

How to Install the Micro Swiss All Metal Hotend (Ender-3)

Last Updated November 17, 2018 by Brett



An all metal hotend is one of the absolute best upgrades you can make to any 3D Printer, it opens up a world of possibilities when it comes to exotic filaments. While the stock PTFE lined hotends on most machines are great for new users, they are limited to just the basic materials like PLA and ABS. The higher temperatures required to print other plastics will melt that tubing, which emits toxic fumes in excess of about 245° Celsius.

Unfortunately there just aren't many options available in the all metal hotend market, meaning that owners have to choose between the two big names, E3D and Micro Swiss. The good news is that both companies offer exceptional products and specialize in hotend design as their core focus. However, when it comes to Creality machines like the CR-10 and Ender-3, the Micro Swiss has the distinct advantage of being a drop-in replacement that takes a matter of minutes to install.

After using their all metal hotend on other 3D printers in the past, I reached out to Micro Swiss last week about this particular product. While it's advertised as being for the CR-10, Creality3D uses the same hotend design across most of their machines, meaning it is compatible with the Ender-3 as well. They agreed to send me a unit to check out and do an installation guide, so we will look at the steps needed for assembly and how to get the most out of this particular hotend.

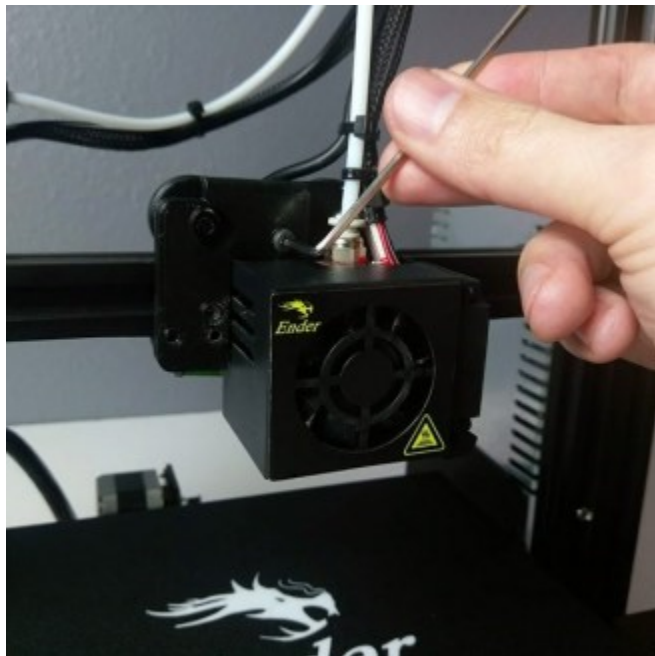
Purchased Parts List

[Micro Swiss All Metal Hotend Conversion Kit](#) - \$63.50

[Capricorn Bowden Tubing \(Optional\)](#) - \$12.50

Instructions

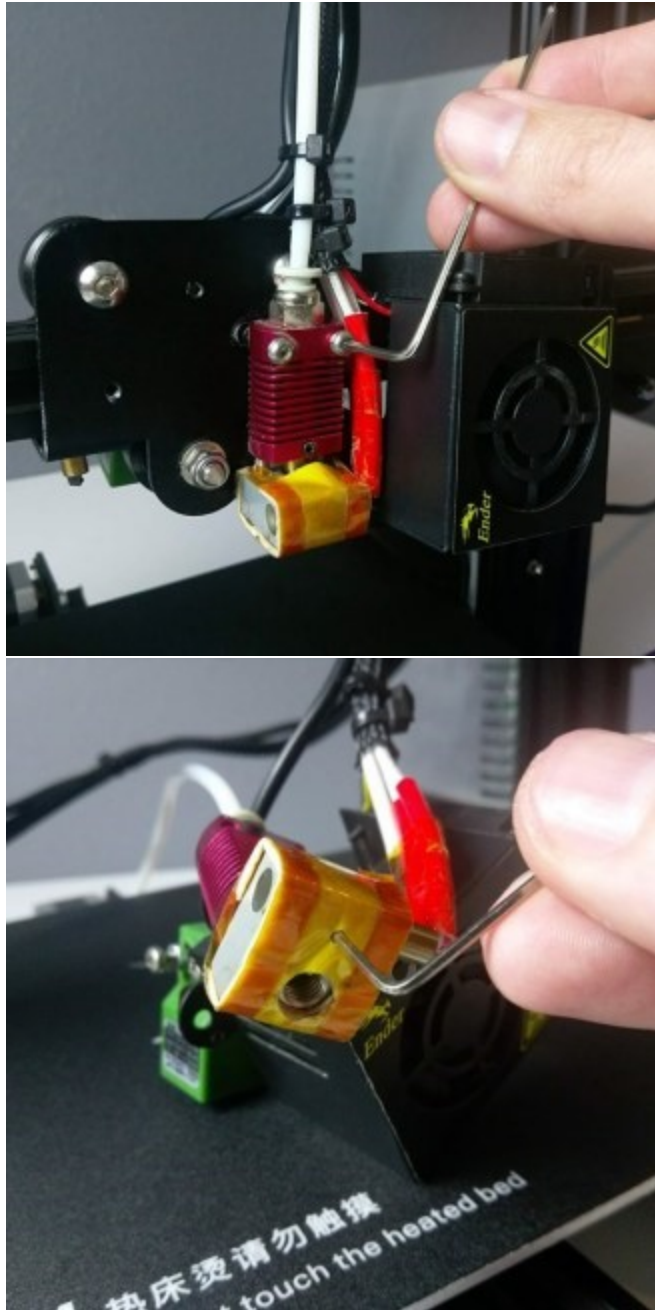
To access the hotend, we first need to remove the cover from the carriage. It's held in place by (2) bolts that are located above and to the left. As the fan wires are still attached to this piece, unscrew the bolts and swing the cover to the side, giving us the necessary space to work.





Since the Micro Swiss All Metal Hotend is a complete kit, we don't need to fuss with breaking down the original assembly. Just remove the (2) bolts from the top of the magenta cooling block, then unplug the white bowden tube by pressing down on the lip of the coupler and pulling up on the tube to release it.

Since we will reuse the heater cartridge and thermistor, we need to take these out as well. Insert the smallest hex wrench (included with the Ender-3) in to the little hole next to the nozzle, loosening this grub screw until the heater cartridge can slide free. Before pulling it out, we need to also loosen the the Phillips head screw next to the cartridge that holds the thermistor in place. Once finished, gently remove these from the heater block while making sure not to stress the wires.

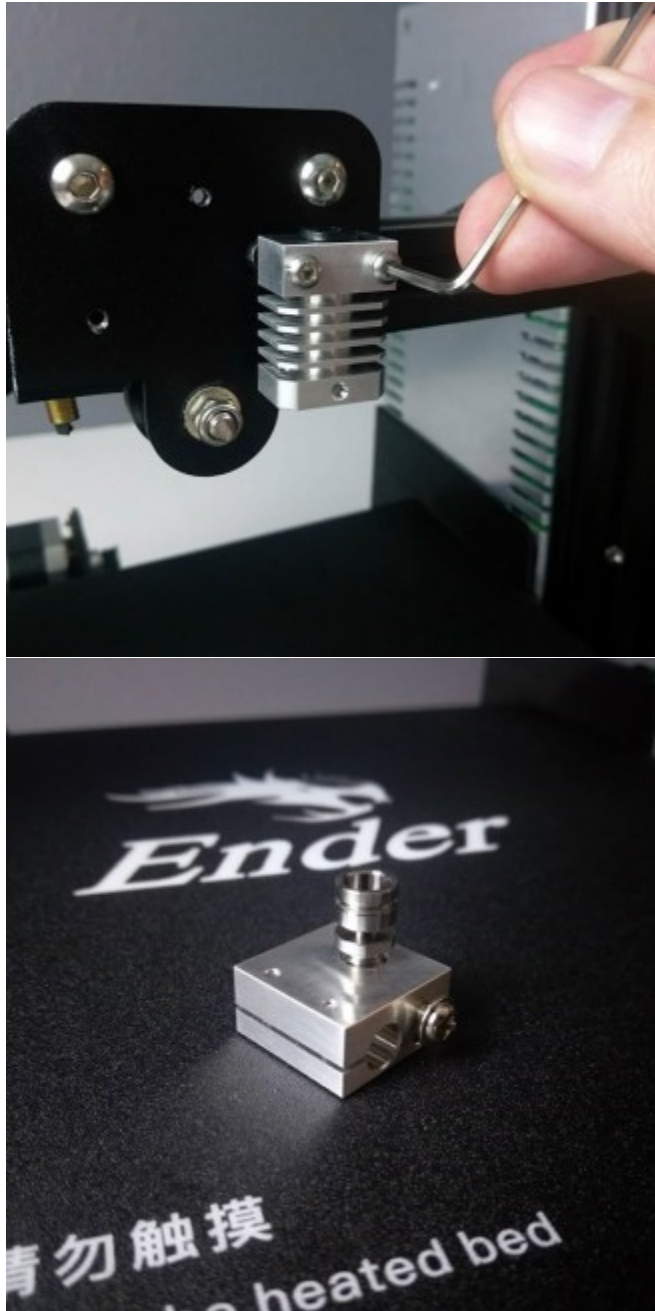


That's it, we are finished disassembling the stock hotend and can move on to the all metal hotend installation. Hold on to that stock hotend though and toss it in storage, mechanical parts can fail and it's always nice to have a backup on hand for when that happens!

Hotend Assembly Steps

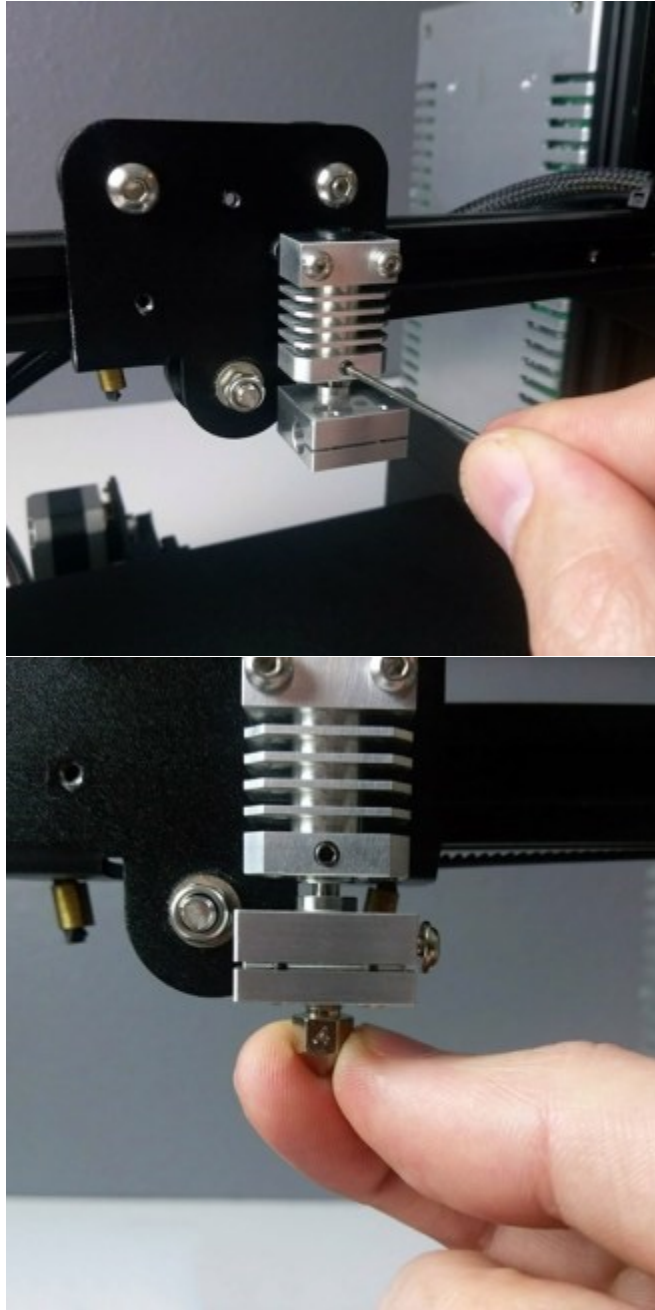
As the Micro Swiss is a drop-in solution, the parts themselves are almost identical to the original components. To get started, screw the new aluminum cooling block in to the carriage plate using the same (2) bolts we previously removed.

Now thread the titanium heatbreak in to the top of the aluminum heater block as shown in the photo below. Finger tighten this down and then use the included spanner wrench to make sure it is firmly in place.



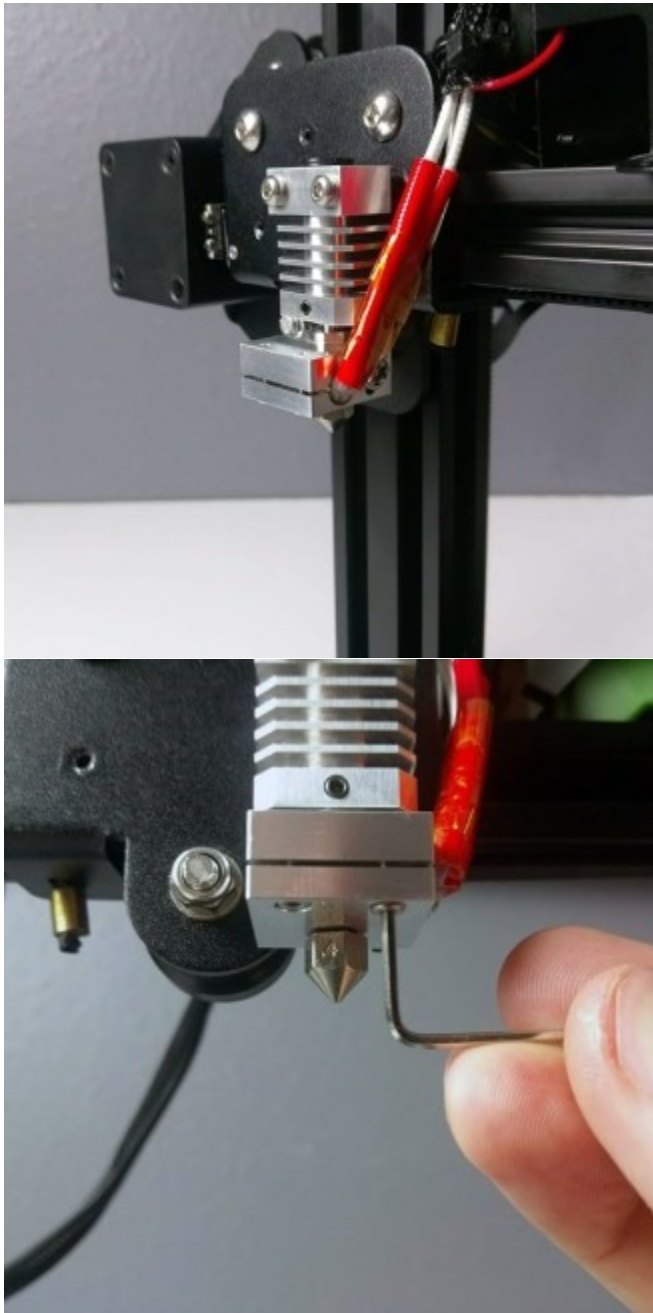
Insert the heatbreak in to the bottom of the cooling block, then use (1) grub screw from the package to clamp it in position. Press upwards on the heater block during this step to make sure it is properly seated. Any gaps left on the inside can cause the filament to leak and clog the hotend.

The kit includes a nice brass plated nozzle that is wear resistant, meaning it can handle abrasive filaments better than the traditional options. Thread this in to the bottom of the heater block and finger tighten it down. We will tighten it again later so just make sure it's in place for the time being.



With the hotend now assembled, we can go ahead and reinstall the heater cartridge and thermistor. Insert these just as they were before, making sure the thermistor's glass bead is inside of the small hole on the side. The screw that holds it in place will go between the two white wires, but only tighten this down enough to keep the bead from coming out while in use.

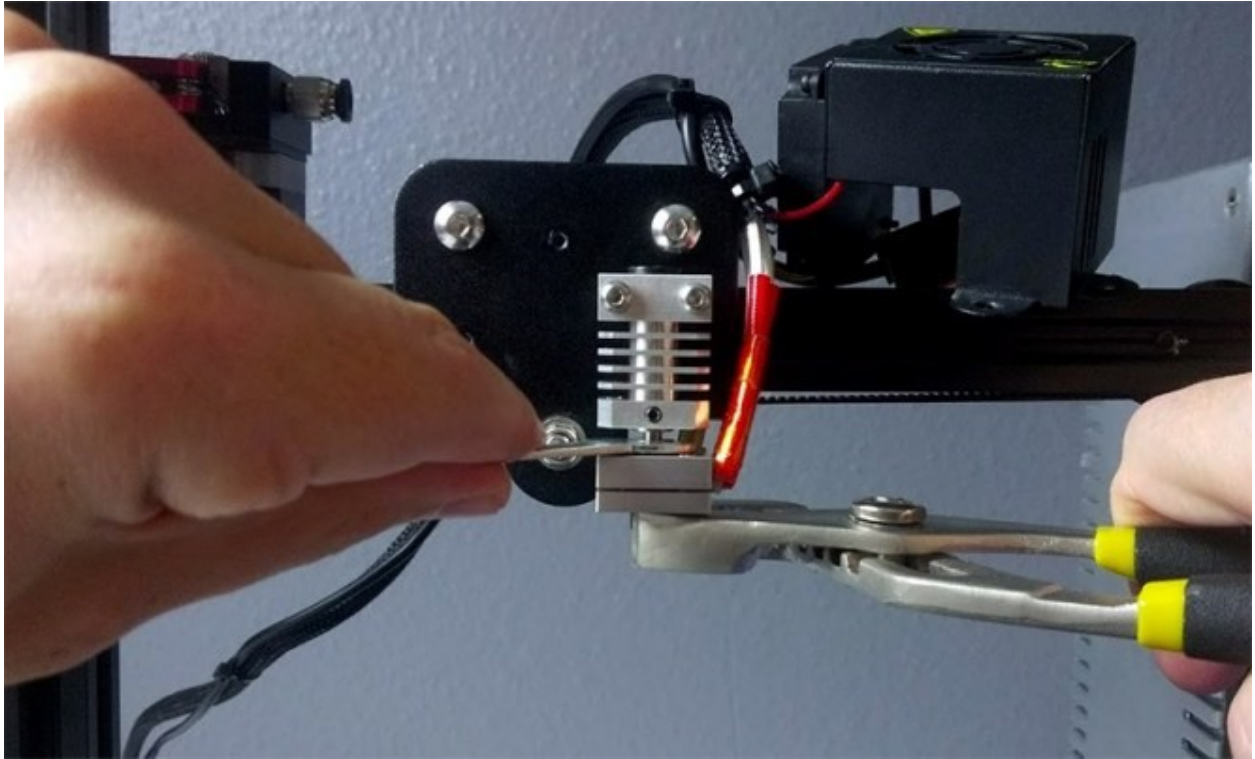
Tighten the (2) set screws on the bottom of the heater block as well, where these will clamp the heater cartridge in place.



IMPORTANT: To finalize the installation, we must tighten the hotend while it is heated up to temperature. This is the absolute most common mistake that owners make during assembly, which results in clogs and jams due to gaps between the nozzle and heatbreak.

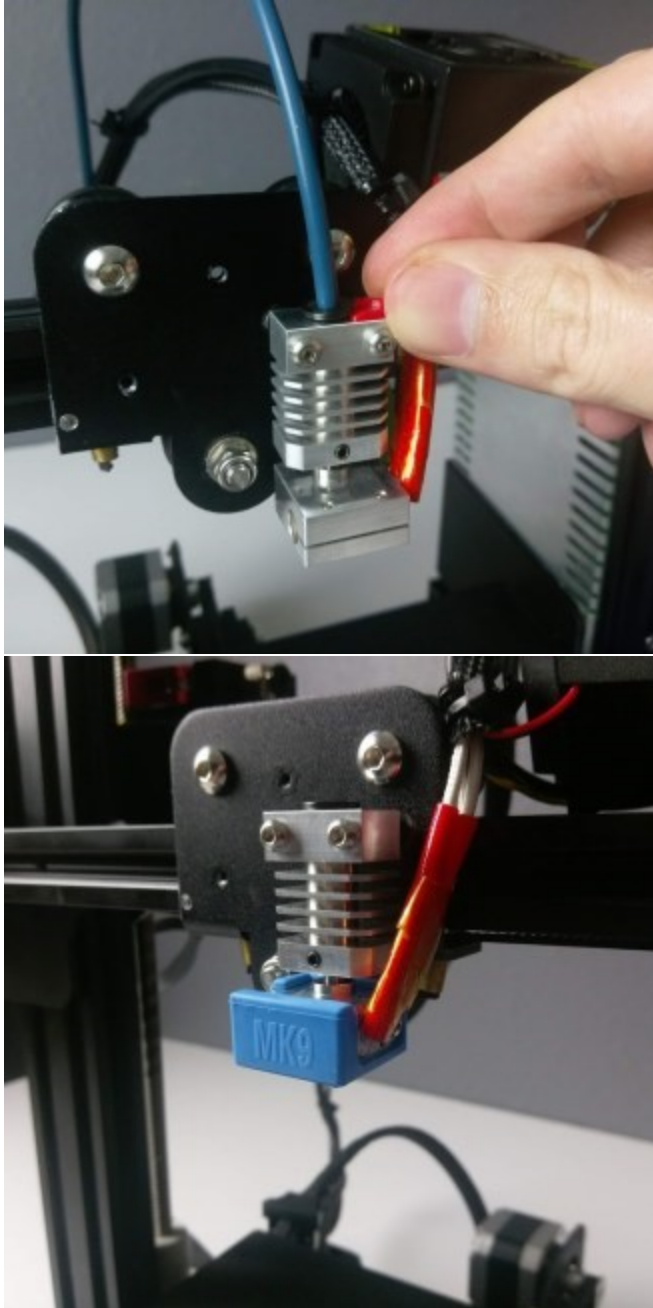
1. Turn on the machine and pre-heat the nozzle to 250° Celsius.

2. Place the spanner wrench on the heatbreak and a 7mm socket wrench on the nozzle.
3. Hold the heatbreak in place while tightening the nozzle, turn it counter-clockwise.
4. Cool down the machine and power off.

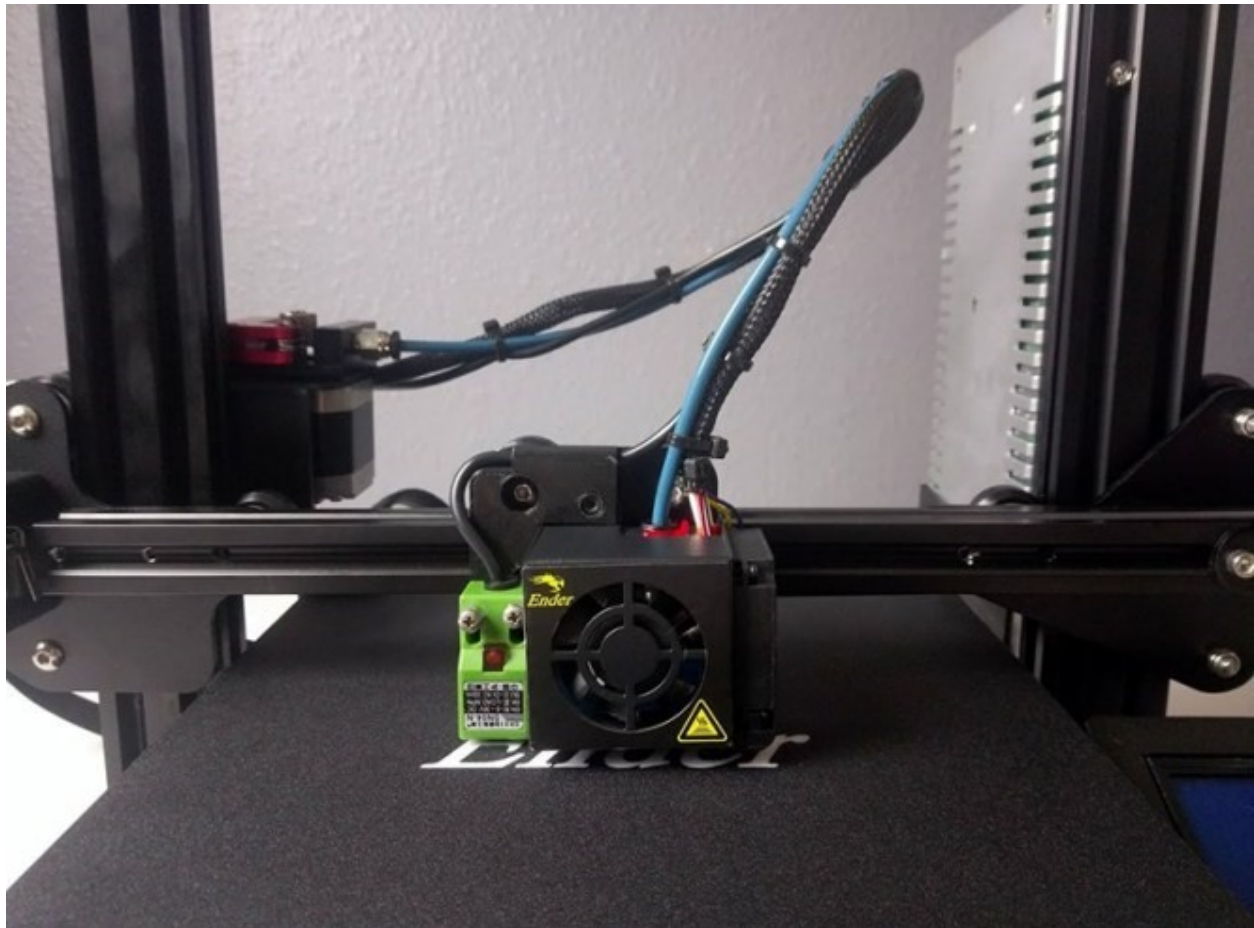


Once the hotend has cooled down, we can go ahead and wrap things up. Insert the bowden tube in to the top of the cooling block, pushing it down until it is firmly seated. Take one of the red clips from the package and push it under the black fitting, this will grip the tube and hold it in place.

As an added extra, a silicone sock has also been included in the package, where this helps to insulate the heater block and maintain stable temperatures. Position it as shown in the photo below (text faces out) and ensure the upper lip conforms to the block so that it has a snug fit.



Double check that everything looks correct and bolt the cover back on to the carriage, we're finished with the installation!



Final Thoughts (All Metal Hotend)

As a long time fan of Micro Swiss products, there was no doubt in my mind that this all metal hotend would meet my needs. It is a bit on the pricey side, albeit still cheaper than an authentic E3D V6 hotend, and the fact it's a drop-in solution should not be overlooked.

An all metal hotend isn't for everyone of course, it can have a bit of a learning curve and may take some work to figure out. For those that are just printing in PLA, the stock hotend is actually a better choice in most cases. But when it comes time to print high temperature, exotic filaments on the Ender-3 or other Creality3D machines, this is hands down the best option on the market.

[Guide: How to Upgrade the Extruder \(Ender-3\)](#)

[Guide: How to Setup Auto Bed Leveling \(Ender-3\)](#)

For those looking to do a complete Ender-3 hotend upgrade, I would recommend checking out these guides as well. An all metal extruder setup compliments the all metal hotend well, capable of higher precision steps that prevent extrusion problems. An Auto Bed Leveling (ABL) sensor, the green box on my hotend, is also a great addition for any serious 3D Printing. This probes the bed before starting each print, eliminating the need for manual leveling and even compensates for warped/bowed build plates.