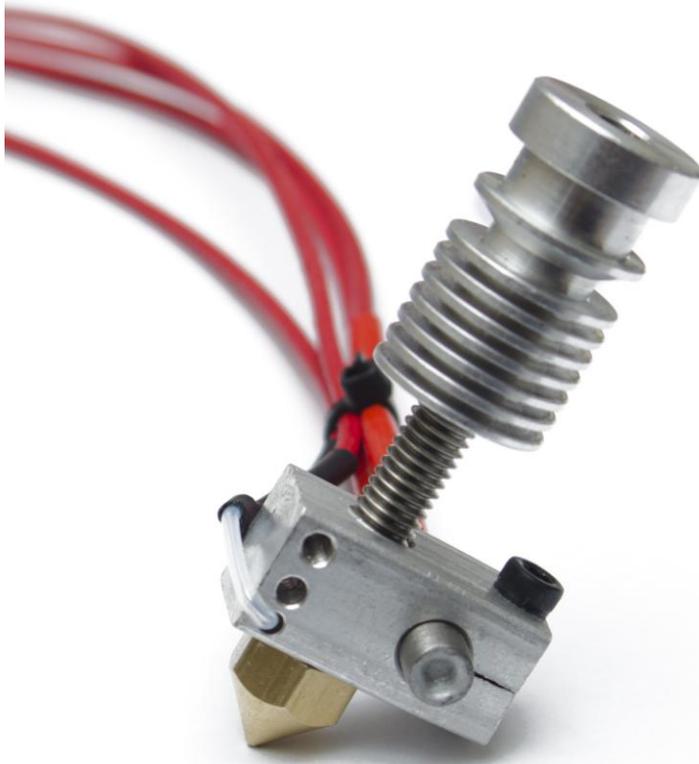




### The Aluhotend V7



In any 3D printer typically that using thermoplastic or similar materials, the plastic is ejected from a pool of molten plastic within a nozzle by the forced arrival of un-melted plastic.

The melted plastic is forced through a 0.4-0.6 mm hole as the 3D printer control mechanisms will be moving the extruder across the object being built, the ejected plastic will be laid down at 0.1-0.4 mm layer heights onto the previous layer of plastic making up the object being printed.

The nozzle typically is connected to or part of a heated block which contains a heater cartridge to raise the temperature and a thermistor to measure the temperatures so that the electronics controlling the nozzle can maintain this at the temperature required.

The structure of the Aluhotend consists of:

- A heat sink with a central hole
- A thermal barrier connecting the heat sink to the heater block
- The heater block with it's heater and thermistor
- The nozzle screwed into the heater block

The path down through the heat sink and the thermal barrier to the heater cartridge and nozzle entrance is lined by PTFE tubing.



## 3D Industries Aluhotends

The hot end sits in an extruder body the arrangement being such that the extruder either directly by means of a mounted stepper motor or indirectly through a connected Bowden tube.

The requirements of the hot end are accurate temperature control, very tight and leak proof connections between the heat sink, thermal barrier, heater block and the nozzle.

### The AluHotend components:

These are available from the 3DIndustries web site



#### The Heat Sync (Jhead compatible groove-mount)

This is a replacement heat-sink for the Aluhotend.

It comes with a hollow grub-screw in the top to allow length adjustment and will suit all previous hotends and the current V7



#### The Thermal Barrier

This is a PTFE lined thermal barrier as used in the AluhotendV7 and can be used in many other hotends with an M6 thread.

It allows the smooth and reliable extrusion of PLA and ABS

length: 35mm, Internal diameter: 2mm(1.75mm filament)



#### The Heater Block

There are three holes for thermocouples and thermistors, The main thread is M6 and the heater cartridge hole takes a 6mm heater cartridge which can be secured with a M3 X 10 cap screw



#### The Heater Cartridge

Standard 12v heater cartridge, 6mm diameter 16 -22 mm long.

It is tested for shorts between leads and shell before shipping



## 3D Industries Aluhotends

### The Nozzle



This is the brass nozzle in use in the current Aluhotend V7, it is compatible with previous versions and any other hotend that uses a M6 threaded nozzle.

Thread: M6  
Sizes available: 0.4mm,0.5mm,0.6mm

### NTC thermistor



Beta value:	3960
Dimensions:	2 Dia. x 4.2 mm
Length:	4.2 mm
Maximum Operating Temperature:	+250°C
Minimum Operating Temperature:	-40°C
Package/Case:	DO-35
Resistance @ 25 °C:	100000Ω
Temperature Coefficient Type:	NTC
Tolerance:	±10%

(Number #10 in the Marlin firmware)

## Hotend Issues

As the hole at the end of the nozzle is very small it can easily be blocked by the presence inside the plastic reservoir of dust or other containments large than the hole. This dust can either be present within the un-melted plastic or can be carried into the hot end on the outside of the filament if the filament is not cleaned as it is unwound from the spool. A partially blocked nozzle can result in poor and variable printing quality as inconsistent amounts of plastic is dispensed. A fully blocked nozzle can prevent any plastic at all from being dispensed. Depending on the extruder mechanism other problems may occur with the filament. The filament is typically driven by a hobbed wheel attached to a stepper motor that moves the filament that is pinched between it and a flat surface or bearing depending on the extruder construction. If the nozzle is blocked then no more un-melted plastic can be pushed into the reservoir and the un-melted plastic filament can be damaged by the forced movement of the mechanism.

The parts of the hot end the heater and thermistor and the connected wiring, the heater block and the thermal barrier must work continuously at controlled temperatures often above 200 C for long periods of time. The feed path of the filament must be slightly larger than the filament but allow a smooth and consistent travel. It controls the molten plastic ejection by reducing the pressure on the reservoir and when required by reversing for a short period the direction of the plastic filament travels.

There are many types and copies of hot ends in the market. Many of these are counterfeits of successful hot ends. While these may work to some extent they have not had the same development history and quality of construction and materials and testing of the structure and manufacturing methods developed over time for the best quality hot ends.



## 3D Industries Aluhotends

### 3D Industries Aluhotends

The Aluhotends developed by 3D Industries are used in Production and development printers to continuously print large volumes of plastic. During development the experiences gained in this testing and the resultant adjustments made to the product resulted in a high quality very robust and consistently efficient hot end. While some individual parts of the hot ends are sold separately (nozzles etc) and the hot end can be sold as a “bare” unit or a kit requiring the hot end and thermistor and wiring be assembled on site, it is not recommended the complete building or dismantling of the hot ends away from the 3D industries assembly location. Blocked nozzles can be replaced on site but the clearing of a blocked nozzle is generally not recommended. It is difficult to remove all traces of the plastic and contaminant from the small nozzle internals and attempts to clear the hole physically can result in an enlarged or distorted nozzle hole. 3D Industries recommend that two hot ends are assigned to each printer so that should one become blocked then the entire hotend can be quickly replaced and the faulty or damaged unit repaired locally or send back to 3D Industries. All printers’ sold by 3D industries include a spare Aluhotend and other components that can be replaced on site and is offered for sale via the 3D industries website or on eBay through the 3D Industries eBay store.

The hot ends have been shipped to most countries in the world including Russia and the Eastern bloc countries, many Asia countries, The UK Africa and Arabia. The hot ends are sold directly and through a distributor in the states.

The Aluhotend has received lots of positive feedback. See YouTube videos :

<https://www.youtube.com/watch?v=j1wDWgOr-1o>

<https://www.youtube.com/watch?v=XZWDEdypqjE>

The Aluhotends are offered for sale in the following configurations.

#### 1.75mm Aluhotend Bare

Contains:

1 x 1.75mm hotend



#### 1.75mm Aluhotend Kit

Contains:

1 x Aluhotend V7

1 x 12v 40mm 12v fan

1 x 100k thermistor 1x 100mm heat shrink tube

1 x 100mm PTFE wire sleeve 1 x 12v heater cartridge





## 3D Industries Aluhotends

1.75mm Aluhotend Prewired

Contains:

1 x Aluhotend (prewired with thermistor and heater cartridge)

1 x 12v 40mm fan

