

PLA filament print correctly instructionsA.

1. Characteristics of the PLA material

PLA derived from biological materials ,poor thermal conductivity, bad temperature resistant in amorphous form, very good rigidity. PLA is amorphous material at room temperature, , there will be tendency to crystallize in the process of heating, strong crystalline endothermic peak of DSC curves can be observed at 58 degrees and 109 degrees, indicating that when the ambient temperature is greater than 58 degrees, PLA molecular tends to rule arrangement, that is crystallization, crystal PLA molecular structure of each other spacing is close to the Nano, it can be said that the PLA crystal is nano material, nano materials PLA has more good strength and heat resistance.

The amorphous PLA melting point is 120-150 degrees, softening point is 50 degrees, crystal PLA melting point and softening point are 180-210 degrees, thermal conductivity is further decreased.

According to my experience in plastic extrusion processing, a 200KW sheet extrusion machine, processing temperature is 200 degree, stop to adjust, start the extruder again after three minutes and found great came from the barrel of the machine screw grinding sound, followed by the current surge , extruder inverter drives for the protection then power turn off. This happens because the PLA has a considerable proportion of crystalline particles in the heat of barrel, wrap the screw, due to poor thermal conductivity, most of the pellets can not be completely heated melting, giant strong friction screw with extremely rigid pellets issued loud noise.

PLA for the 3D printer, harmless gas because of its environmental health, heating issued without prejudice to the human body, the taste is not stimulated, but the printing process is relatively smooth, the heating temperature does not require too high, and very popular with enthusiasts like 3D printing . But if used PLA also paid great attention to the sliver tendency to crystallize and stuck the machine.

2. Solution for PLA material block the nozzle

Ordinary industrial make PLA modified to make it fast crystallization performance, but even a little bit of crystallization tends to cause adverse effects for 3D printer extruder. PLA block nozzle found in:

- (1) filament were inserted into the thin end touched the nozzle of the extruder, generated Gcode take a long time, and the heater are in operation among the Gcode completed when you start printing, we found that the PLA filament can not be squeezed out;
- (2) After printed a PLA model,not immediately pulled out filament from the extruder, the filament in the extruder residence time more than 30 seconds, the printer again start, found that the PLA filament can not be squeezed out;

When the nozzle is blocked, it takes great effort to pull out the PLA filament from the extruder, and found that PLA filament end shown below the right one as follows:



Pic 1 PLA filament were pull out from extruder

Try hard to pull out the filament ,find PLA that contact with the feed motor is a "bite", indicating that the normal operation of the feed motor, pressed the PLA, but PLA did not go down below since the resistance is huge. From the feed motor to go down, and after a second "bite" at the filament in contact with heat sources, presents the second "bite" of depression. The contact of the bottom of heat source in a relatively short period of time and filament were not to continue go down, then heated the PLA, from amorphous form first soft (amorphous form of PLA softening point is 50 degrees , where contact with the heat source temperature is generally 100 degrees or so) and then accumulated thermal history tends to crystalline, PLA began to harden, the PLA filament feel here is much harder than the other at the amorphous PLA, crystallization of the PLA density smaller, volume expansion, stuck in the extruder . That is not to go down, and it is difficult to pull out.

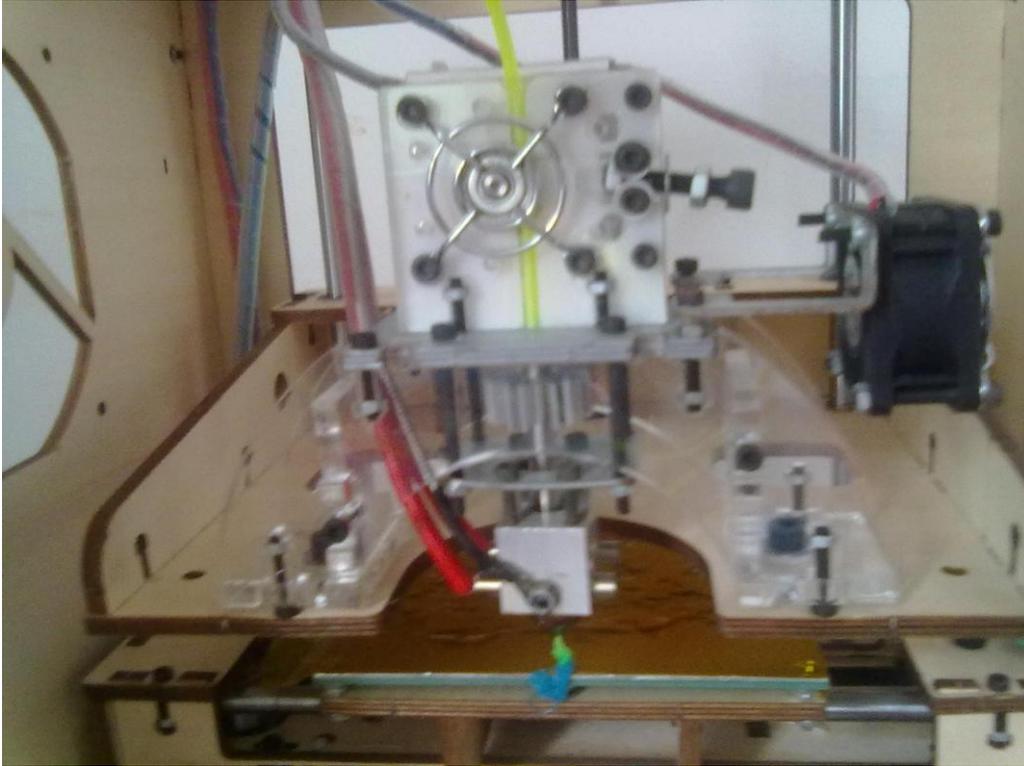


Pic 2 PLA filament were pull out from extruder

If after you finish the print model, the PLA filament were pulled out immediately from the extruder ,observe that end of contacted with the nozzle is the melting like cone-shaped.

Hence, we propose to correct the printing process is:

- (1) set PLA processing temperature is 185-210 degrees, according to the extrusion of the actual situation ,when generated Gcode, PLA filament do not need to insert the extruder, confirm that extrusion start printing insert PLA, in order to ensure at the beginning can touch nozzle, you should:



Pic 3 of PLA filament inserted manually

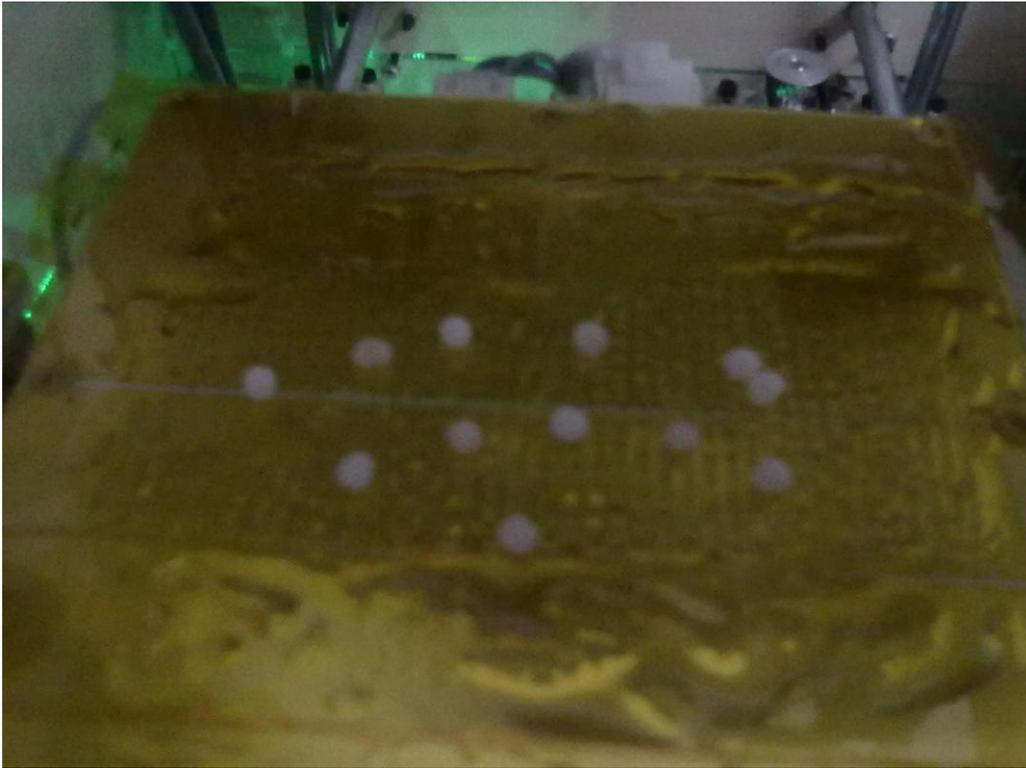
Manually insert the PLA filament, extrude the previous filament which can be residual in the extruder, then the present PLA filament have been inserted in place, set screw and tighten. Printing officially began.

(2) model is printed, immediately set screw to loosen, pull out the PLA filament, repeat step (1) to print the next model.

Follow (1), (2) steps to print PLA, many test printing are not blocking machine.

3. Solution for PLA not stick to hot-bed

Due to the crystallization of PLA showing glassy characteristics, surface energy is very low, the surface loses stickiness. Contact part of the PLA printing model lose stick to hot bed h, a long time by heating the this bottom layer tends to the complete crystallization showing the glassy solid state, loss of adhesion to hot-bed general, we recommend purchased hot melt glue rod , smear evenly on the surface of hot bed, due to the hot melt adhesive will remain sticky in the heat situation, would not crystallization like PLA model ,better cement. We also suggest our hot melt pellets, as follows show:



Pic4 hot melt pellets on the hot bed

Removal model, sprinkle a few hot melt pellets of KS860 on hot bed, then press with knife



Pic 5 KS860 evenly coated in the hot bed

Can achieve a large PLA model printed on hot bed,



Pic 6 using the KS860 hot melt pellets on hot-bed



