3D Industries – Hot End changing procedure

1 Preamble

The 3D Industries printers use the same model of ALUHotend. This has been developed by 3D Industries and is also sold separately for use in other machines.
A 3D Printer from 3D industries is supplied with a spare hot end. The use of quality filament is essential and the printers all features a filament cleaner which means that blockage of the hot ends is rare. If the hot end has issues or if the hot end is to be swapped or any reason then the following instructions should be followed. If this should have issues then this should be returned to 3D Industries for checking.

2 The 3D Industries Hot End

The function of the Hotend is to maintain a reservoir of molten plastic and cause some of this to be extruded through the nozzle when new unmelted plastic is pushed into the melt point. The hot end consists of:

- The Aluminium heat sink
- The stainless steel thermal barrier
- The aluminium heater block
- The heater cartridge located in the heater block
- The thermistor located in the heater block
- The brass nozzle located in the heater block

The filament path through the aluminium heat sink, through the throat into the hot end to the nozzle is lined with PTFE tubing.

When a 3D Industries printer is purchased a free hot end is supplied. Should the hot end in the printer need to be replaced, the spare can be installed and 3D Industries advised who will despatch another to replace the spare. The returned must be returned to 3D Industries and not disassembled.

Picture

3 Removing the hot end

Heat up the nozzle and remove the filament:

- From the status screen push the knob and select **"Control** " and push to confirm, a new menu is displayed.
- Rotate the knob to select "**Temperature**" and push to confirm
- Select "**Nozzle**" and push to confirm.
- Rotate the knob to indicate the required temperature according to the filament that was being used (PLA 220 ABS 240).
- Meanwhile partially unscrew the pressure plate adjustment nuts to release pressure on the filament and lower the build table if necessary to allow space to drop out the hot end.
- When the nozzle temperature is reached pull out the filament from the hot end.
- Turn the printer off to let the hotend cool and stop the fans.

Remove the hot end:

- Cut the cable clips and unplug the four pin plug of the hot end at the top of the extruder.
- Loosen the two screws holding the fan to the extruder (about 1 cm of thread should be visible) and pull back the clamps

(picture)

- Drop the hot end out of the extruder and place to one side.

4 Inserting the hot end

Position the hot end in the clamp and tighten the two screws ensuring that the heater block is aligned squarely.
Plug the hot end four pin plug into the socket at the top of the extruder.
Secure the hot end wires with cable ties.

Heat up the hot end.

- From the status screen push the knob and select "**Control**" and push to confirm, a new menu is displayed.
- Rotate the knob to select "**Temperature**" and push to confirm.
- Select Nozzle and push to confirm.
- Rotate the knob to indicate the required temperature according to the filament that was being used (PLA 220 ABS 240).

The selection made will set the target nozzle temperatures.

- When the nozzle is heated feed in new filament by winding back the previous filament onto its spool, insert a new spool of filament and feeding the end of the filament up through the filament cleaner through the PTFE until it appears at the other end of the PTFE tubing at the extruder.
- Neatly cut the filament at about 50 degrees and straighten a 3 cm length.
- Feed the straight filament down into the extruder holding it vertical and straight until it passes through the hot end throat into the heater block and nozzle. Pushing the filament downwards should result in plastic being extruded from the nozzle. This indicates it is properly fed and that the nozzle is hot enough to melt the filament
- Tighten the adjustable extruder pressure plate using the nuts until the filament is grasped tightly by the pressure bearing and the knurled wheel. Using two fingers of both hands carefully push and pull the filament into and out of the extruder a few millimeters. The knurled wheel on the end of the motor shaft should be observed turning as the filament is moved. If necessary tighten a little more and try again.
- Ensure that the nozzle temperature is set correctly for the new filament type.

5 Test filament insertion.

- Move the carriage to the left or right front corner.
- On the LCD control from the status screen depress the knob and select "**Utilities Menu**". Press the knob to confirm.
- Select "**Move Axis**" and press to confirm.
- Select "**0.1 mm**" movement and press to confirm.
- The **Move axis** menu is displayed, select "**Extruder**" and press to confirm.
- Rotate the knob to the right, after a while plastic should be observed being extruded. If it is not hold the filament as it enters the extruder and test that it is being drawn in firmly. If not tighten the pressure plate nuts some more (half a turn at a time) and repeat the test. (*See note*)

When the filament extrusion has been tested:

- Restart the printer.

Preheat the printer:

- Select "**Utilities Menu**" and push to confirm.
- Select "**PLA"** and push to confirm. (or ABS if ABS type plastic is being used)
- Select "**PLA 1"** and push to confirm. (or ABS-1 if ABS type plastic is being used)

The nozzle and bed temperatures should be indicated on the status screen and the actual temperature will rise towards the value.

When the bed and nozzle temperature target temperatures and have been reached:

- Press the control knob and select "**Print SD**" and push to confirm.
- Rotate the knob to select "**CALIBRATION**" and push to confirm.
- Select "**Cube**" and push to confirm.

The printer will now start to print the cube calibration object.

There is no need to complete the printing of the entire cube if it appears that it is printing correctly. Press the knob and select "**STOP print**" and push to confirm.

The printer will stop printing. Move the carriage to the side or corner of the print area and remove the test print.

The printer is now ready to print.
