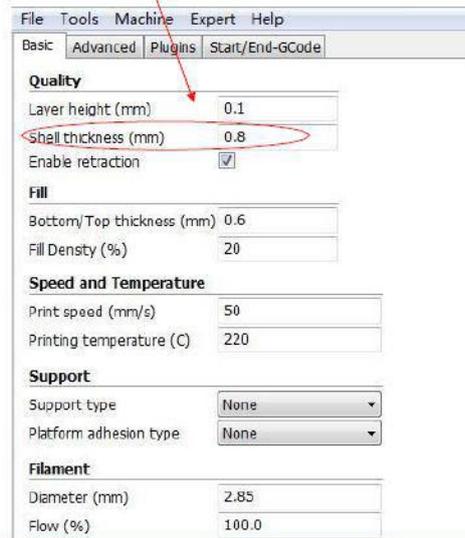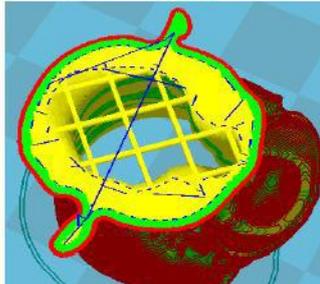
1. Shell will be very thin when set shell thickness at 0.4mm.
2. Print time will be longer when shell thickness at 1.2mm.
3. Normally, it is best at 0.8mm.
4. Shell thickness should be the integral multiple of the nozzle diameter.

Pic. 27

Enable retraction function: not to let the fused filament leak off under force of gravity during printing moving. Otherwise, the apperance of printed sample will be effected.
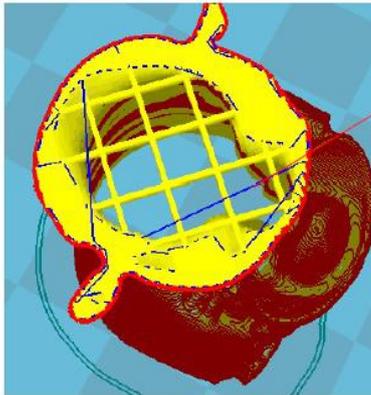
Blue stand for the thread leaked out.

pic. 28

When the fill density less 20% , there will be a hole at the top when thickness at 0.6mm.Normally,1.2mm is better.
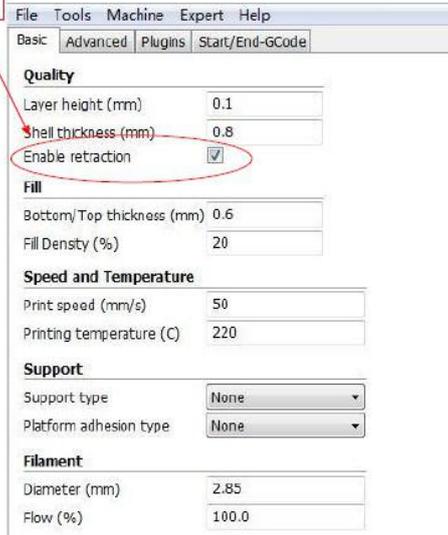
Same filling

Bottom/Top thickness: 1.2mm

Bottom/Top thickness: 0.6mm

Pic. 29

Fill density: 10% is OK if no strength requirement.
Increase the fill density if high strength requirement, but printing time increased accordingly, and will print accumulation in slop.

20%

50%

90%

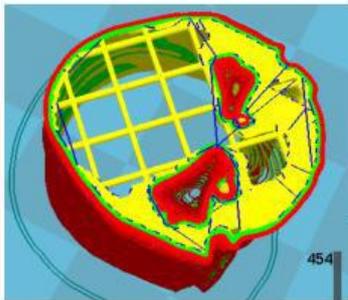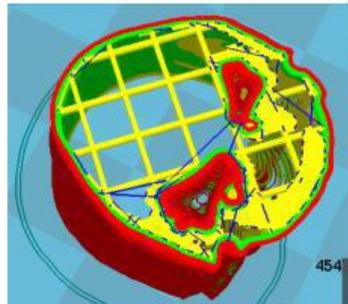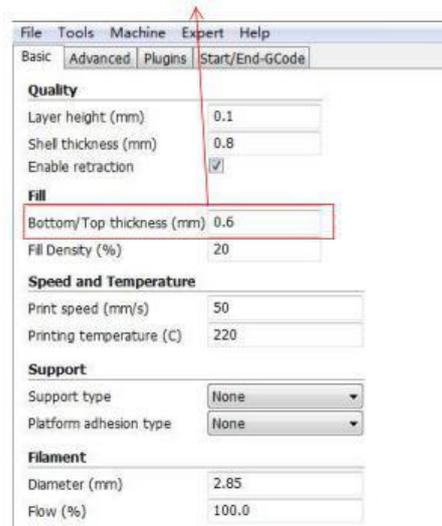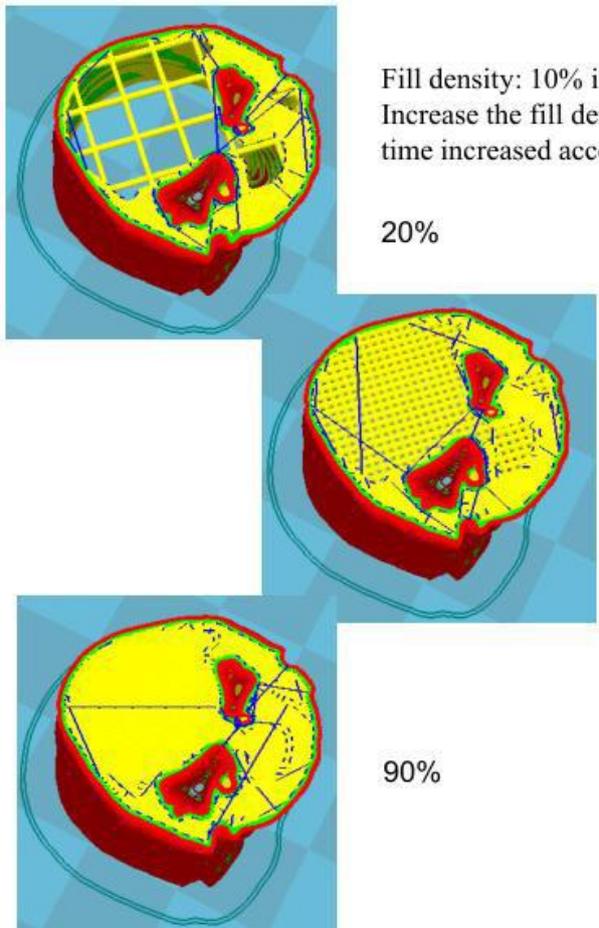| Quality	
Layer height (mm)	0.1
Shell thickness (mm)	0.8
Enable retraction	☑
Fill	
Bottom/Top thickness (mm)	0.6
Fill Density (%)	10
Speed and Temperature	
Print speed (mm/s)	50
Printing temperature (C)	220
Support	
Support type	None
Platform adhesion type	None
Filament	
Diameter (mm)	2.85
Flow (%)	100.0

Pic. 30

Speed and temperature setting

This speed is initial configuration file loaded. You could alter the speed you want to print. Speed is inversely proportional to accuracy. Normally, we suggest at 40-60mm/s.

PLA:
Nozzle: 190-220
Hot bed: 50-80
ABS:
Nozzle: 245-255
Hot bed: 90-100
Speed faster, layer height more, temperature should be set higher. On the contrary, temperature could be set lower.

Quality	
Layer height (mm)	0.1
Shell thickness (mm)	0.8
Enable retraction	☑
Fill	
Bottom/Top thickness (mm)	1.2
Fill Density (%)	50
Speed and Temperature	
Print speed (mm/s)	30
Printing temperature (C)	200
Bed temperature (C)	50
Support	
Support type	None
Platform adhesion type	None
Filament	
Diameter (mm)	1.75
Flow (%)	100

Pic. 31
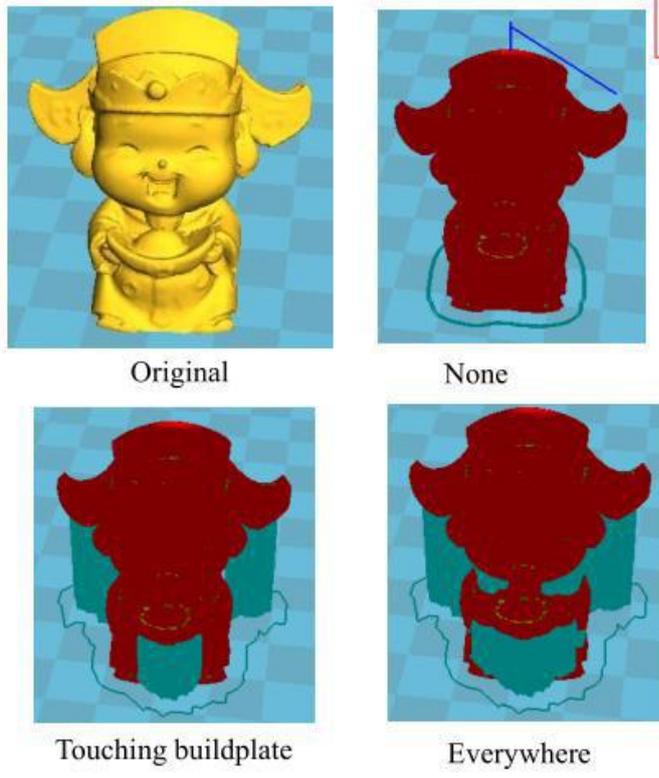
Support type: None, Touching buildplate and Everywhere.

Original

None

Touching buildplate

Everywhere
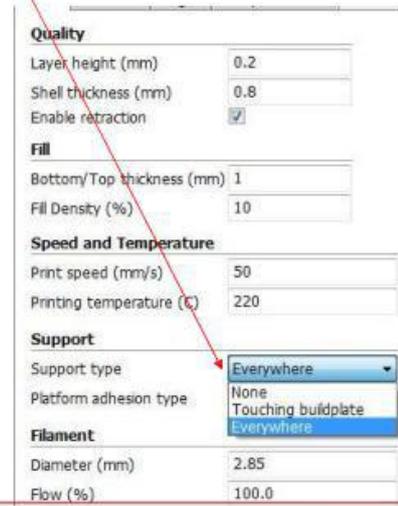
Support setting

Normally support is needed for complicated structure and hangling model, Everywhere type may touch the model and not good looking apperance,To avoid support,model need to be rotated to a right position.

Pic.32

Platform adhesion setting
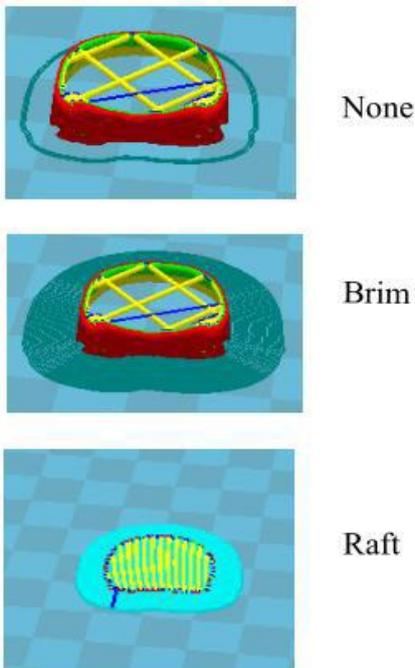
None

Brim

Raft

Platform adhesion type: None,Brim and Raft
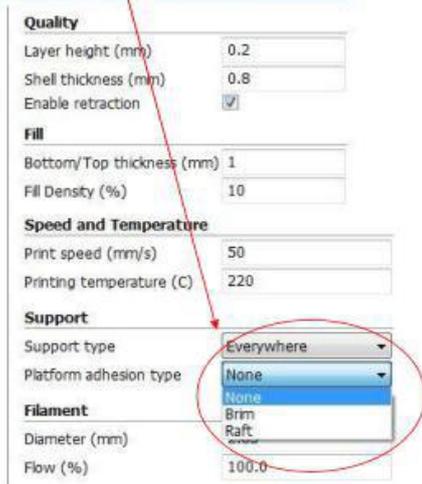
For normal models, select "None" is OK if hot bed adjustment done and good blue masking tap. Or, slect Raft, but hard to seperate raft from model.

Pic .33

Filament setting

2.85mm is auto for Cura system,1.75mm is our machine standard.

Flow rate, increasing the flow rate is as same as decreasing the filament diameter. Increasing too much,there will be salient point in model appearance, decreasing too much, model will be sparse cause of few filament flow.
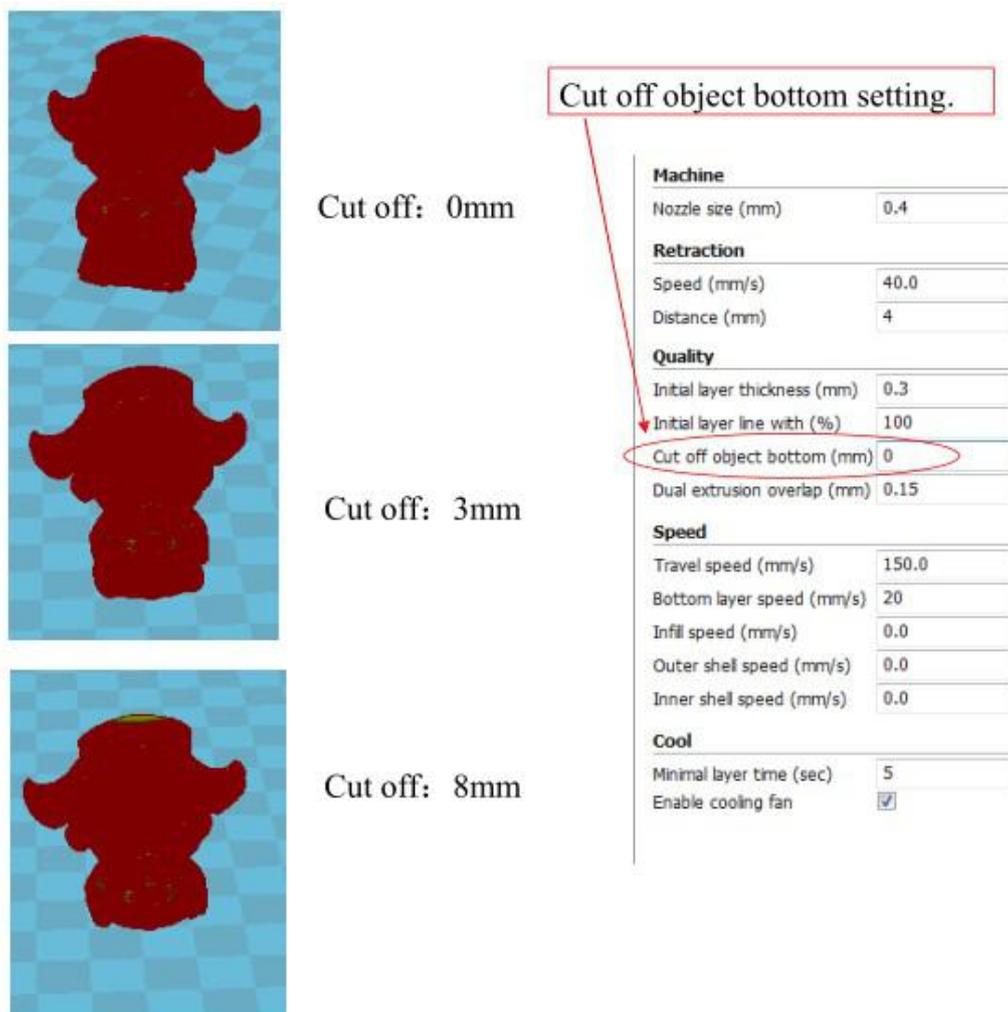
Quality	
Layer height (mm)	0.2
Shell thickness (mm)	0.8
Enable retraction	✔
Fill	
Bottom/Top thickness (mm)	1
Fill Density (%)	10
Speed and Temperature	
Print speed (mm/s)	50
Printing temperature (C)	220
Support	
Support type	Everywhere
Platform adhesion type	Raft
Filament	
Diameter (mm)	2.85
Flow (%)	100.0

Pic 34

Fixed value don't need to change after configuration File loading.

Basic	Advanced	Plugins	Start/End-GCode

Machine	
Nozzle size (mm)	0.4
Retraction	
Speed (mm/s)	40.0
Distance (mm)	4
Quality	
Initial layer thickness (mm)	0.3
Initial layer line with (%)	100
Cut off object bottom (mm)	0.0
Dual extrusion overlap (mm)	0.15
Speed	
Travel speed (mm/s)	150.0
Bottom layer speed (mm/s)	20
Infill speed (mm/s)	0.0
Outer shell speed (mm/s)	0.0
Inner shell speed (mm/s)	0.0
Cool	
Minimal layer time (sec)	5
Enable cooling fan	✔

Cooling fan

Pic. 35

- 20 -

Cut off object bottom setting.

Cut off: 0mm

Cut off: 3mm

Cut off: 8mm

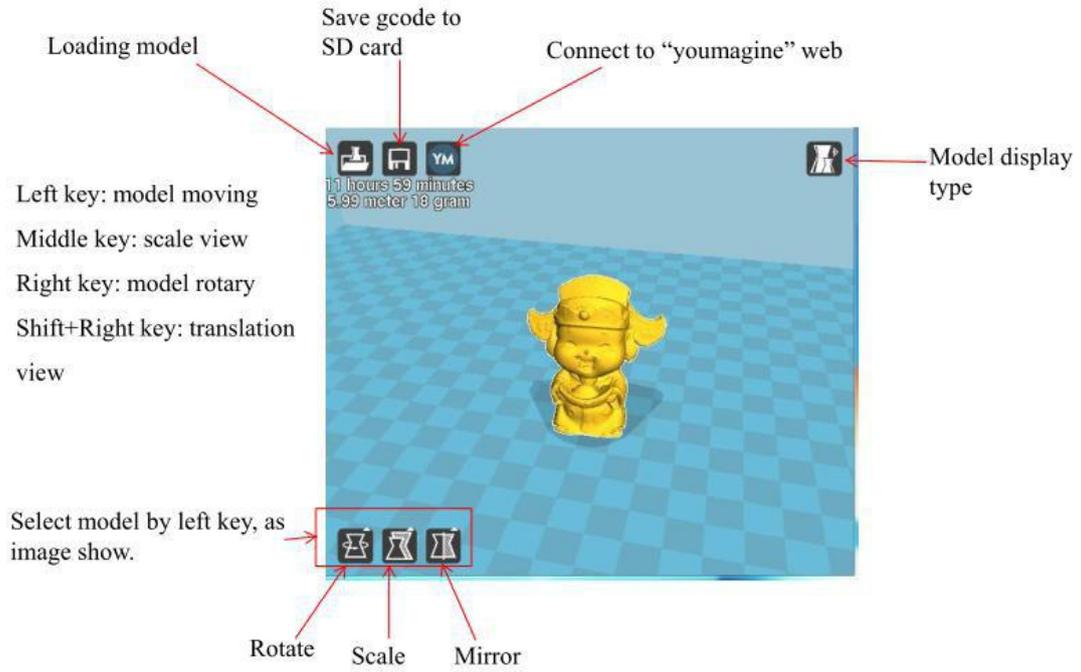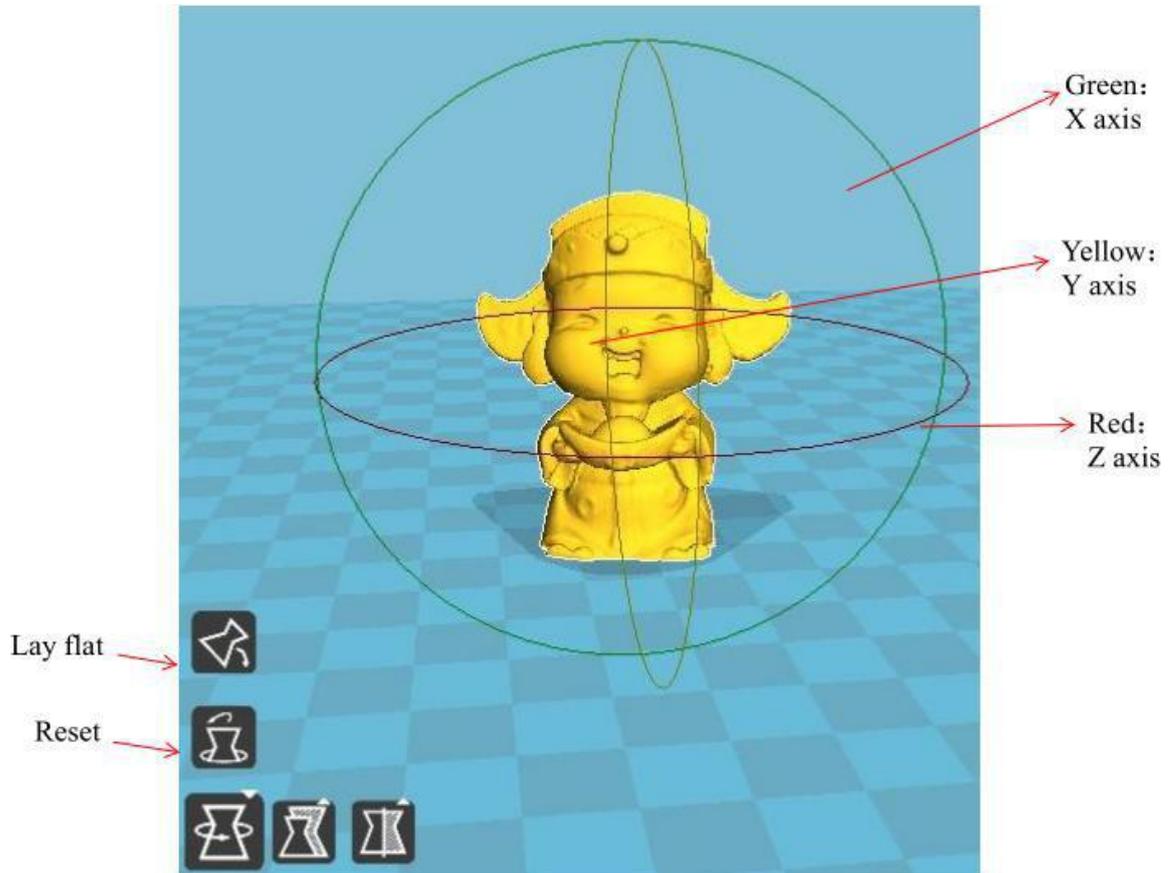| Machine	
Nozzle size (mm)	0.4
Retraction	
Speed (mm/s)	40.0
Distance (mm)	4
Quality	
Initial layer thickness (mm)	0.3
Initial layer line with (%)	100
Cut off object bottom (mm)	0
Dual extrusion overlap (mm)	0.15
Speed	
Travel speed (mm/s)	150.0
Bottom layer speed (mm/s)	20
Infill speed (mm/s)	0.0
Outer shell speed (mm/s)	0.0
Inner shell speed (mm/s)	0.0
Cool	
Minimal layer time (sec)	5
Enable cooling fan	☑

Pic. 36

Different firmware have its own customized order,
normally, don't change for these two items.

Pic. 37

- 21 -
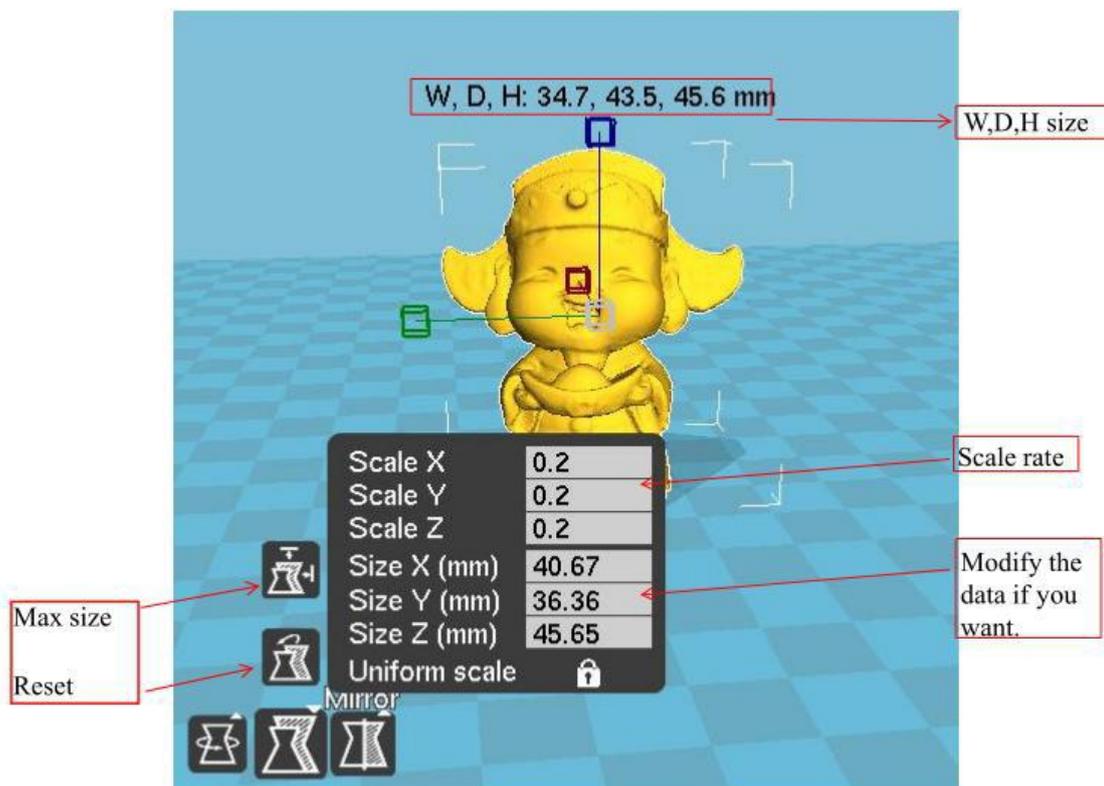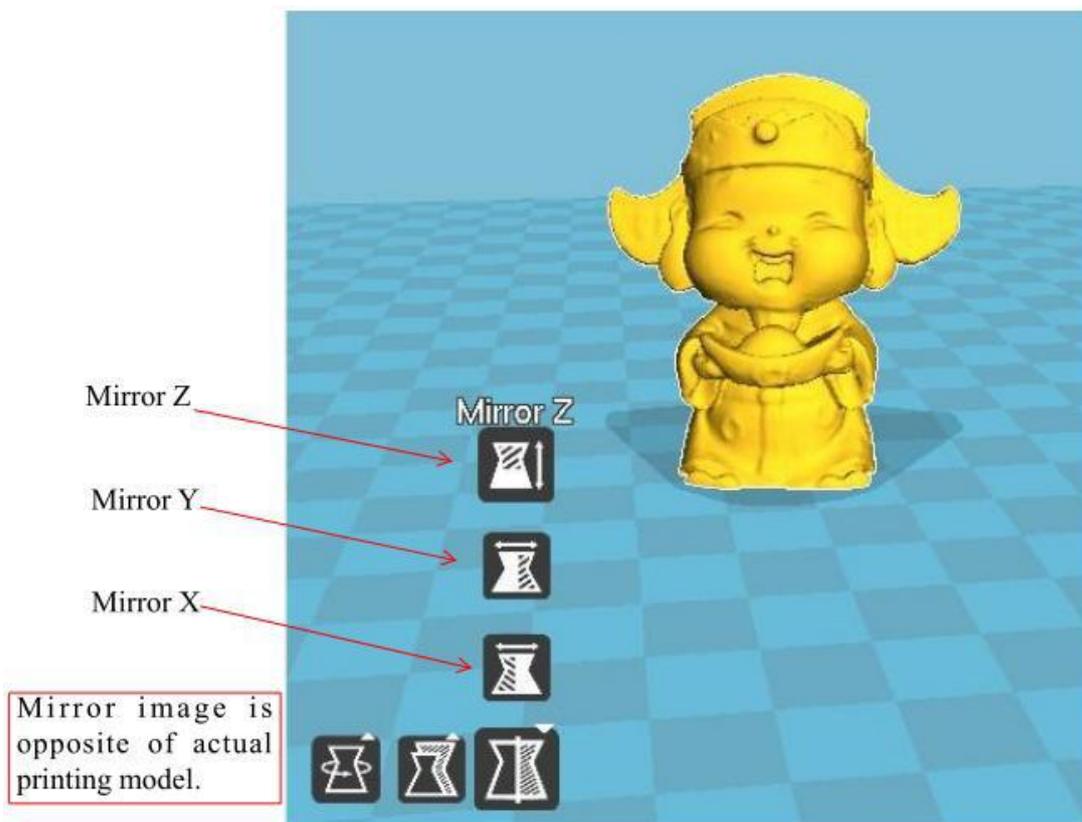
Basic setting of model in the software

Loading model

Save gcode to
SD card

Connect to "youmagine" web

Model display type

Left key: model moving

Middle key: scale view

Right key: model rotary

Shift+Right key: translation view

11 hours 59 minutes
5.99 meter 18 gram

Select model by left key, as image show.

Rotate   Scale   Mirror

Pic.38
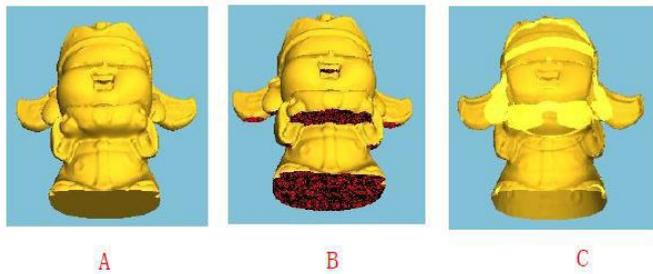
Green:
X axis
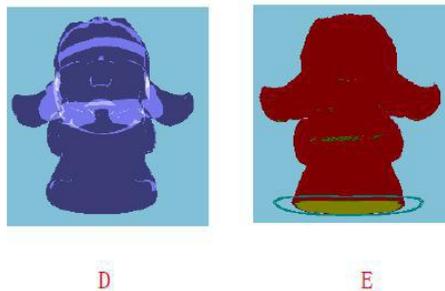
Yellow:
Y axis

Red:
Z axis

Lay flat

Reset

Pic.39

Pic.40

Pic.41
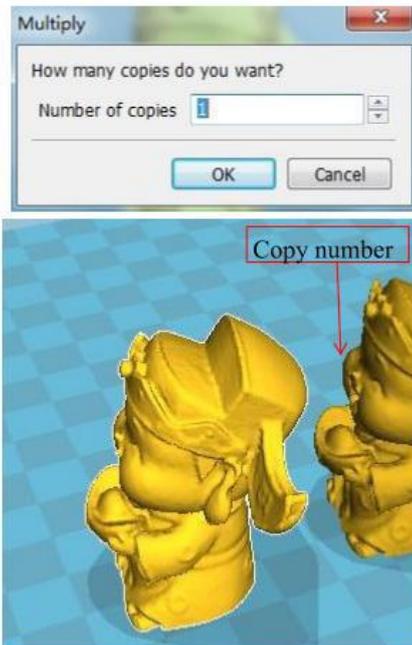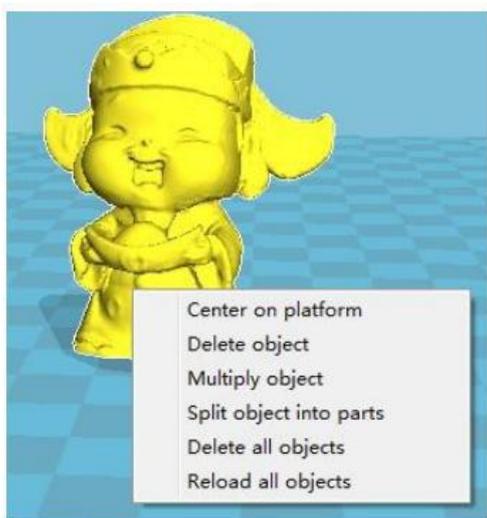
A. Normal

B. Overhand: to view overhand position (Red)

C. Transparent

D. X-Ray

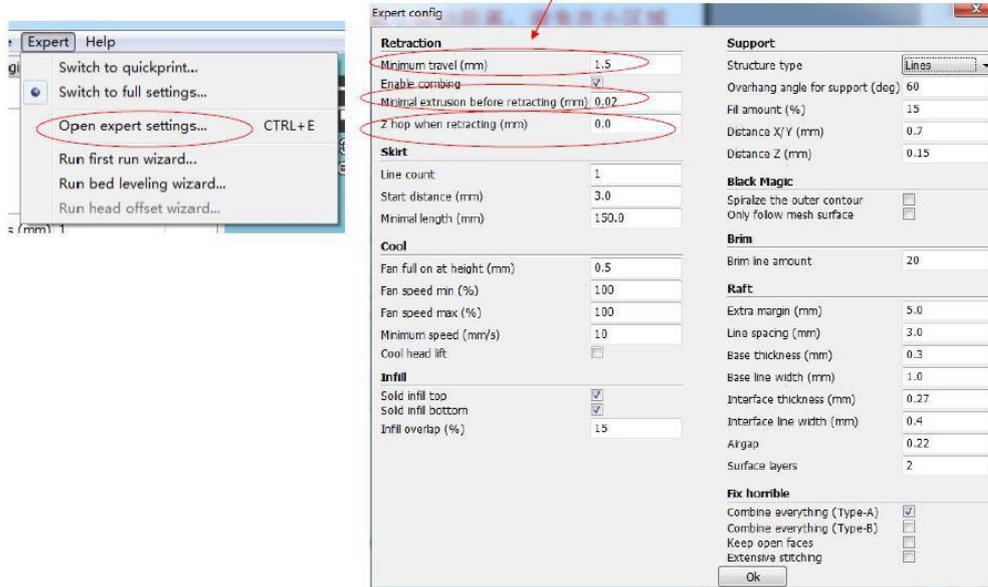E. Layers:to see the printing process
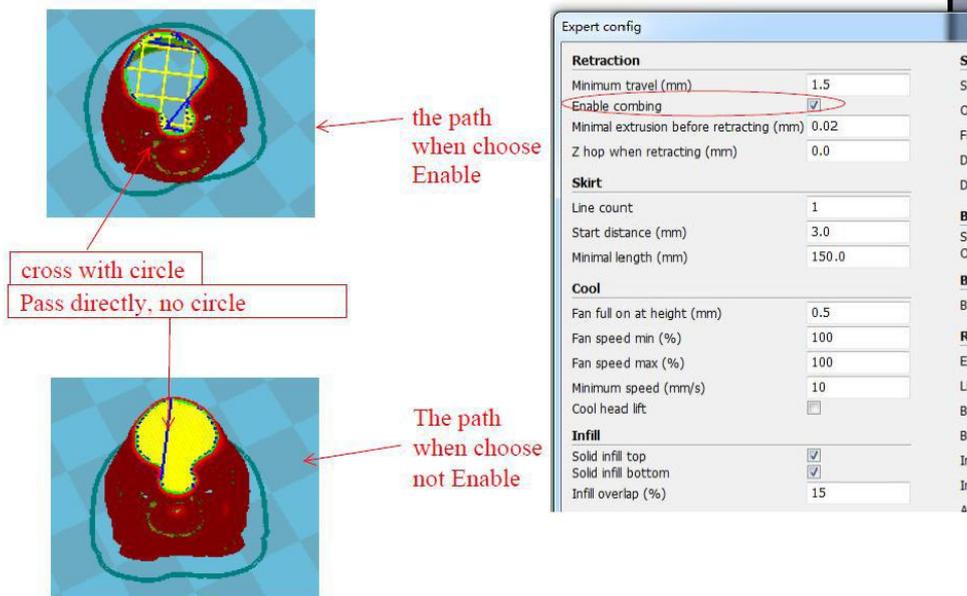
Pic.42

Pic.43

1,Software expert mode

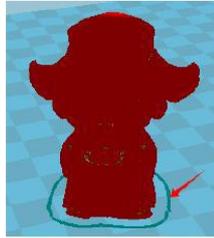Mode A   A minimum travel at small distance, must avoid frequent retraction.

Pic.44

Enable Combing is very important to the quality of surface，this is why cura is better than slic3r, choose enable combing will be better.
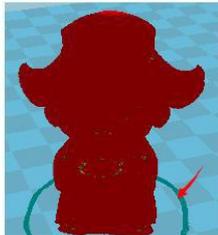
the path when choose Enable

cross with circle
Pass directly, no circle

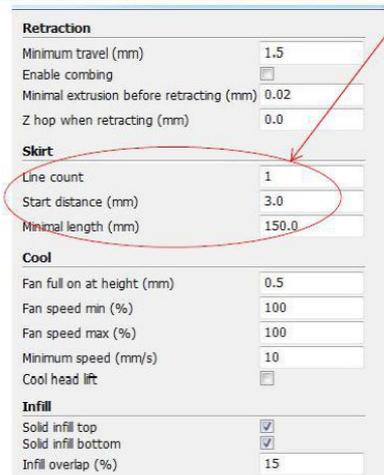The path when choose not Enable

Pic.45

Mode B

Skirt is to avoid the unfilling of extruder when the " adhesion type" is none, then we type 1, but when the model you want to print is to the limit size, while you should type 0, otherwise the skirt will make the printing size to large.

Line cout:1

Start distance:3

Line cout:3

Start distance:6

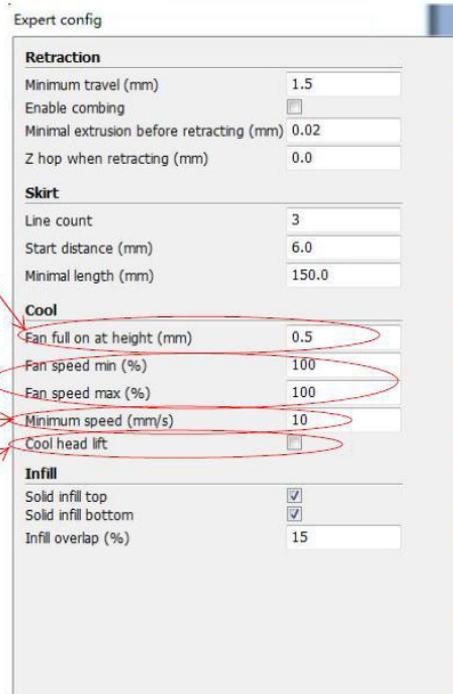| Retraction	
Minimum travel (mm)	1.5
Enable combing	☐
Minimal extrusion before retracting (mm)	0.02
Z hop when retracting (mm)	0.0
Skirt	
Line count	1
Start distance (mm)	3.0
Minimal length (mm)	150.0
Cool	
Fan full on at height (mm)	0.5
Fan speed min (%)	100
Fan speed max (%)	100
Minimum speed (mm/s)	10
Cool head lift	☐
Infill	
Solid infill top	☑
Solid infill bottom	☑
Infill overlap (%)	15

Pic.46

Mode C

In order to increase the adhesive force to platform, usually open the fan at the 0.5mm height.

If the max and min fan speed is not same, the slicing software will choose a suitable one.
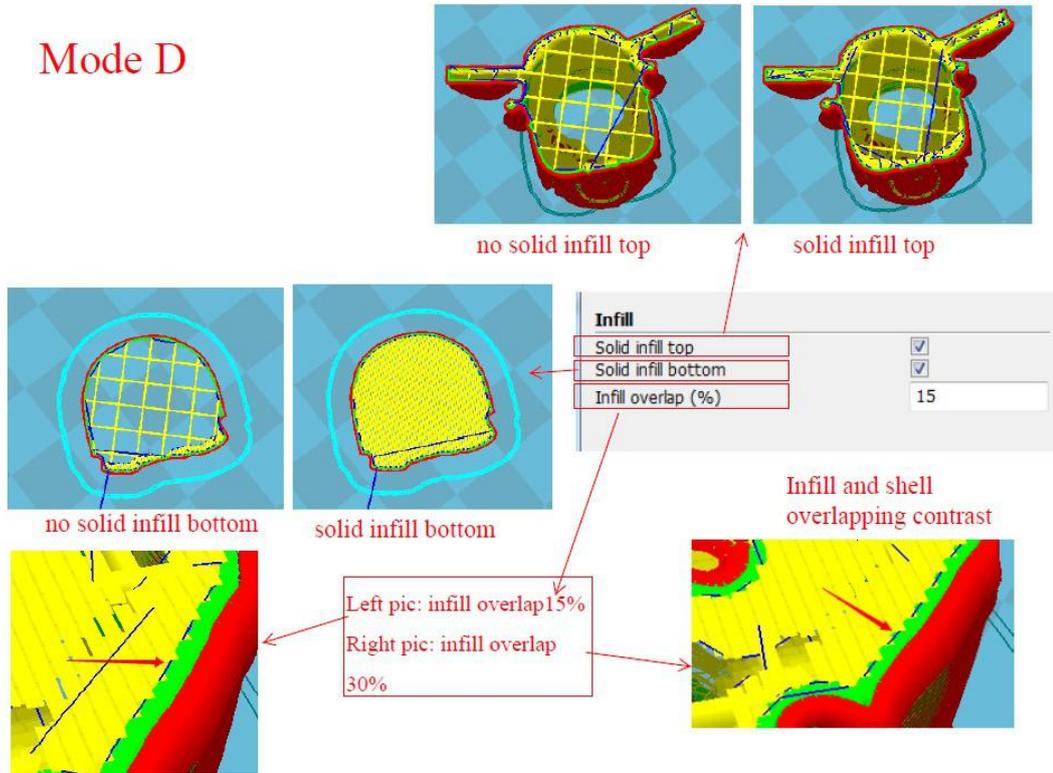
This is the limit min speed when you slow down the printing speed.

If yes, when finished printing, the extruder will delay the time to move to home, thus model will have spillage.
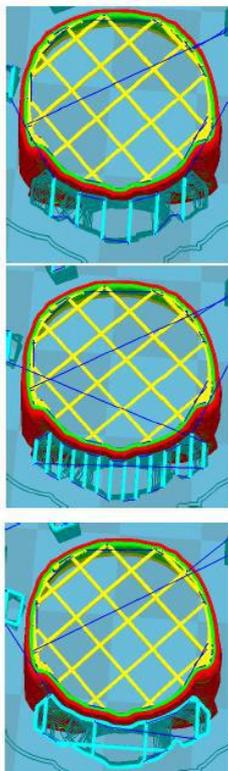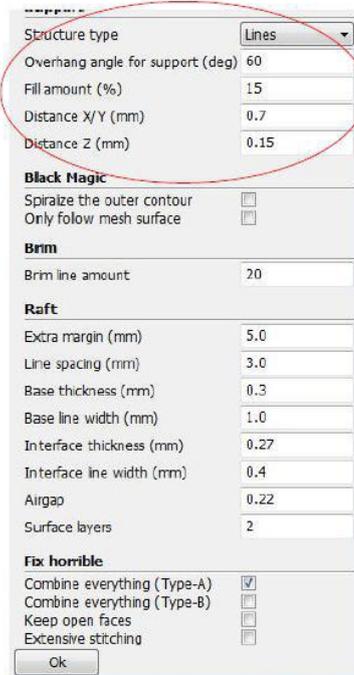
Expert config

Retraction	
Minimum travel (mm)	1.5
Enable combing	☐
Minimal extrusion before retracting (mm)	0.02
Z hop when retracting (mm)	0.0
Skirt	
Line count	3
Start distance (mm)	6.0
Minimal length (mm)	150.0
Cool	
Fan full on at height (mm)	0.5
Fan speed min (%)	100
Fan speed max (%)	100
Minimum speed (mm/s)	10
Cool head lift	☐
Infill	
Solid infill top	☑
Solid infill bottom	☑
Infill overlap (%)	15

Pic.47

Pic.48

Pic.49
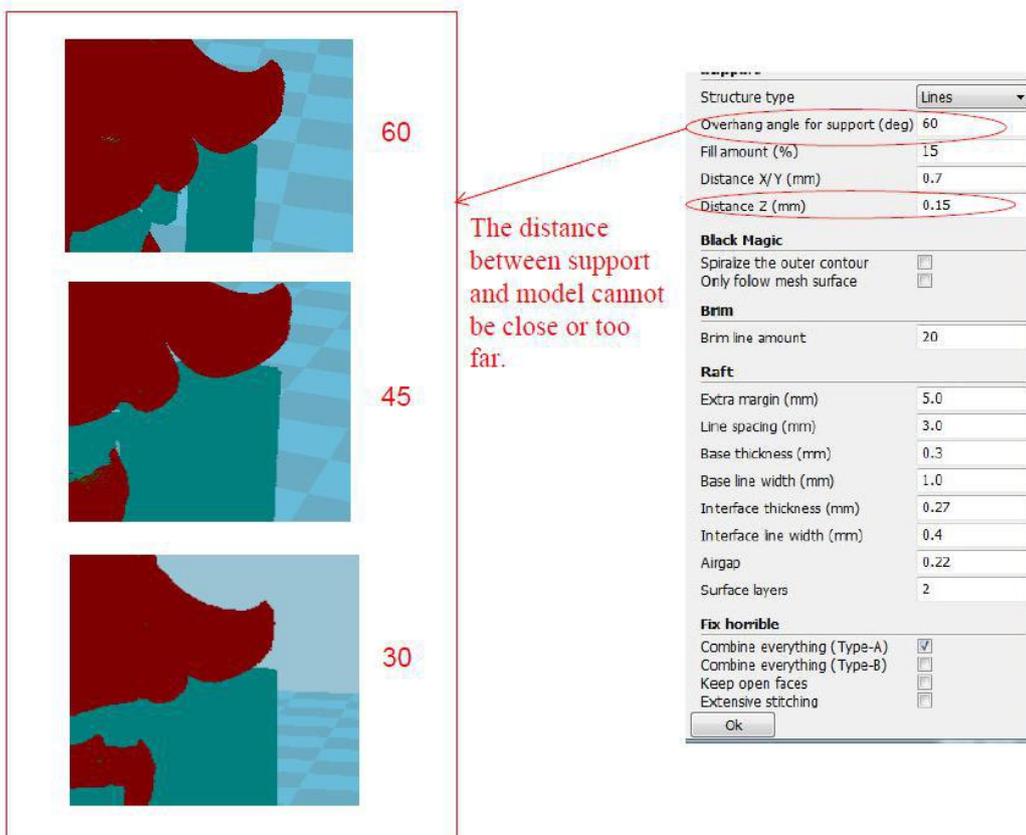
Pic.50
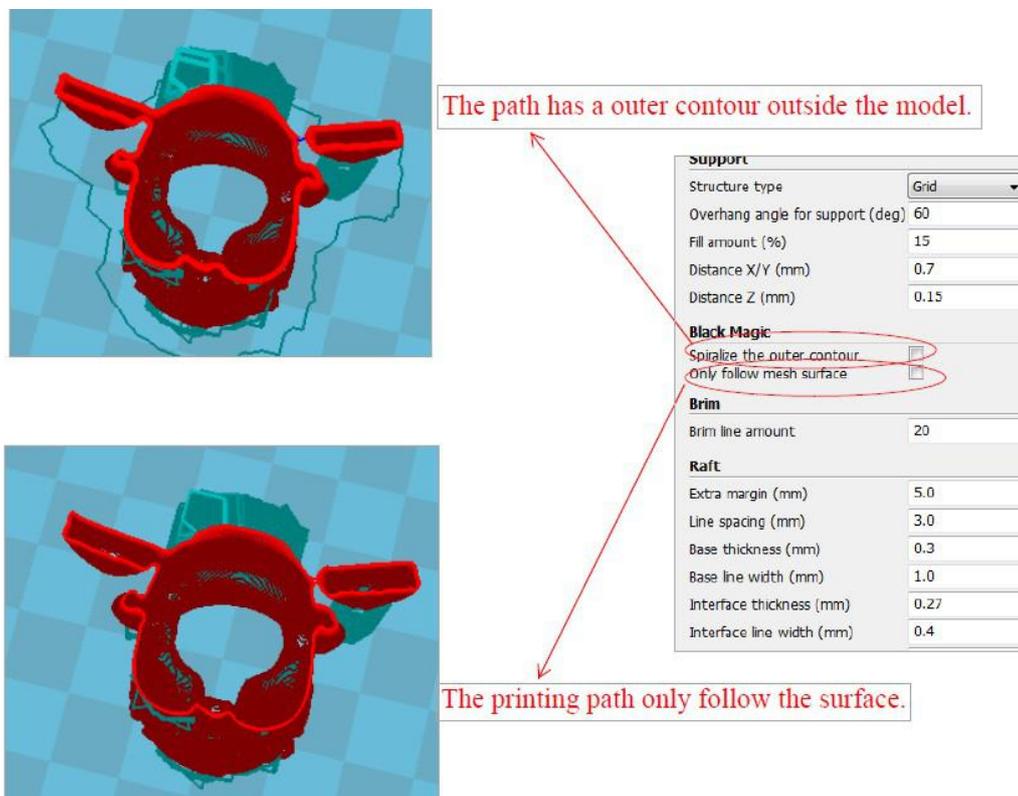
Pic.51

We set this settings as
default. Then click ok.

Raft

Extra margin (mm)	5
Line spacing (mm)	1.0
Base thickness (mm)	0.3
Base line width (mm)	0.7
Interface thickness (mm)	0.2
Interface line width (mm)	0.2
Airgap	0.22
Surface layers	2

Fix horrible

Combine everything (Type-A)	☑
Combine everything (Type-B)	☐
Keep open faces	☐
Extensive stitching	☐

Pic.52

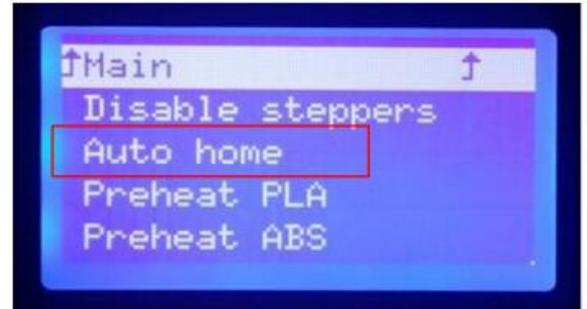# C   Printer Operating

1. LCD display interface
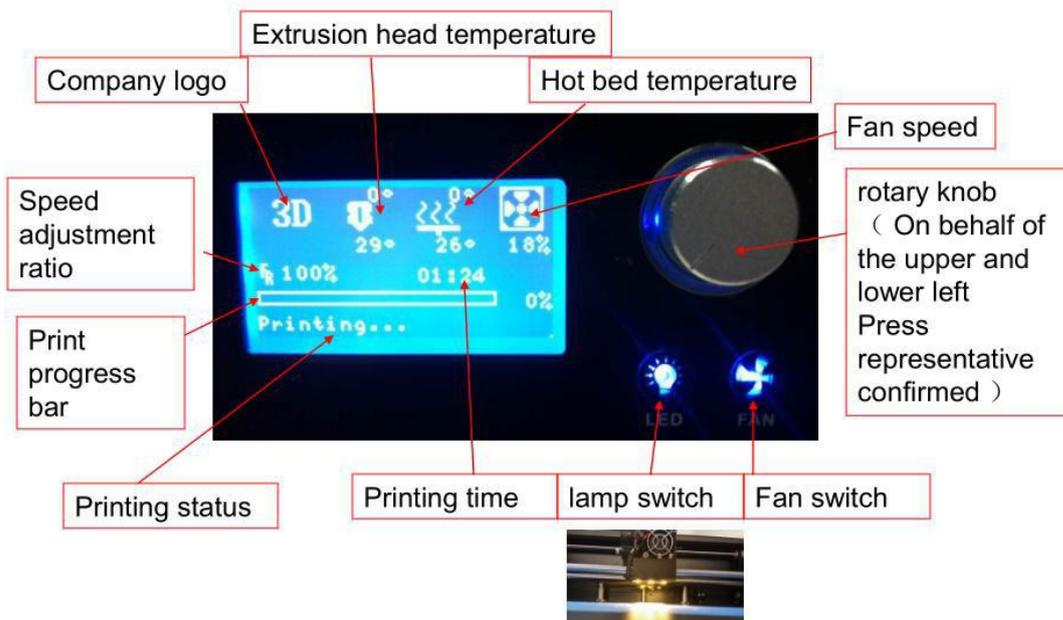
Pic.53

2、Platform leveling：

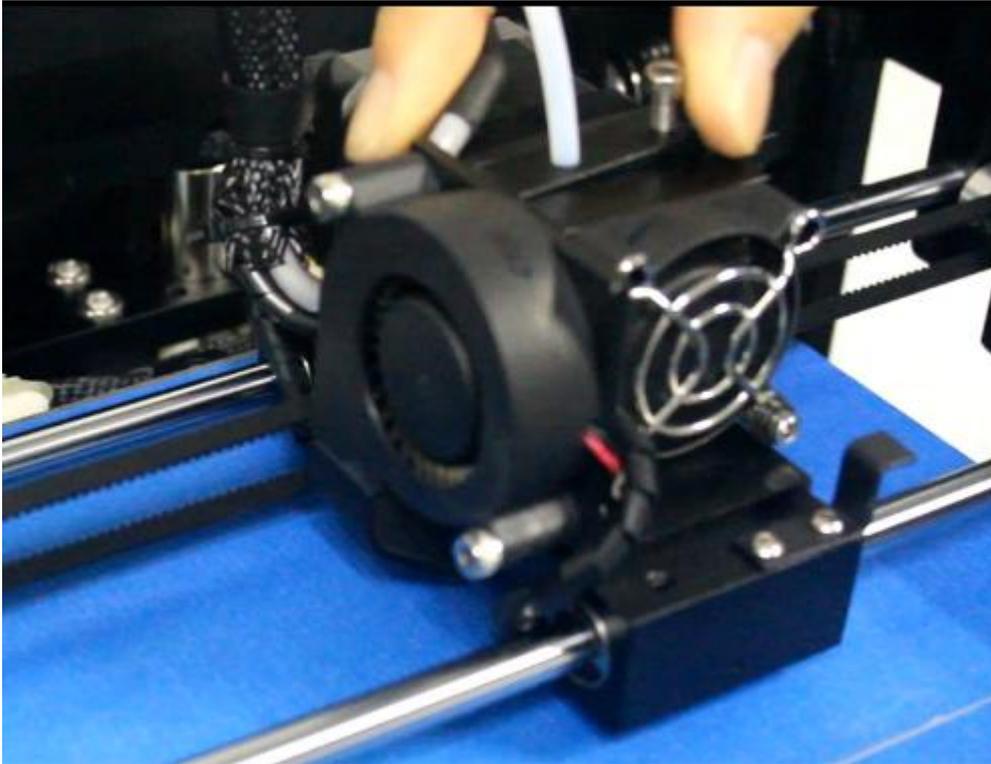A，press rotation button choice"Prepare"-"Auto"，let all axis go to home point；

B，when motor stop，twist rotation button choice"Prepare"-"Disable steppers"

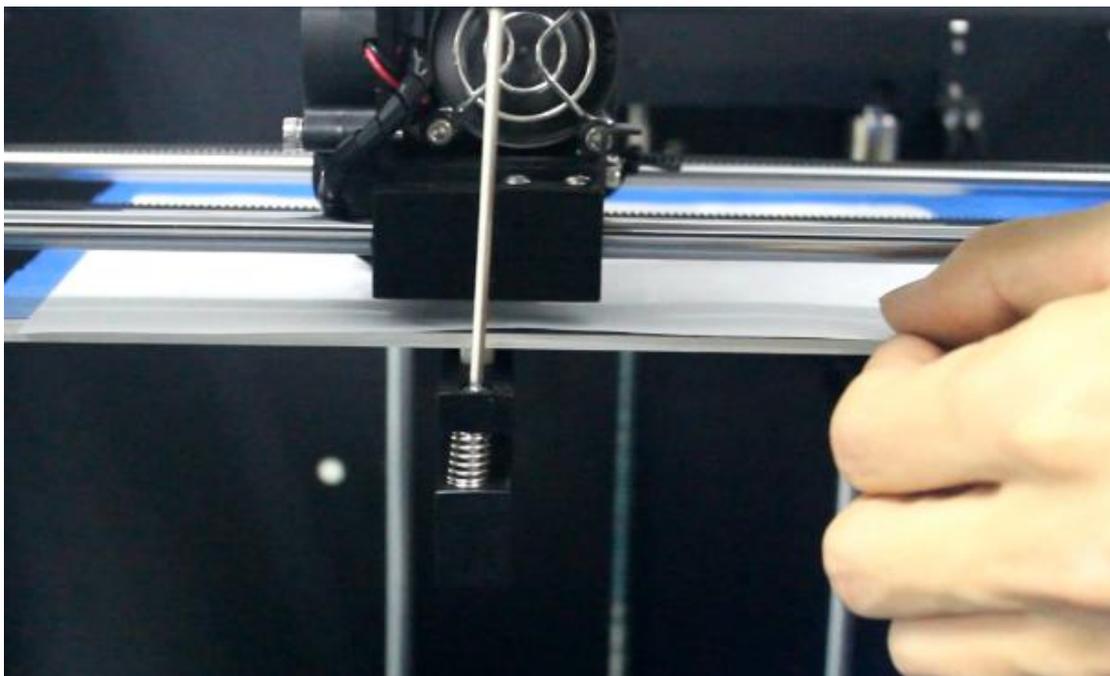C，move extruder on top of platform by hand, check the distance between platform and nozzle；

D，put one A4 paper on printing area and let it under nozzle, when move A4 paper should have little friction force.：

If too loose，mean too far，twist screw anti clockwise direction；

If too tight, mean too close, twist screw clockwise direction；

Check four corners of the distance.

E，after adjust , A4 can be withdrawn with little friction force. The distance between nozzle and platform is about 0.15mm, move extruder will not scratch platform.
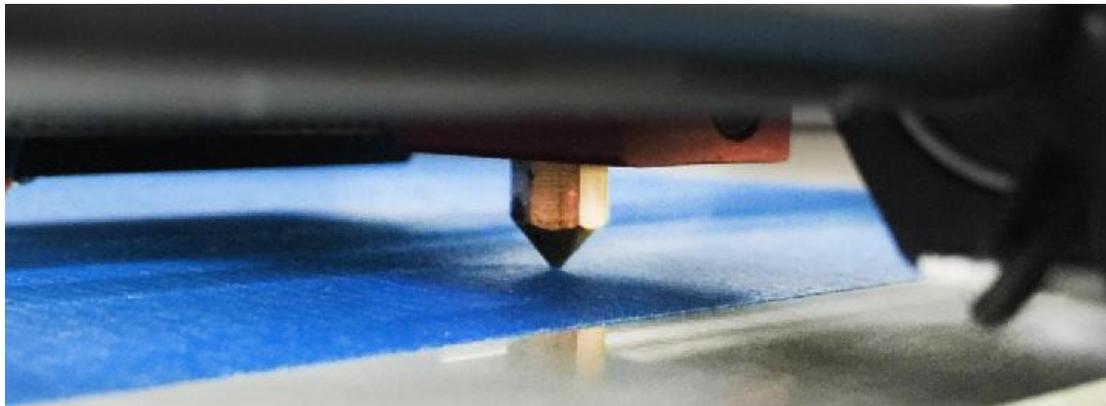
3. Filament Feeding

Press button-->Prepare-->Preheat PLA

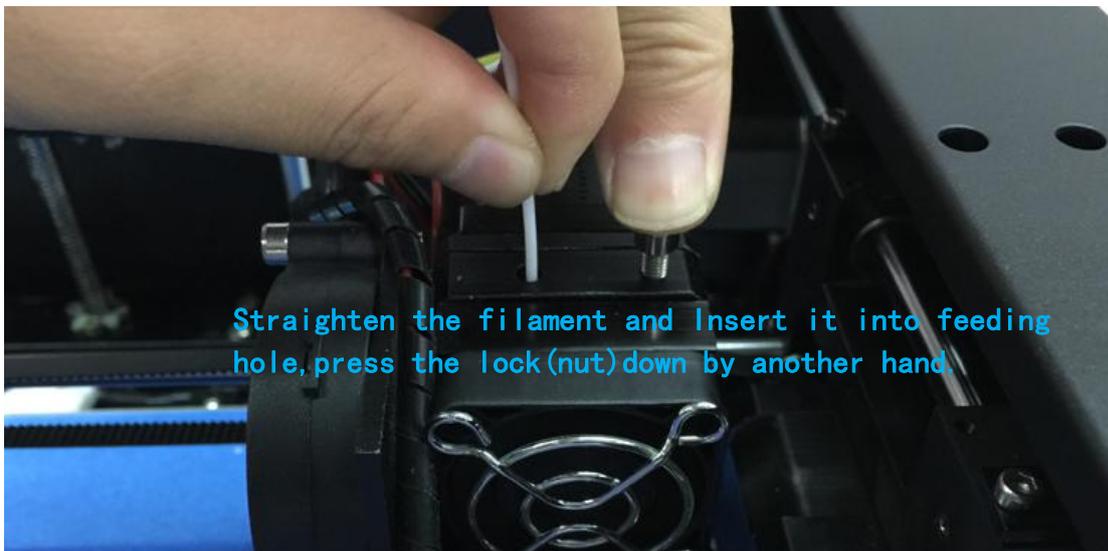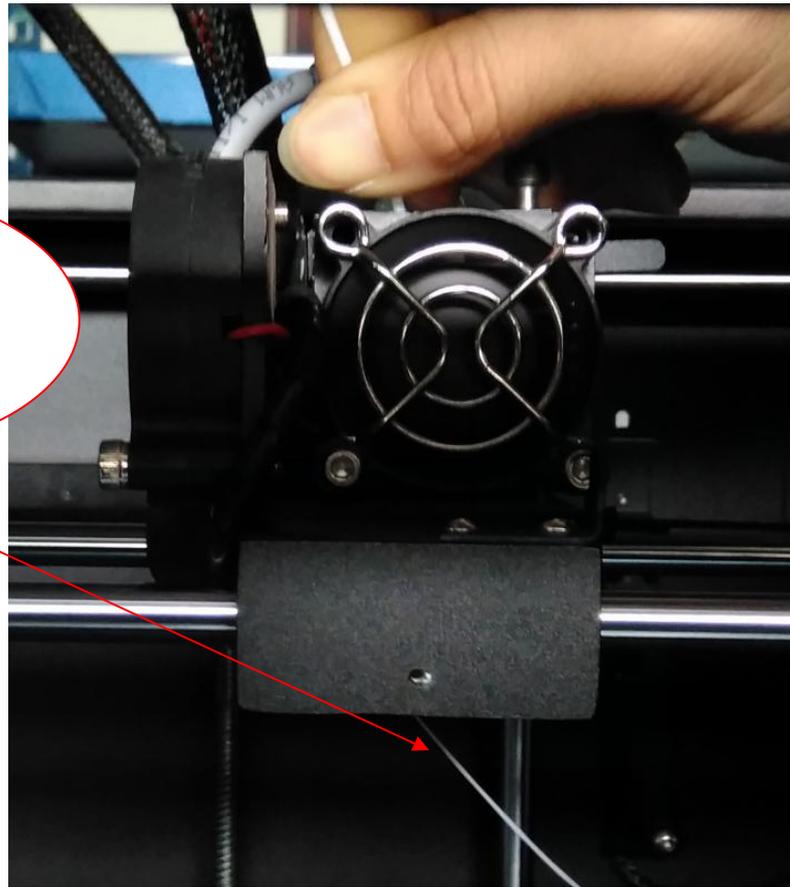After the extruder temp. reach 180 ℃. Operate as below.

Pic.54

Pic.55

Put filament to filament holder

Filament pass this tube to extruder

Pic.56

Cut a small bevel angle at the tip of filament

Pic. 57

Straighten the filament and Insert it into feeding hole,press the lock(nut)down by another hand.

Pic .58

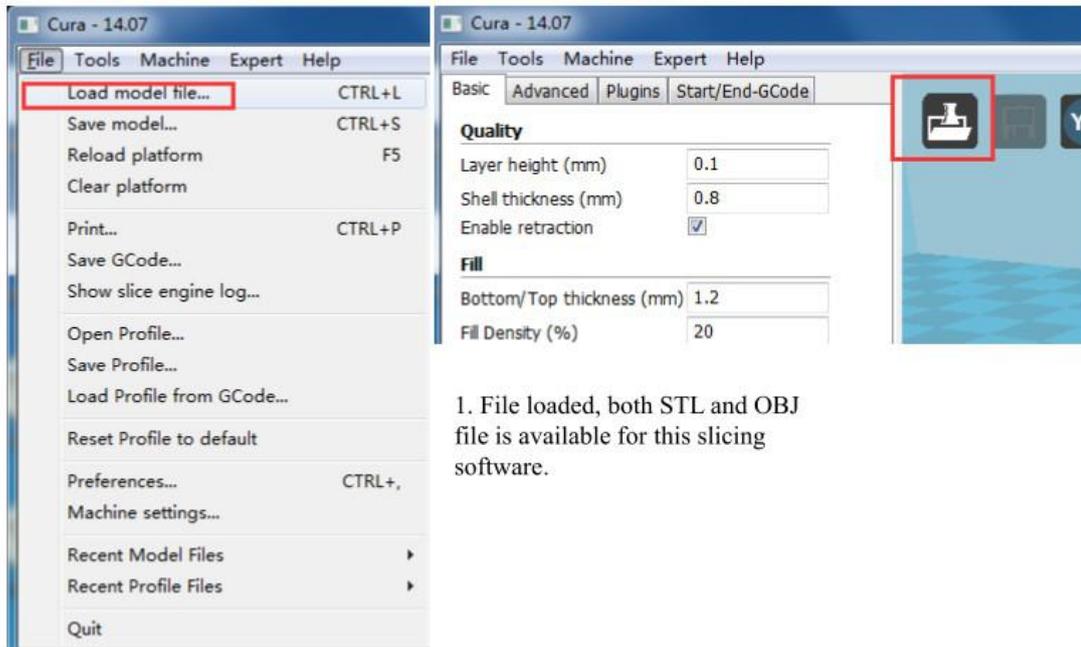After filament loaded, press filament make it come out from nozzle evenly
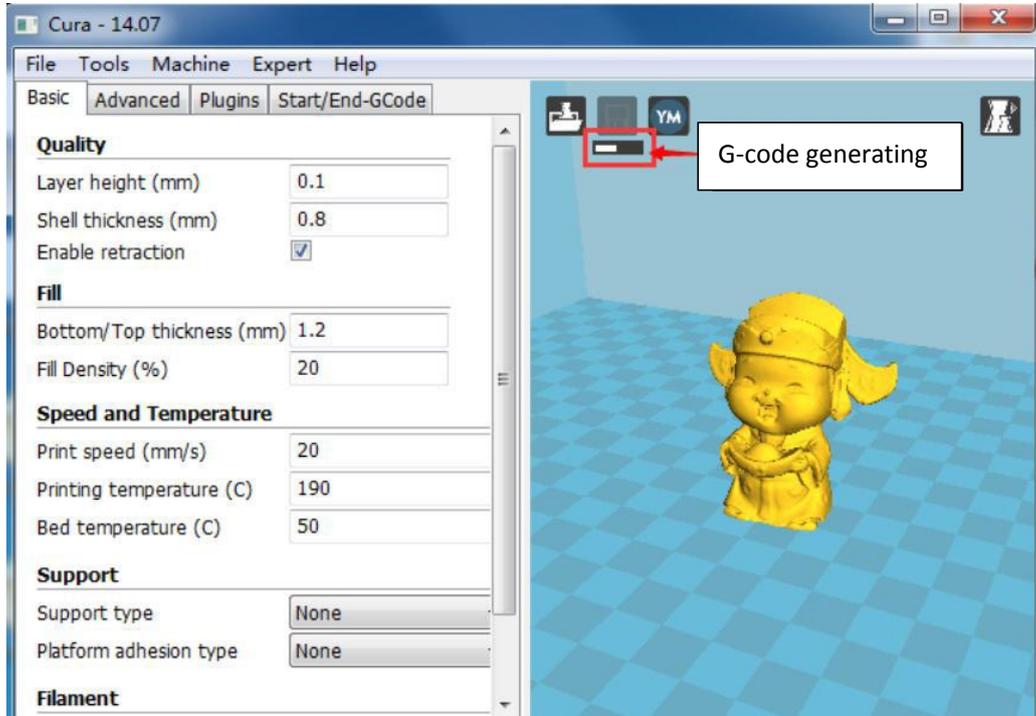
Pic.60

Filament changed notice：

1.To avoid filament replacement problem, please dont feed the all filament to the feeding mouth when one roll of filament is going to finished .New filament should be changed in time.

2.When new filament replacement, pls preheat the printer first, and then press down tight spring by hand, and feeding the filament for a moment and then pull out quickly .Remember that not to pull out hard or cold to avoid nozzle irreparable damage.
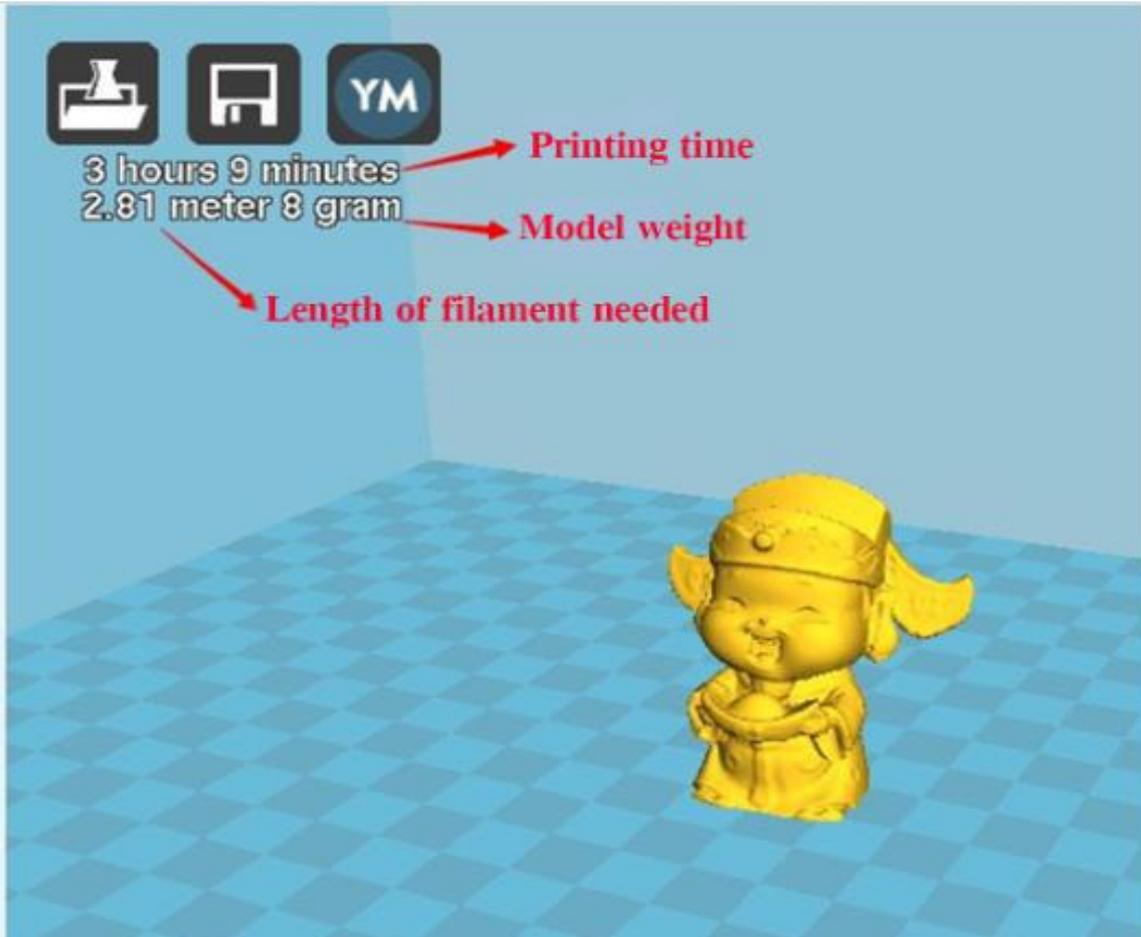
4.Printing
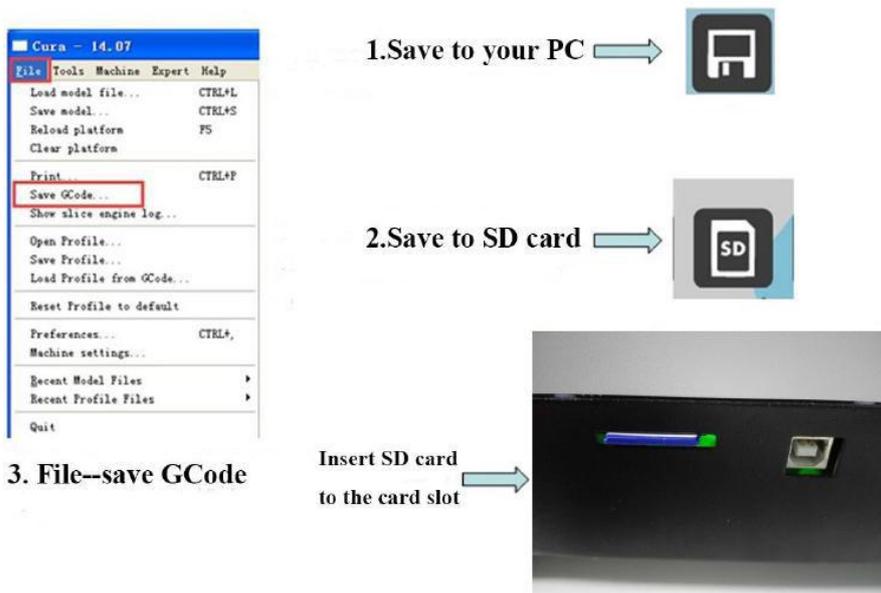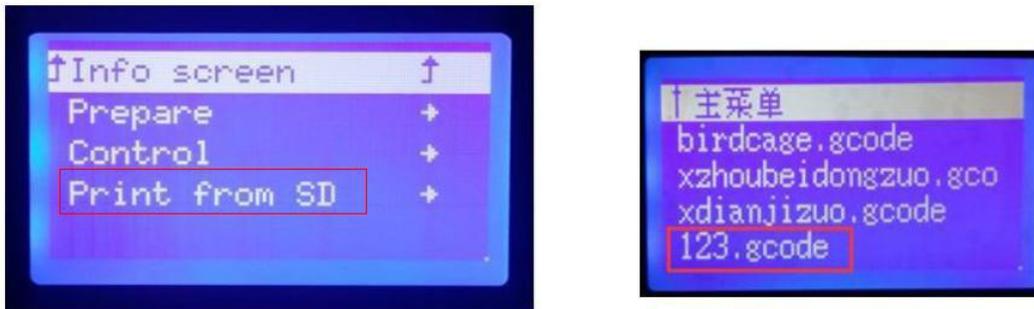
（1）Offline printing by SD card

Pic. 66

Pic.67

Pic.68

G-Code save to computer or SD card.

1.Save to your PC

2.Save to SD card

Insert SD card to the card slot

3. File--save GCode

Pic.69

Printing:

Pic.70

Select "Print from SD" from LCD display---Select the gcode you want to print (such as : 123.gcode).   then press the rotary button, the printer will automatically work up. It will heat up to the temp. which been setted in the slice software , Remark: The distance between nozzle and platform is one of the most important factor that effects printing result.

a. Far distance: Fine round , uneven, gap and tilt . In this case, printed model will be not good and uneasy to move.shown as picture:
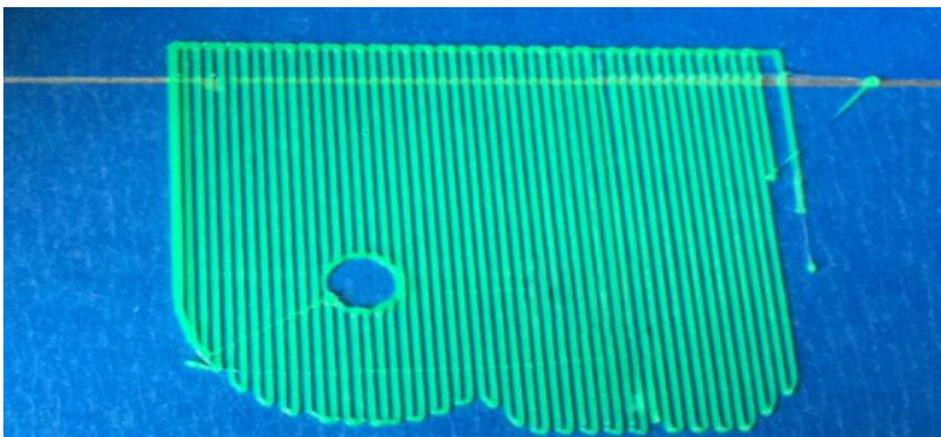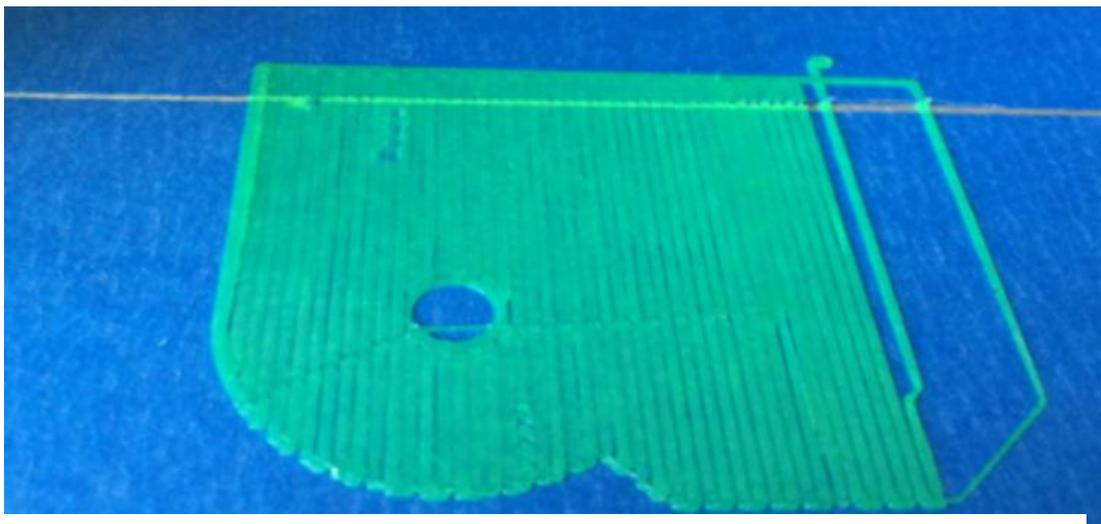

Pic. 71

b,**Close distance:** the path is too flat and the side of path is upwrap,

what's more, it will damage the nozzle, shown as pic 72.
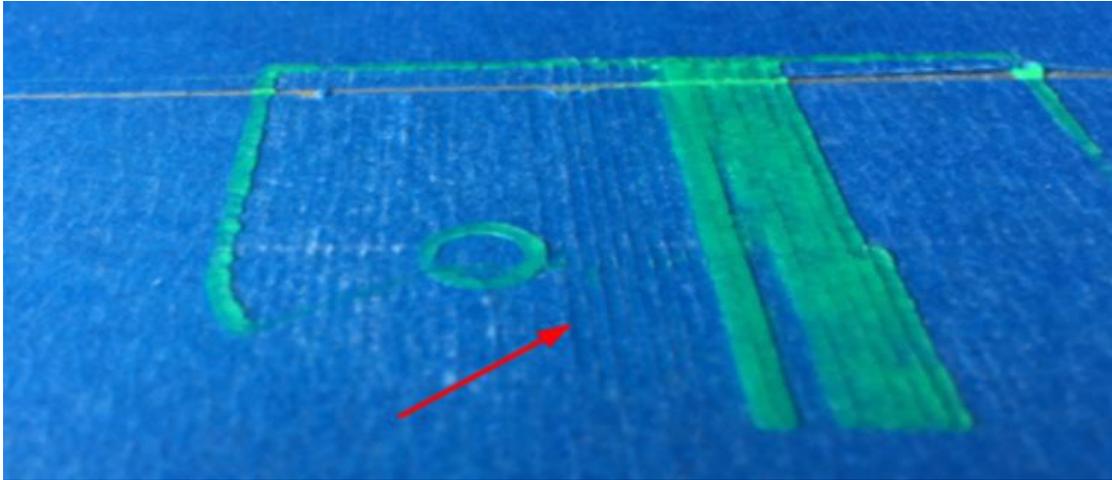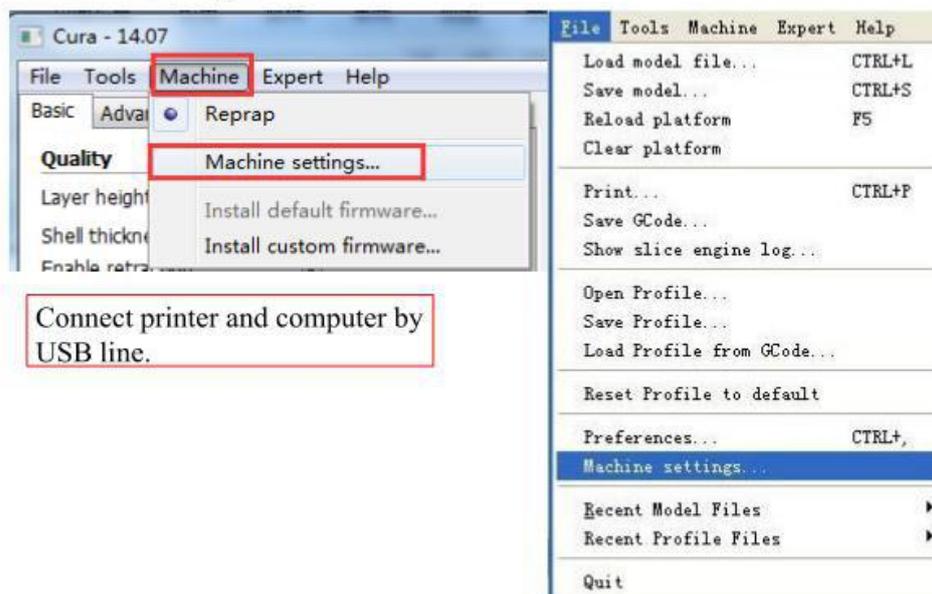

Pic. 72

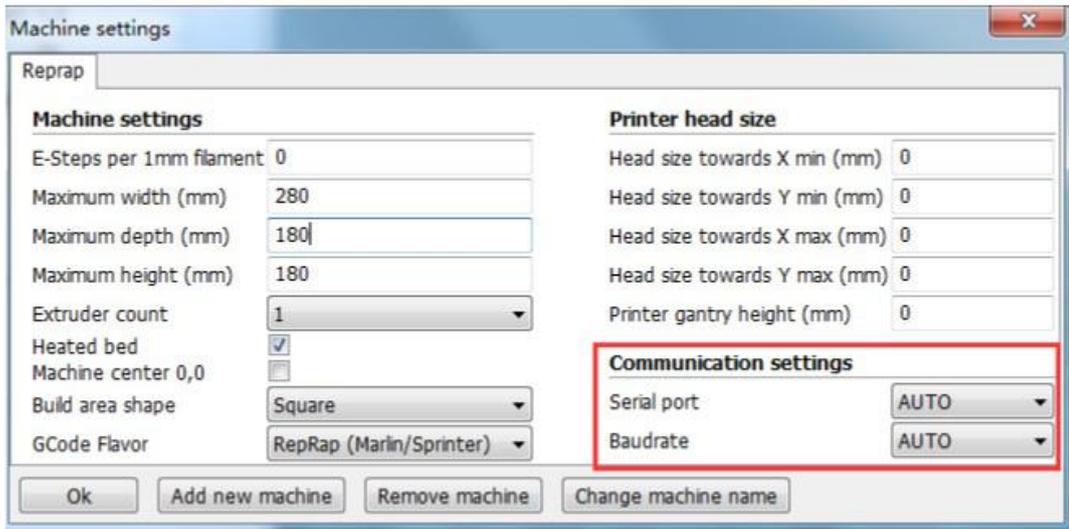**c,Right distance**：Flat skinning, gapless, shown as picture 73

Pic. 73

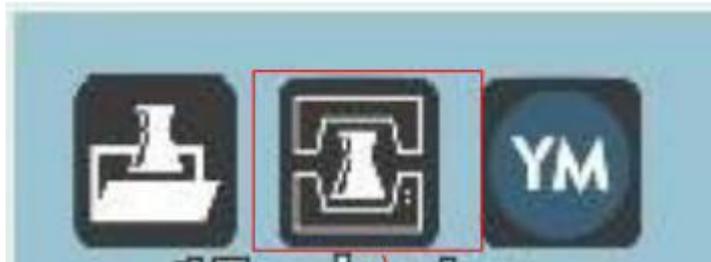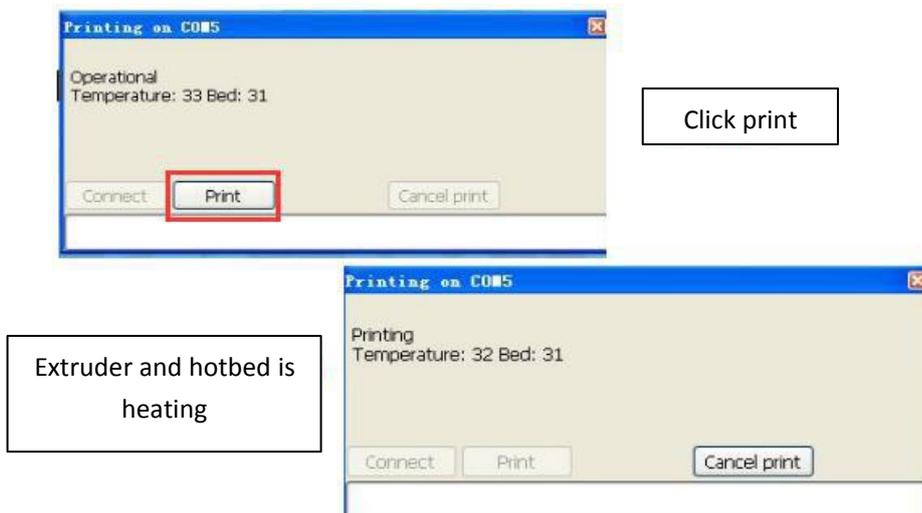（2） Online printing by USB cable

A. Machine settings:

Pic.74

Pic.75

Modifying Serial port Number（ Serial port is according to computer）
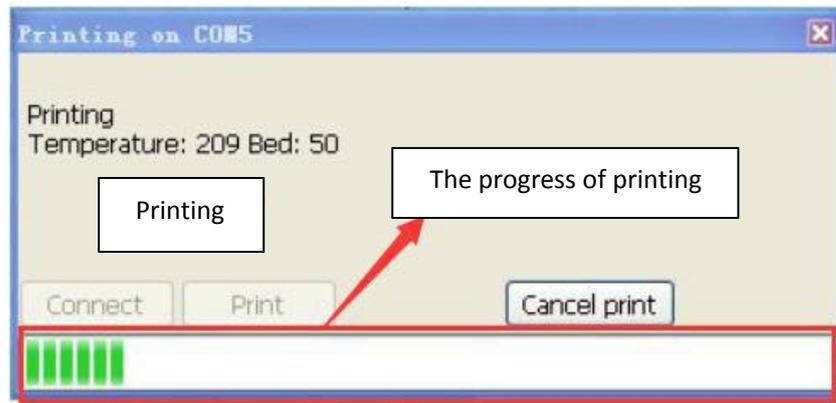
and Baudrate setting(115200).

B,Online printing

Pic. 76

Click print

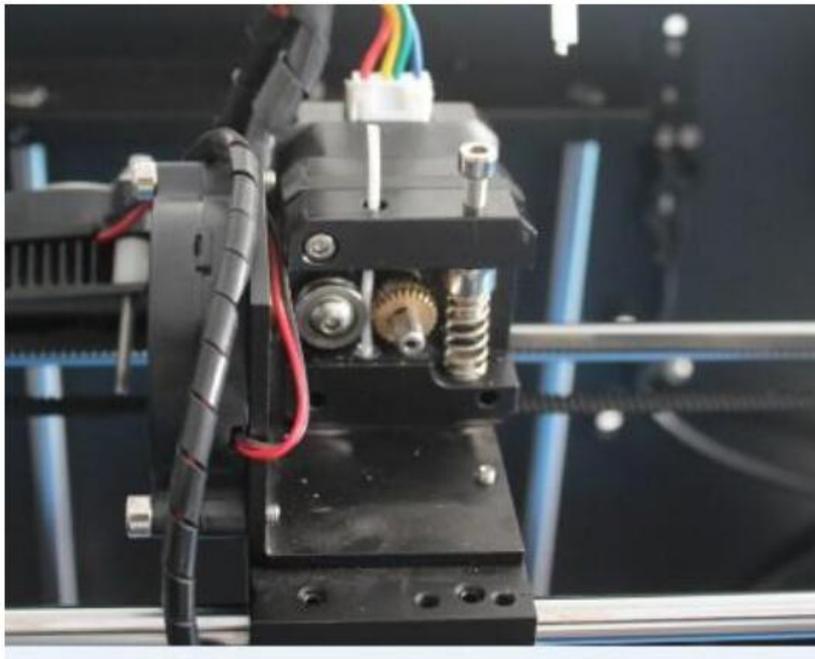Extruder and hotbed is
heating

Pic. 77

Pic. 78

E,FAQ and Solutions

Extruder Plugged

Tip: Electric fan should be took off before doing maintenance as picture shown

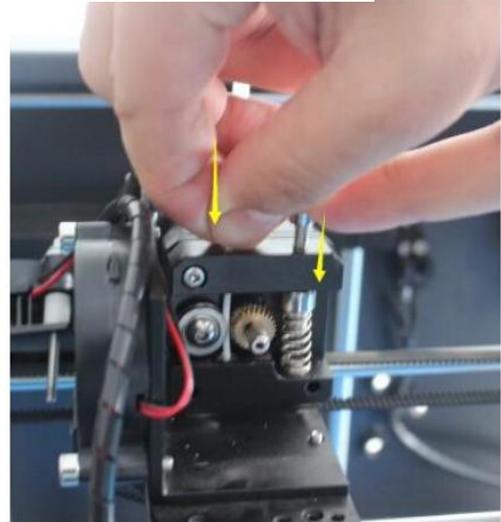Situation A: only little filament leave down and cannot pull out
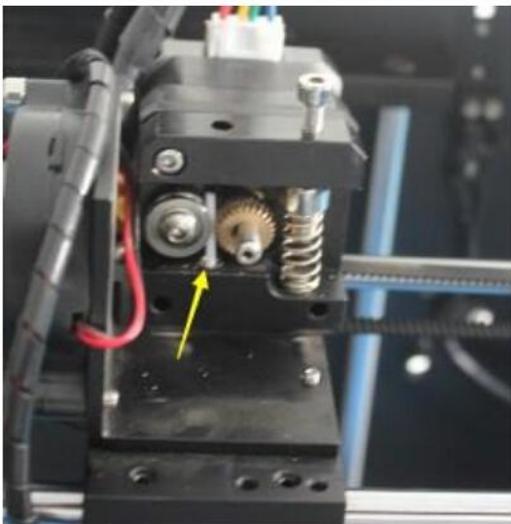

Pic.79

Select preheat PLA (it depends on ABS/PLA)
Till temp. up to set temp. （below steps are
proceed during heating）

Push filament by hand for a little bit,
then press the lock(nut) down by another hand,
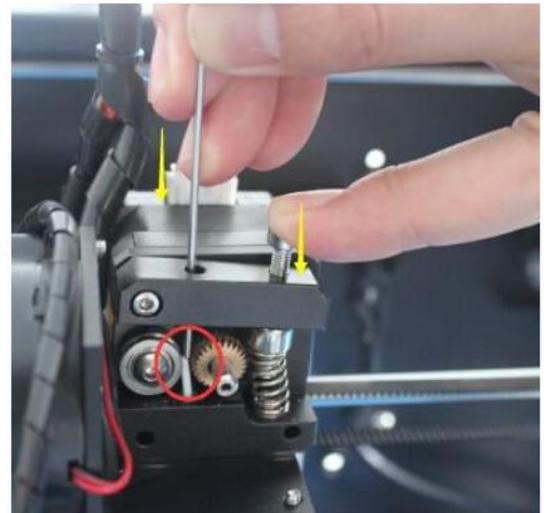and pull it out rapidly

Pic. 80

Situation B: filament do not feed into feeding mouth

Keep heating, use allen wrench to dismantle fan and heat sank
part,and use smallest hexagon wrech in tool box(as picture) to
press the remain filament till it out from nozzle competely

Pic.81

Situation C: When whole filament feed into the feeding mouth.
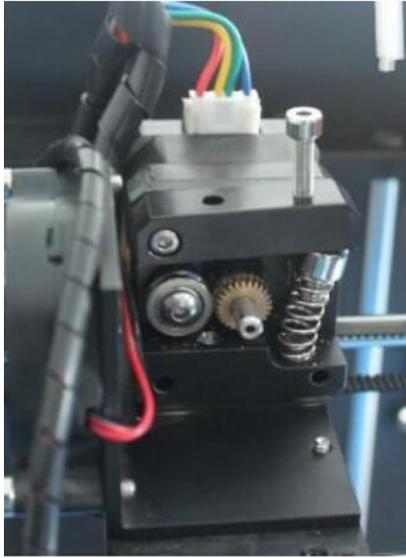
1. Loose the M4 screw
2. Take out the spring
3. Pull down Clamping piece

Pic.82

Use the smallest hexagon wrech and press the remain filament continuely till filament flow out completely. then, assemble all accessories again.

Pic.83

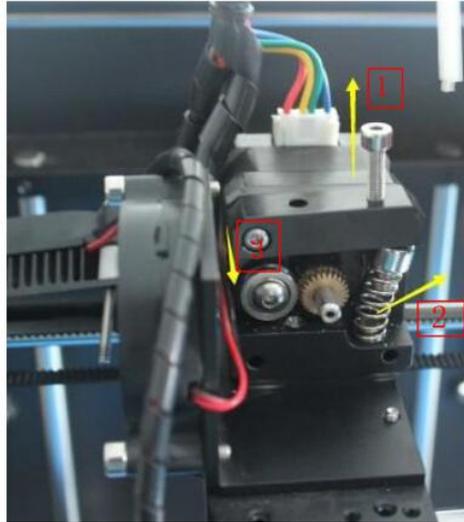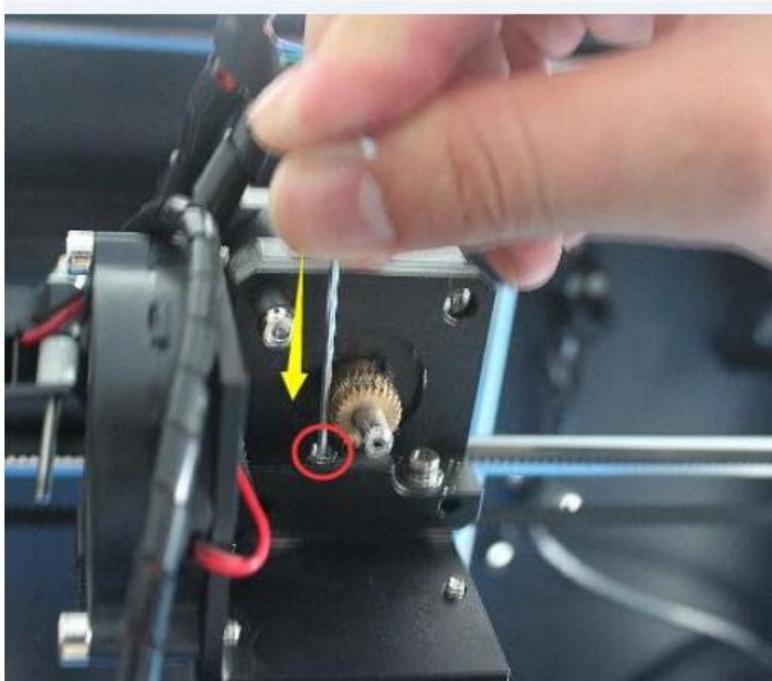|	Problems description	Reason	Solution
2	slip	Filament is too thin	Cut the thin filament
3	Temp. Is unusual	Broken temp.sensor	Change the sensor
4	Different shape as STL	Motor Pulley Screw loose	Check and Lock the screws
5	The model is warped	The hot bed is not at a level	Adjust hot bed level
6	G-code gerating failed	Wrong setting or wrong save path	Choose the right machine type and change the right path
7	Software Installation failed	Different OS	Reset OS

F,MAITENANCE

Important maintenance tips：

a. maintenance of X,Y,Z axis: Add some lubricants on the rods to reduce friction when the machine works noisy and a little bit shake

b. Please refer to the USER MANUAL before printing, do preparation of hot bed adjustment first.

c. When finished printing, the filament should keep sealing, avoid moisture.

d. Preheat the extruder at the beginning of 2nd time printing, let extruder auto-push filament for a while.

e. Machine should do some regular maintenance, drop some lubricating oil on thread rod, polished rod and bearings to avoid fatigue wear.

f. Do not let the fan and air-condition blow to the hot bed when printing.

g. Keep the working condition at "Temp:10-30℃, Humidity:20-70%".

G,AFTER SALES SERVICE

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