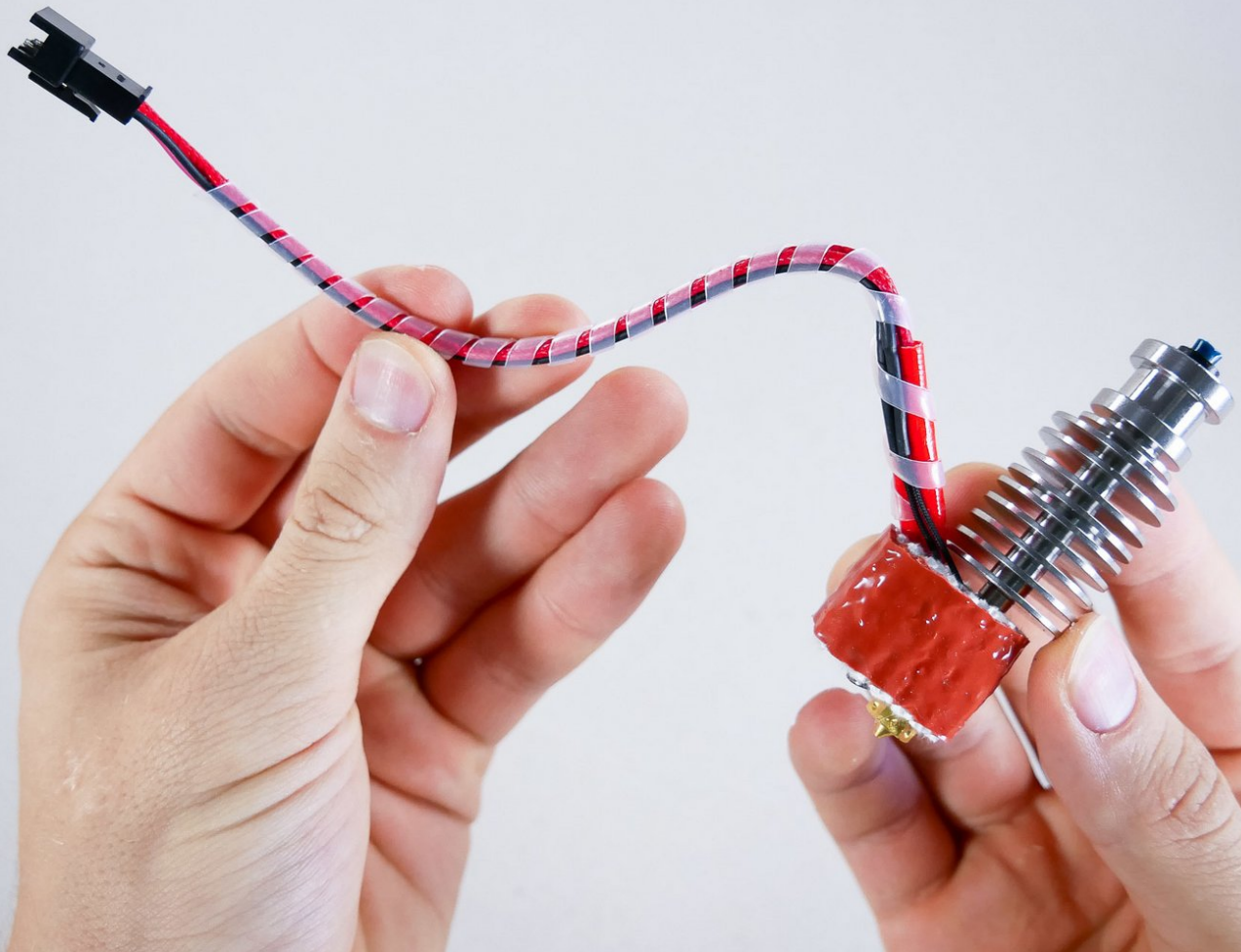




Assemble the HotEnd



INTRODUCTION

Not the guide you are looking for?

Go back to the [← Makers Kit Build Flow](#).

JellyBOX uses a genuine E3D-Lite6 HotEnd with our own heat block upgrade for faster and easier printing.

E3D hotends are the most popular hotends in the world - and the most 'cloned' ones, too. We use only genuine E3D parts manufactured in Great Britain - the quality is miles ahead of the atrocious Chinese clones - and our own parts that we manufacture in the Czech Republic to our own quality standards.

Parts of this guide are assimilated from [E3D's instructions](#) (the 'old' documentation).

PS: The British use 'aluminium' for 'aluminum' = it's the same thing :-)

Parts Used

Metal Parts

1 x Stainless Heatsink (Contains embedded PTFE tube coupling (Black Plastic Collet)
pre-fitted on top)

1 x Custom 20mm Heat Block

1 x Long Volcano Style Brass Nozzle (0.4mm)

Electronics

1 x 100K Semitec 104GT2 NTC thermistor

1 x 12v Heater Cartridge

(the heater cartridge already has pre-crimped wires including parts of thermistor
wires)

2 x 0.75mm Ferrules - for Solder-Free Wire Joins

Fixings

1 x M3x3 socket buttonhead screw and M3 washer to clamp thermistor. This is the
teeny tiny screw.

1 x M3 set screw to fix the heat element

Misc

1 x Hotend Sleeve (fiberglass + red silicone)

1 x PTFE tubing

What you need

- Vise grip OR ?? 16mm Spanner, or medium sized adjustable spanner capable of 16mm.

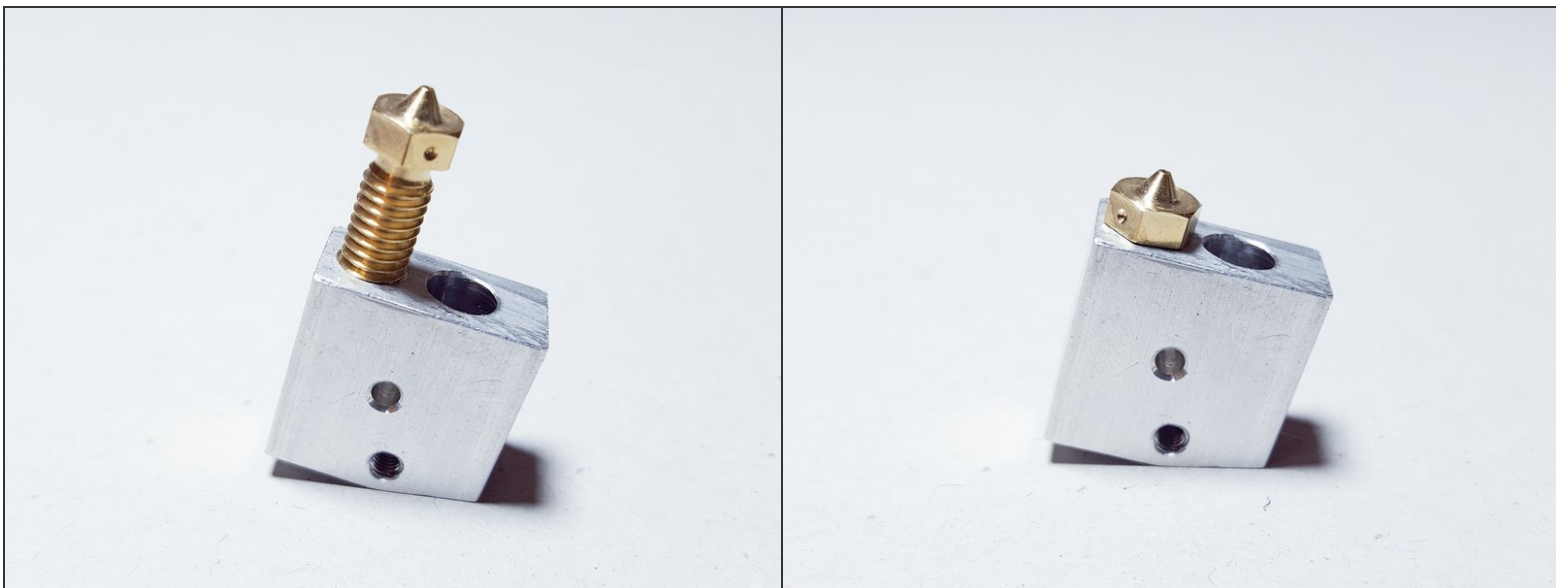
- IMADE3D wrench OR 7mm Spanner OR Nut Driver.
- M2.5 Hex Key- that's the middle sized one
- Snips, Wire Cutters
- Razor sharp knife. 'X-acto' or 'Stanley' types are ideal. Katana may or may not

be ok.

Warnings - Please Read!

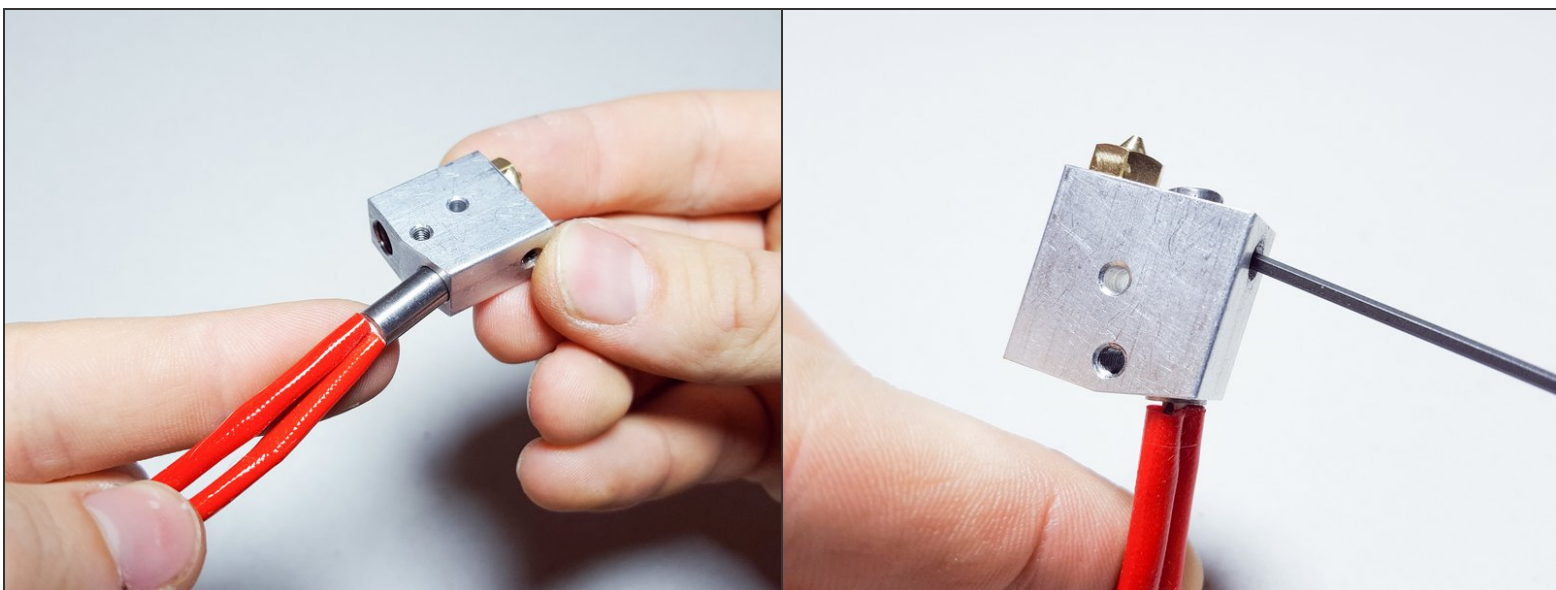
You are dealing with **high temperatures** - the HotEnd gets hot, and may be off your printer when you do the initial tightening. If you touch it, you will get **burned!**

Step 1 — ↳ Heat Block



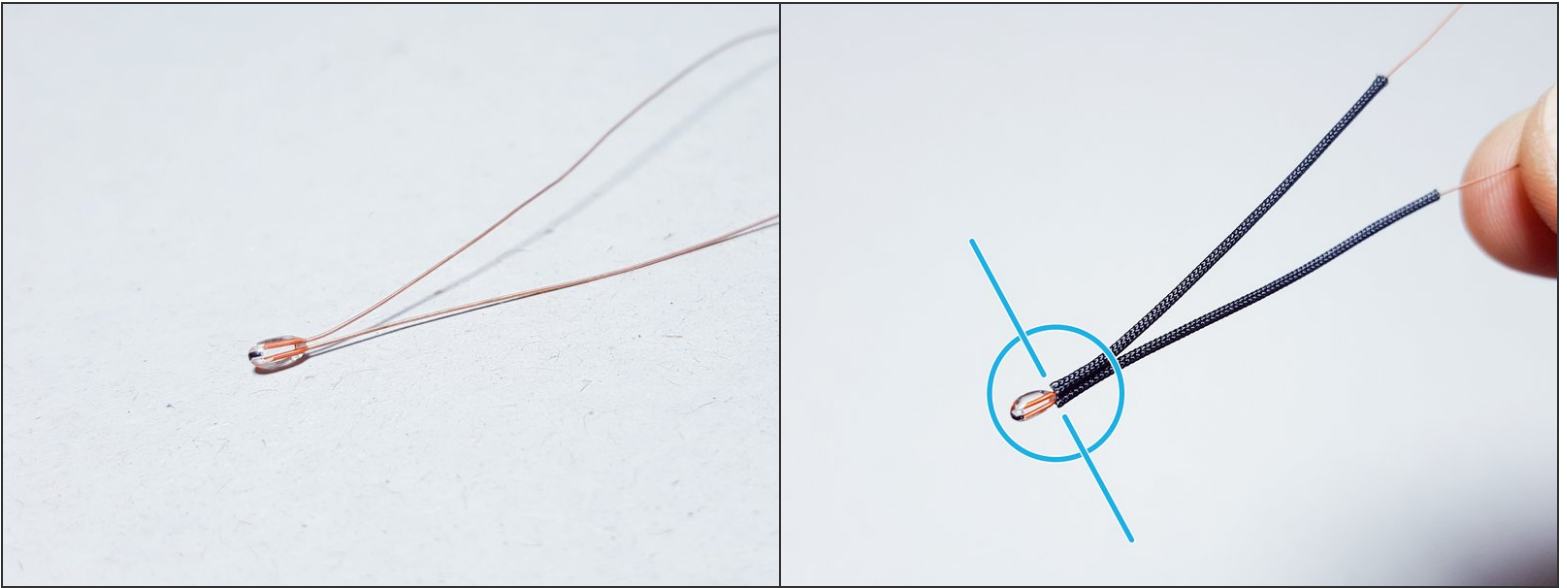
- Do not tighten.


Step 2



- Secure the heater cartridge with an M3 set screw.

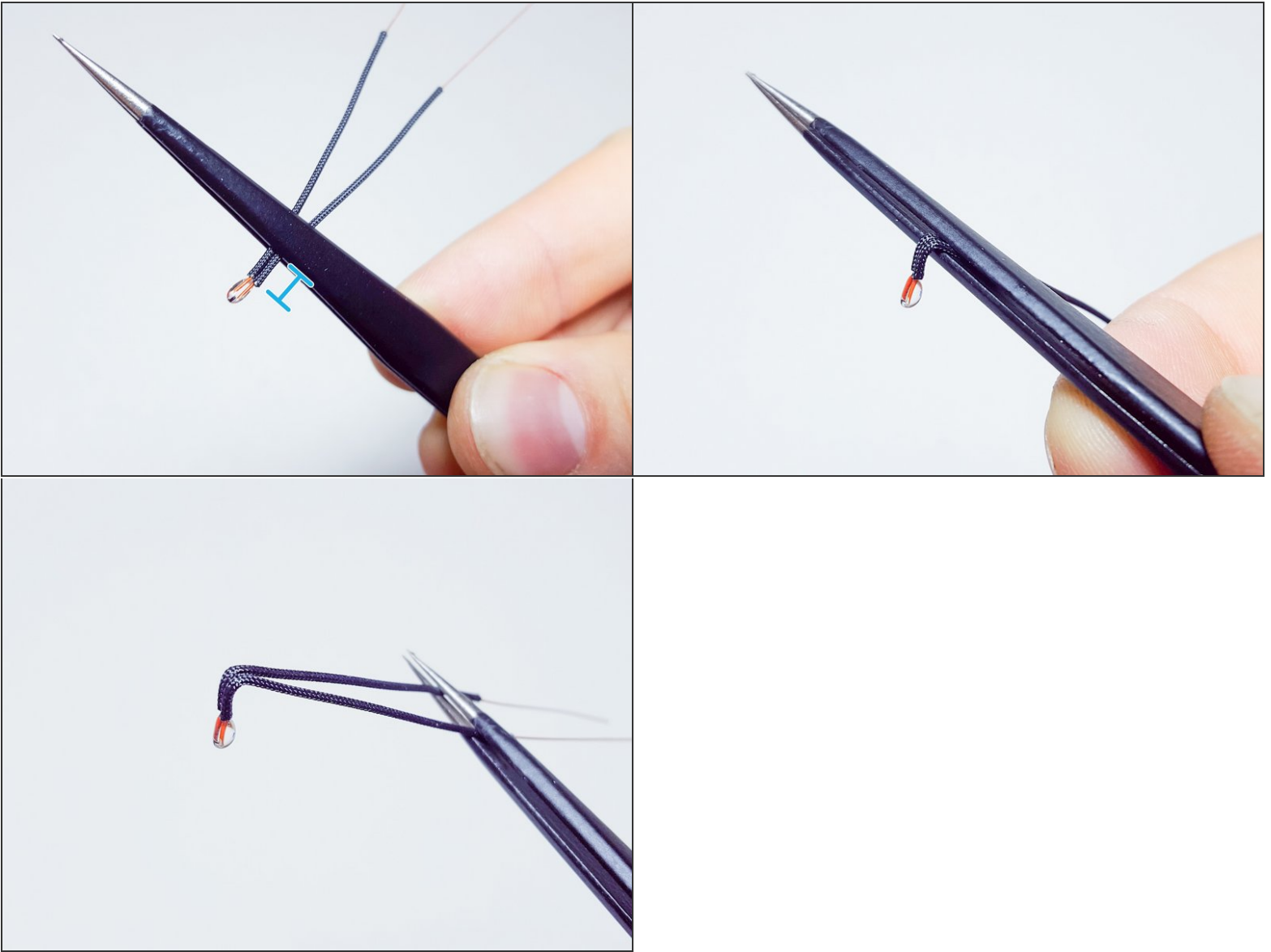
Step 3



 The thermistor is small and fragile. Be gentle with the legs. The thermistor bead is made of glass - don't crush it!

- Slide the glass-fiber high temperature sleeving onto the legs of the thermistor. Make sure to get the sleeving all the way right up against the glass bead.

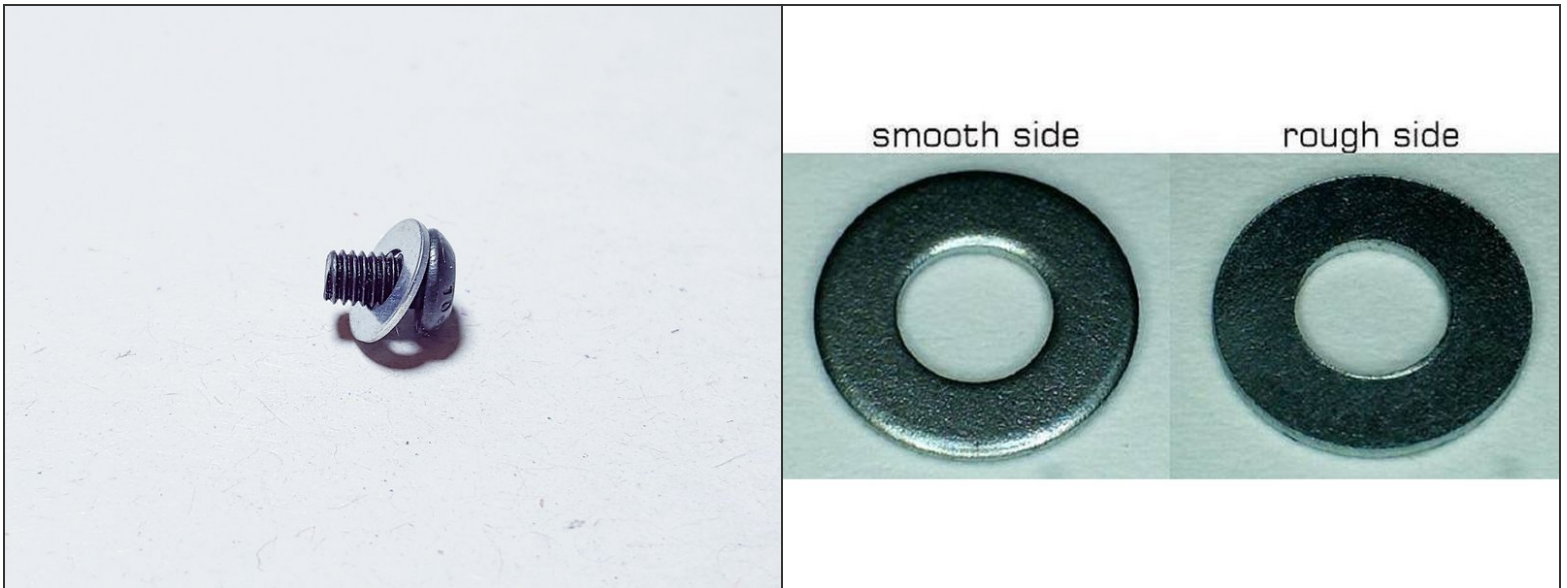
Step 4



- Bend the thermistor legs 90 degrees about 2-3mm behind the glass bead.

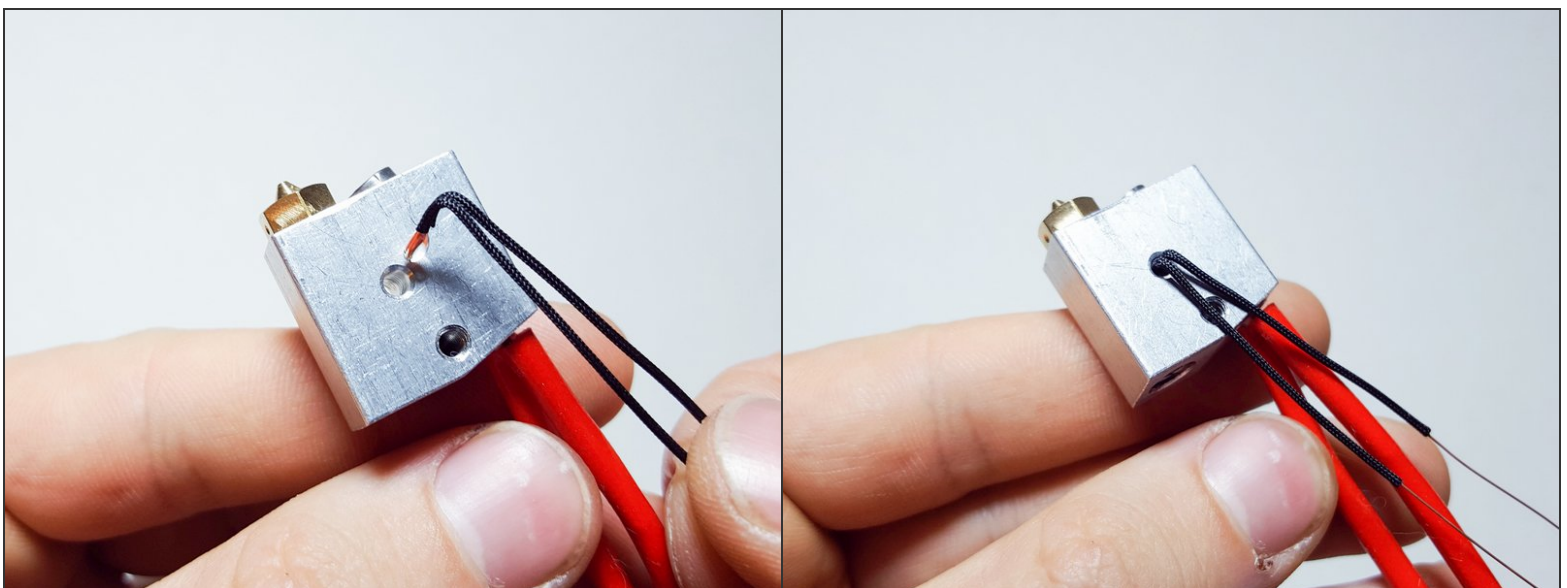
⚠ The legs must be fully insulated next to the bead. Careful about the sleeving - it will want to slide away. Keep it right against the bead.

Step 5

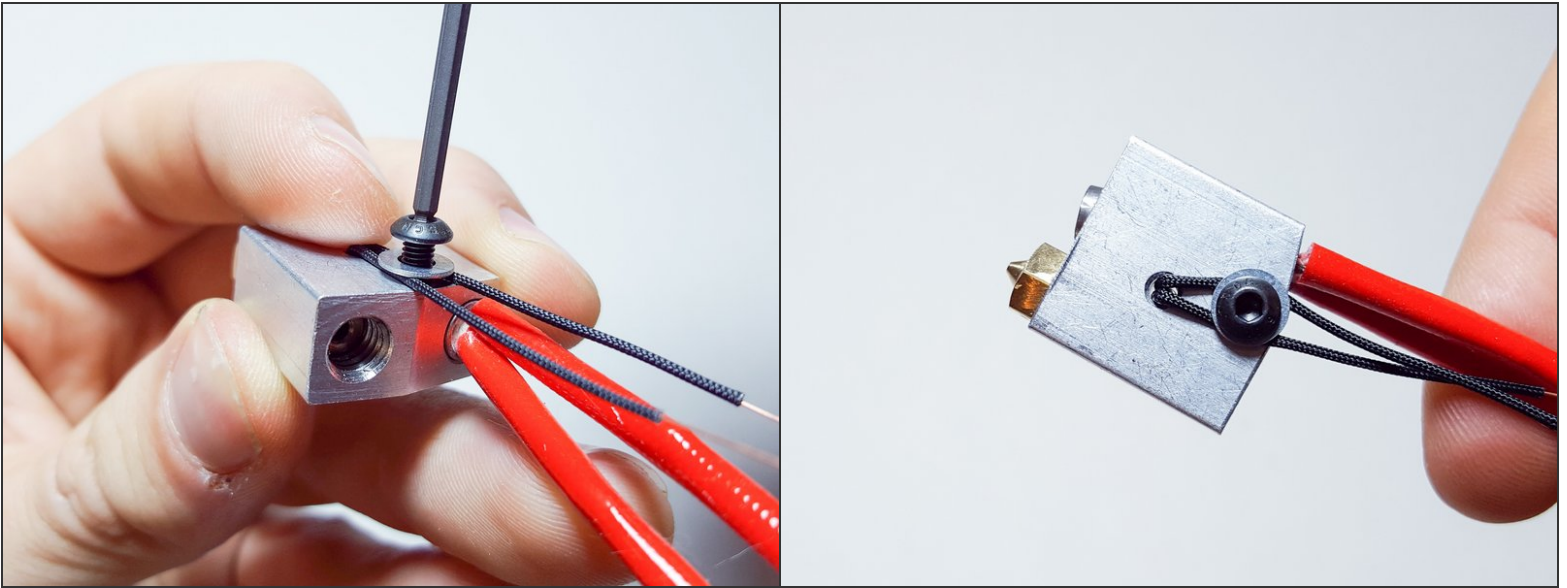


- i** Due to the manufacturing process, washers often have slightly sharper edges on one of their sides.
- Make sure to have the smooth side facing away from the screw head - this way the **smooth** side will be against the sleeving and won't damage the insulation.
 - M5x5 button head screw.

Step 6



Step 7



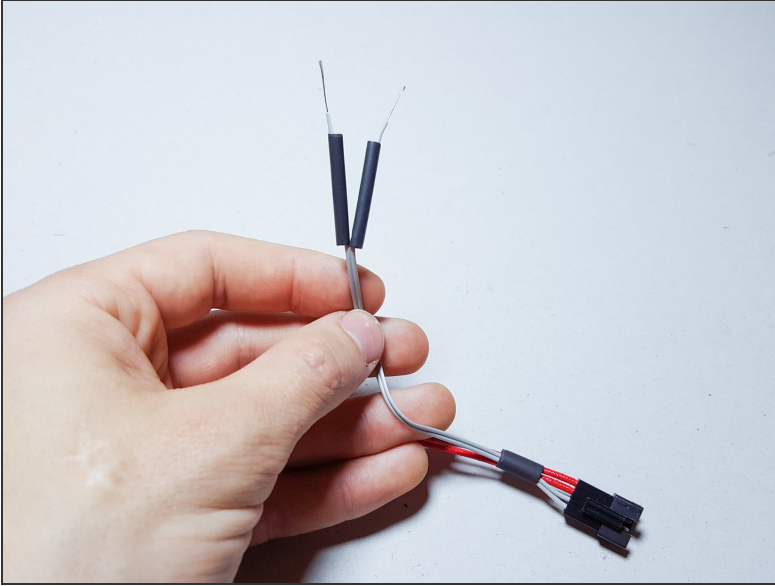
- Secure the thermistor in place with the buttonhead screw.

⚠ Don't overtighten - you don't want to damage the insulation and short-circuit the thermistor.

⚠ Visually check that the sleeving is insulating the legs of the thermistor right down to the bead.

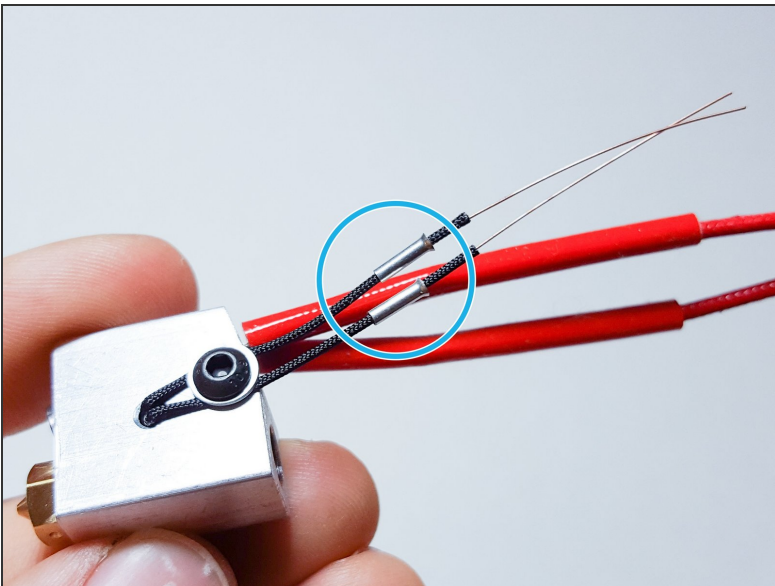
ⓘ If the legs make electrical contact with the block or each other your temperature readings will be incorrect and you risk overheating.

Step 8



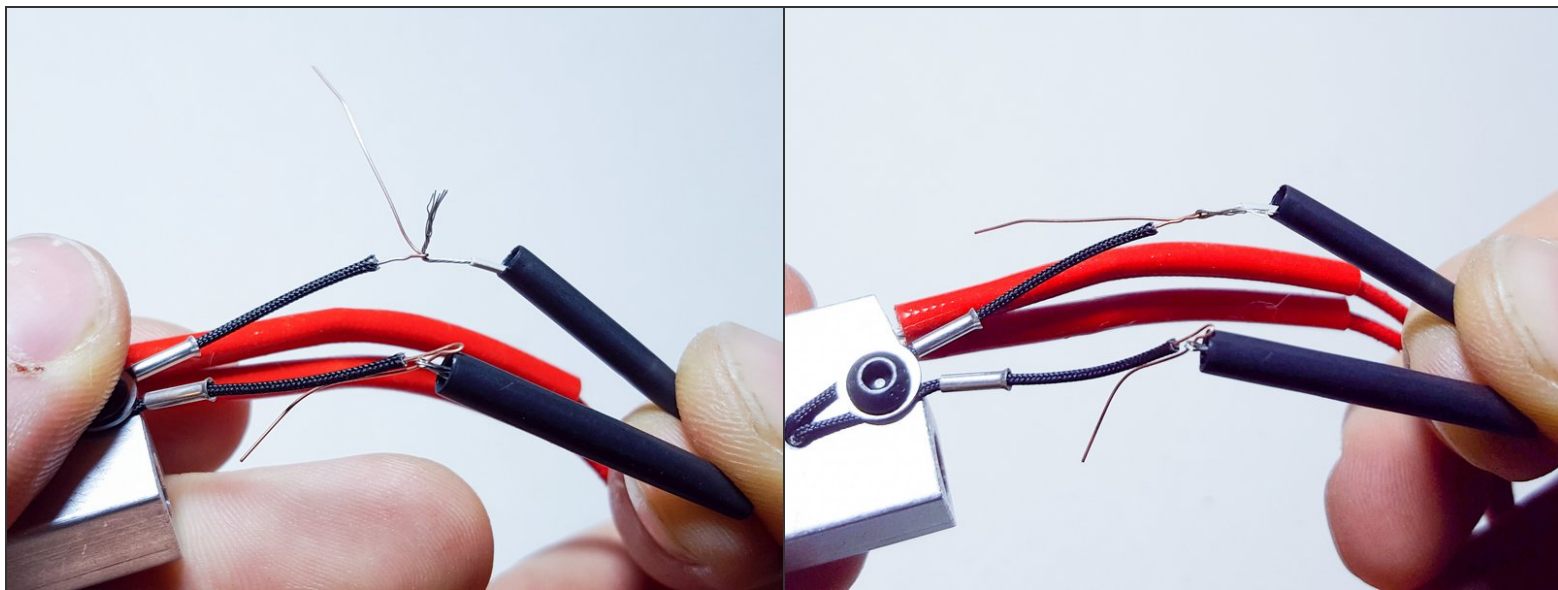
- Split the thin double wire about 5cm and slide heatshrink pieces on both legs.
- Strip about 1.5cm (1/2") of insulation from the wire ends. Use a wire stripper, knife, snips, scissors, fire, teeth, or a combination of these.

Step 9



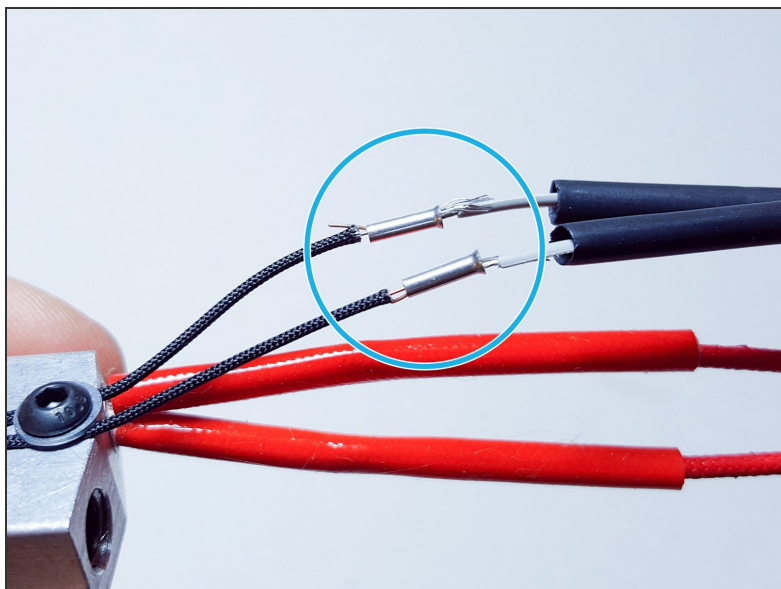
- Slide on two ferrules onto the thermistor legs.

Step 10

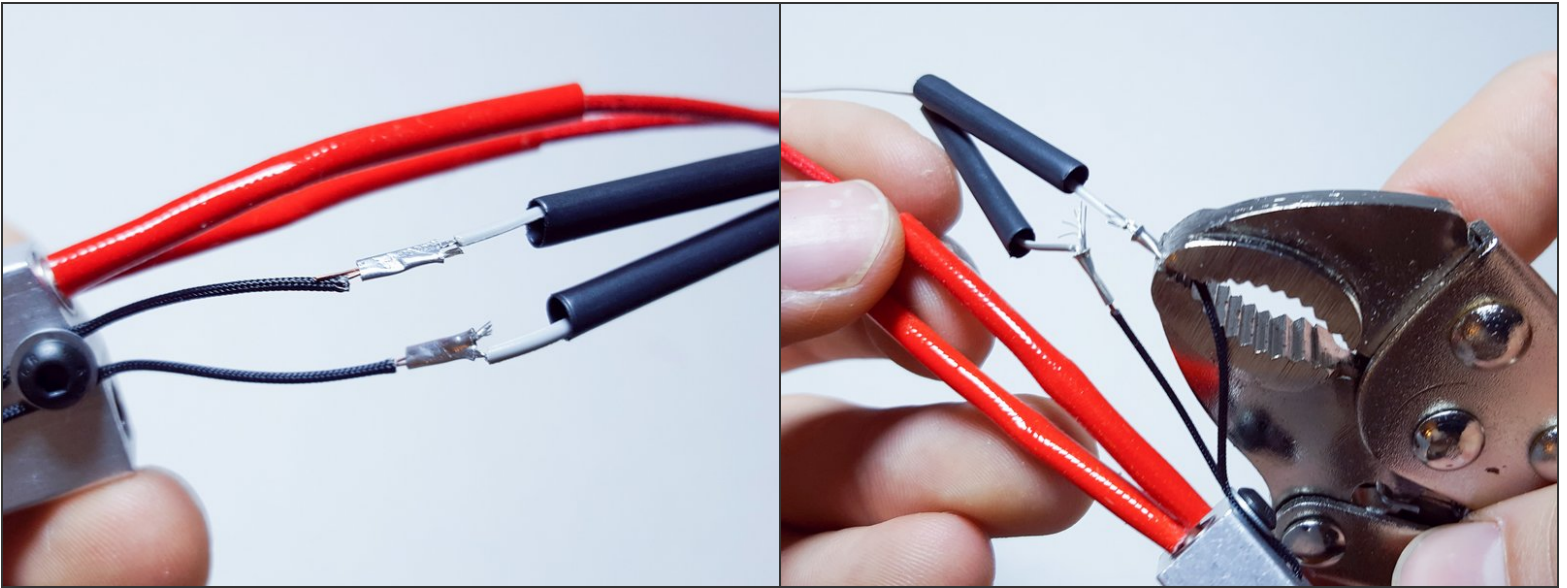


- It does not matter which wire is which. The thermistor does not care about plus and minus.

Step 11

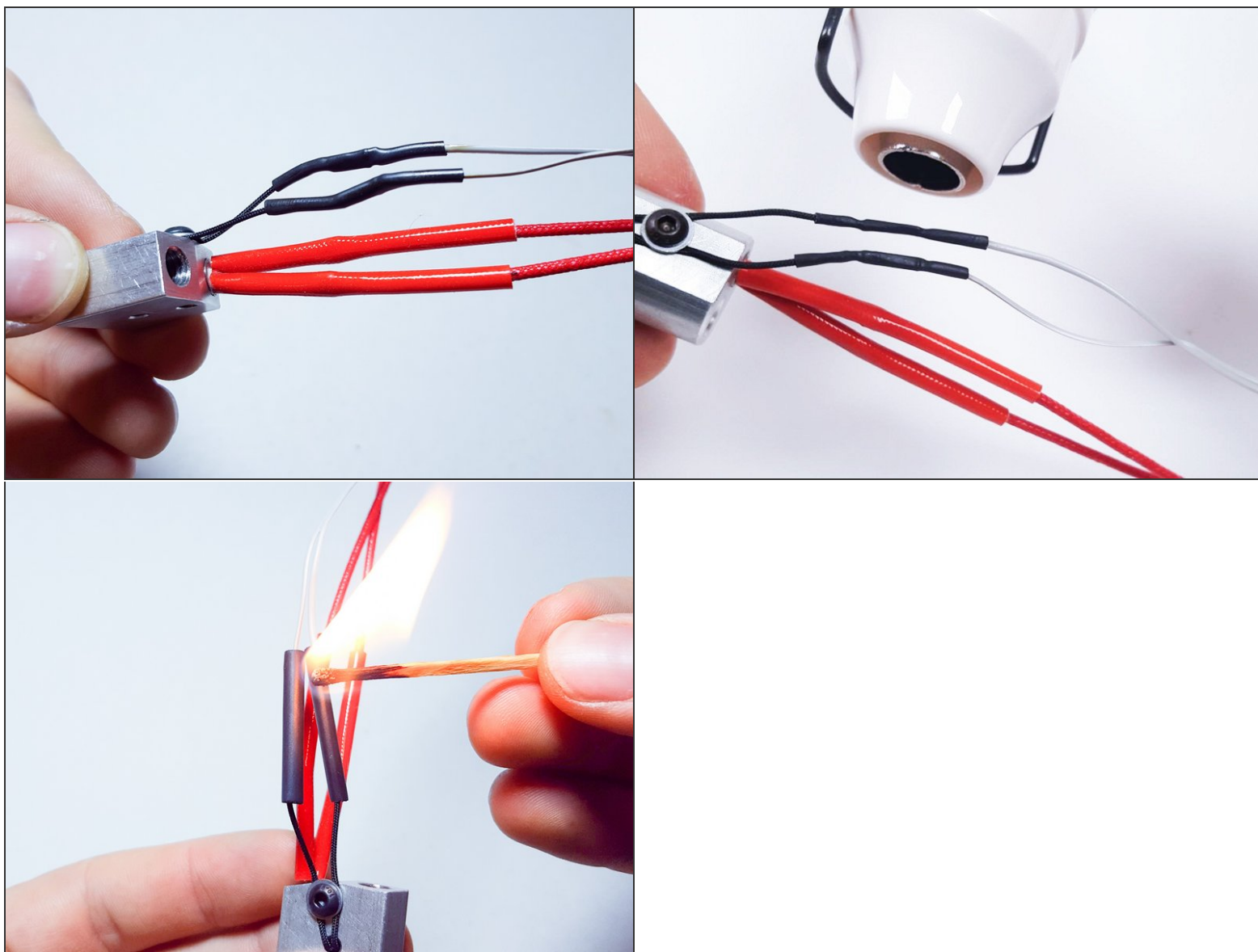


Step 12



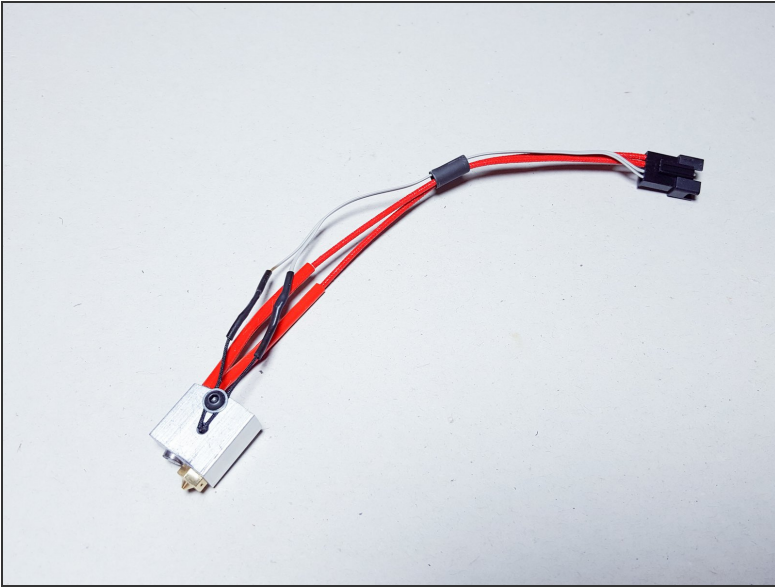
- Crimp the ferrules by firmly crushing them with a pair of vise grips/ pliers.
- You can use a fancy ferrule crimping tool if you have one, but it's not needed.

Step 13

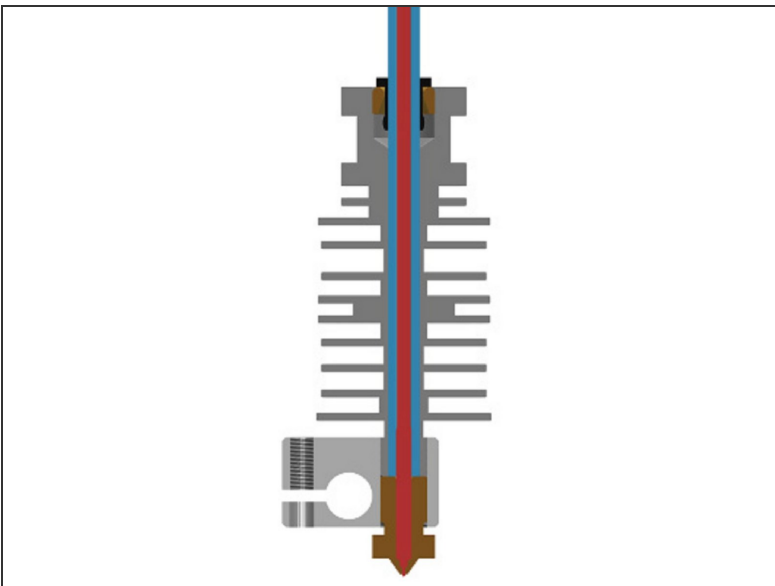


- Slide the heatshrink down over the now crushed ferrules and shrink into place with a heat source such as a soldering iron, hot air gun or a flame.

Step 14 — Looking good!



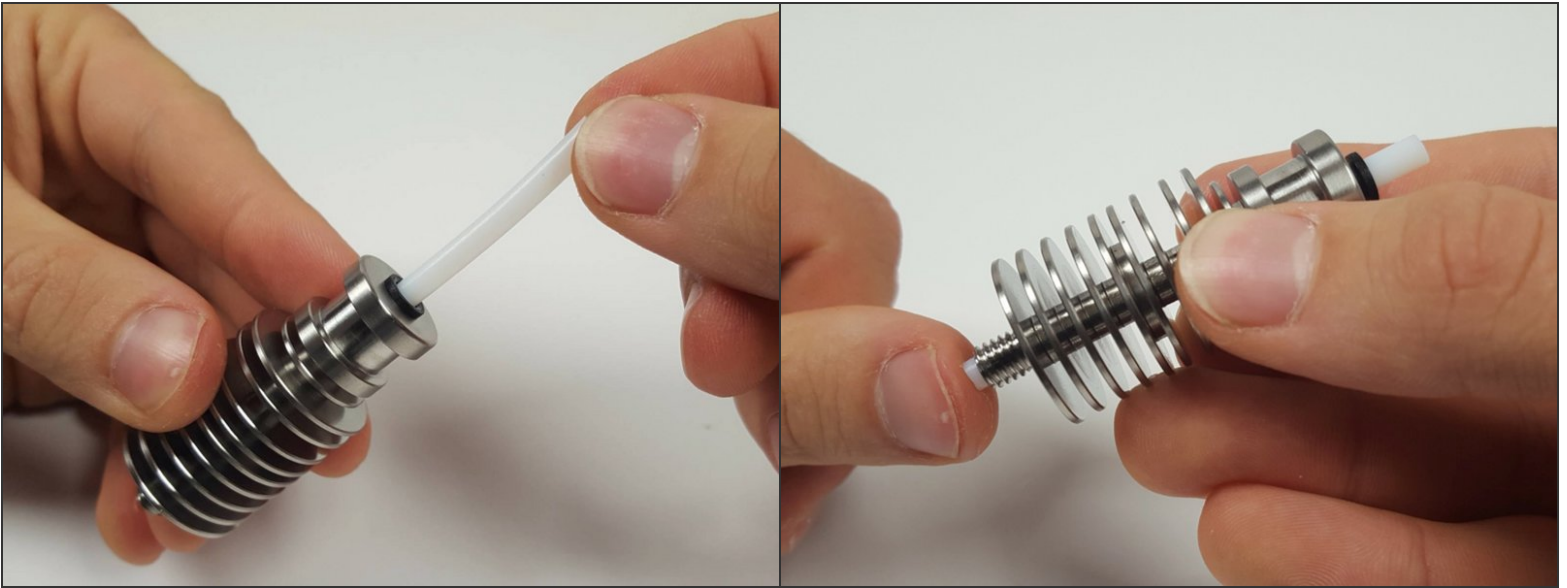
Step 15 — PTFE Tubing, Guidance




 The PTFE tubing is **mandatory**, you must use the tubing or the HotEnd will not function properly.

- The tubing should be inserted from the top of the now assembled hotend and pushed as far down into the hotend as possible at all times.
- The end of the tubing that is inserted into the hotend must be cut cleanly and squarely with a razor.
- To release the tubing from the heatsink simply press down on the black collet in the top of heatsink while pulling on the tubing.

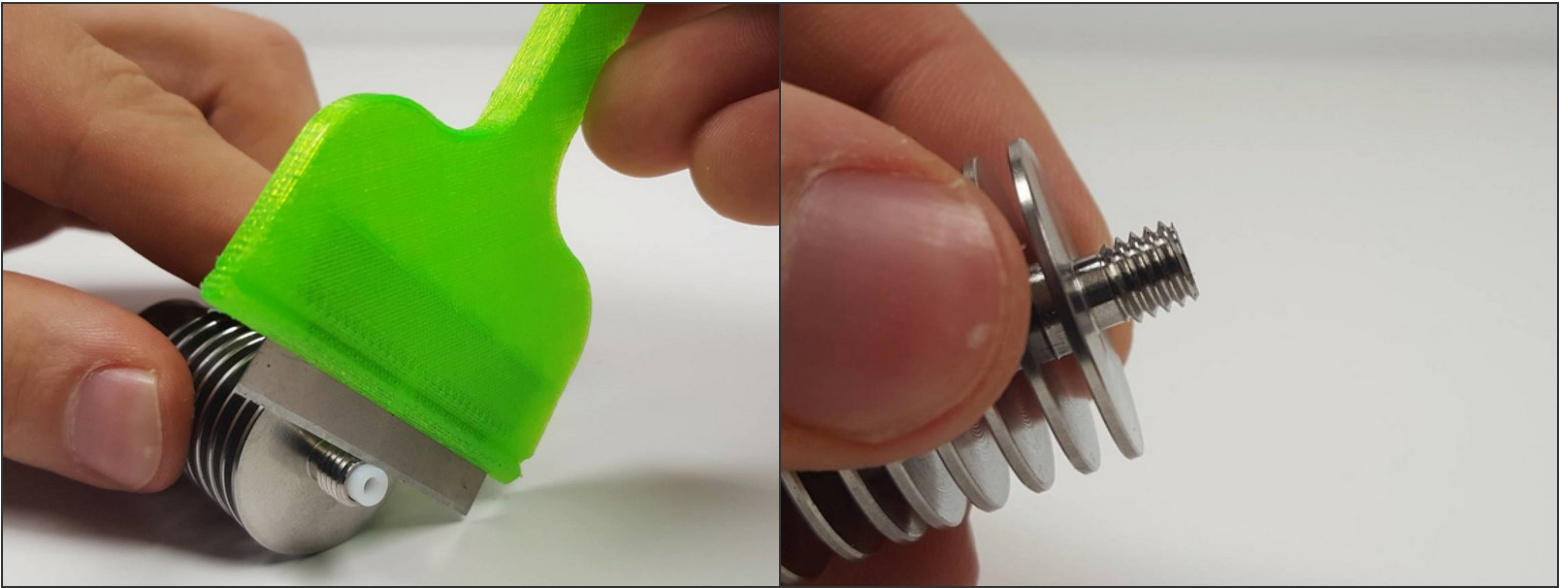
Step 16



 Note: As of summer 2018, we ship our hotends with a premium high-temperature **blue** PTFE tubing. Rejoice.

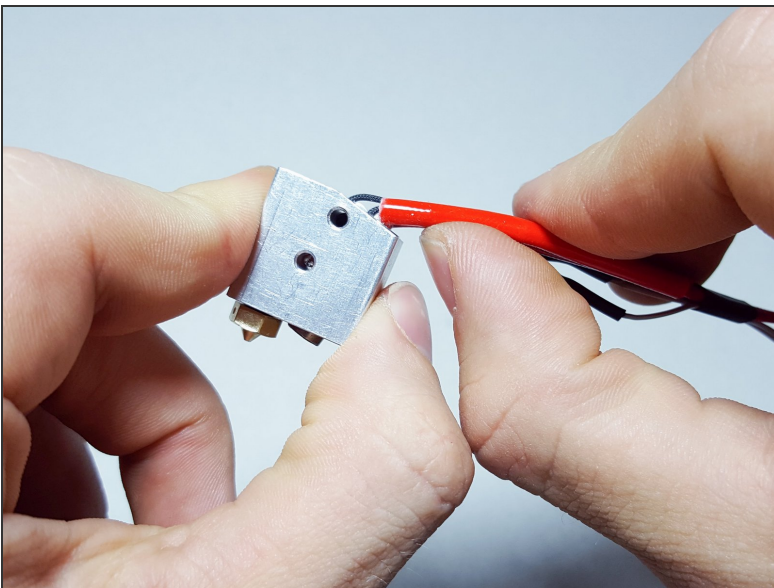
- Inset the PTFE tube all the way through.
- Then, push it back up (as much as the black collet on top rises) so that about 2mm of the tubing ends up sticking out of the threaded end.

Step 17



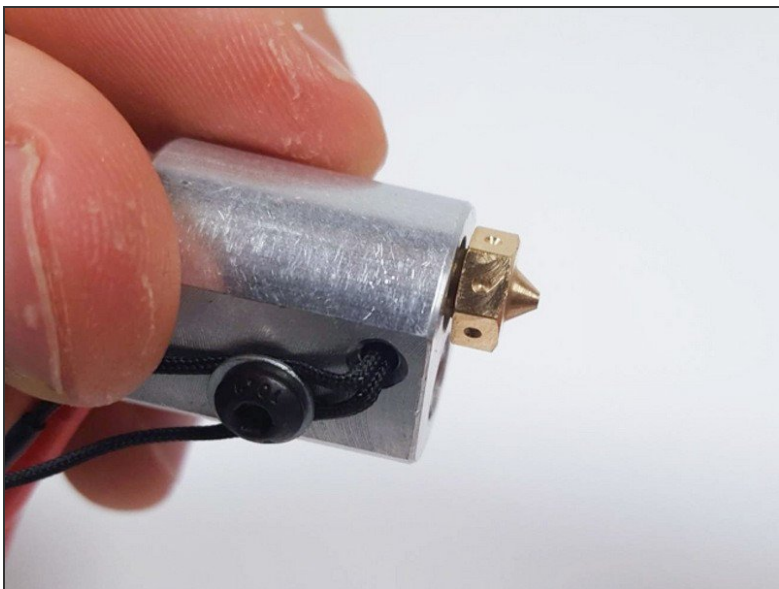
- ❗ The PTFE guides the filament from the cold side of the heatsink right down into the hot nozzle. For it to do so effectively it must butt up against the nozzle squarely and be positively secured in that position.
- Cut the PTFE squarely against the stainless heatsink with a razor blade, x-acto knife, or other very sharp cutting instrument.

Step 18



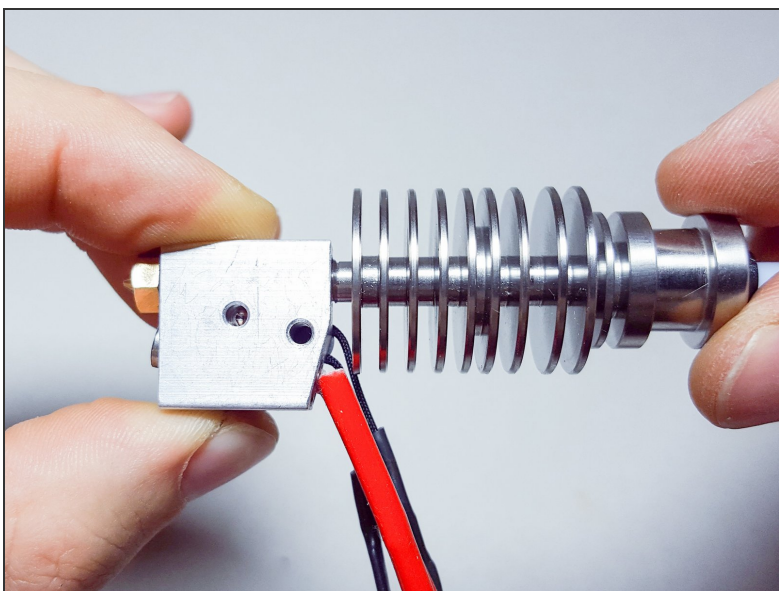
- Gently bend the red heat cartridge wires at about 90 degree angle straight back (see picture).

Step 19 — Heatsink P.1



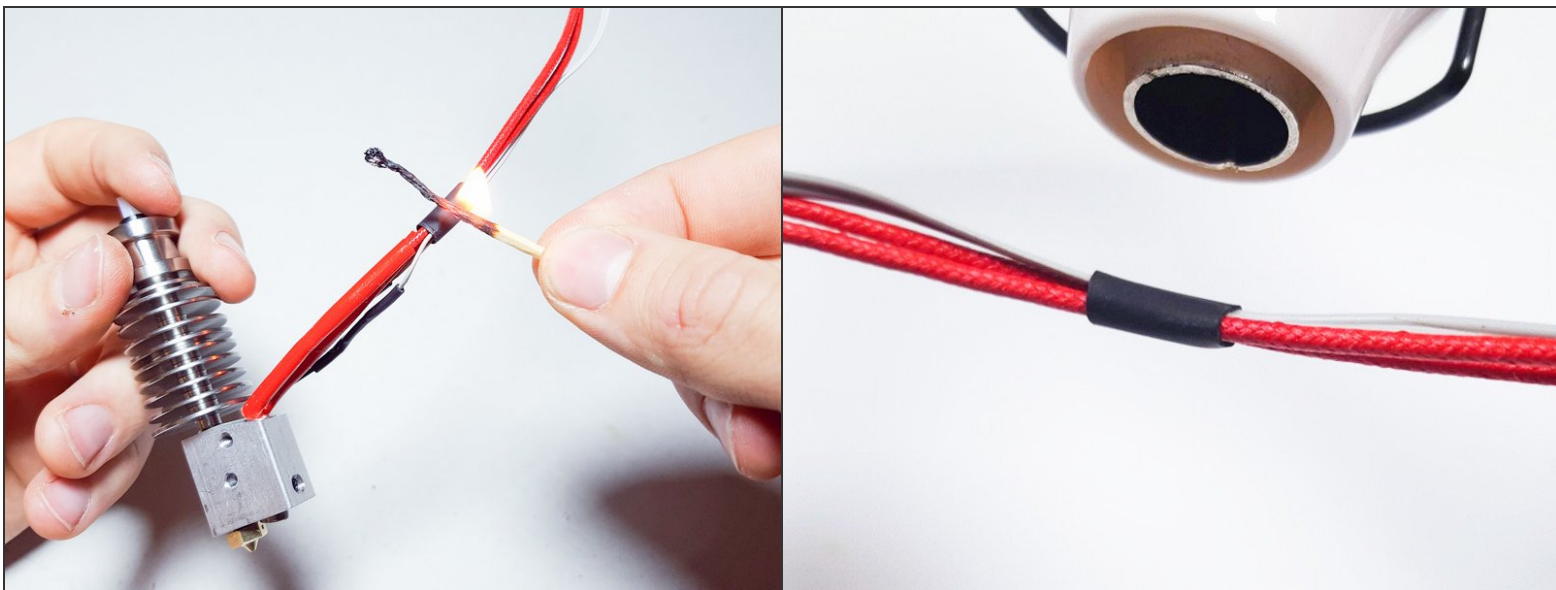
- Unscrew the nozzle about 1/2 of a turn (180 degrees) to create a small gap between the nozzle and the heatblock.

Step 20



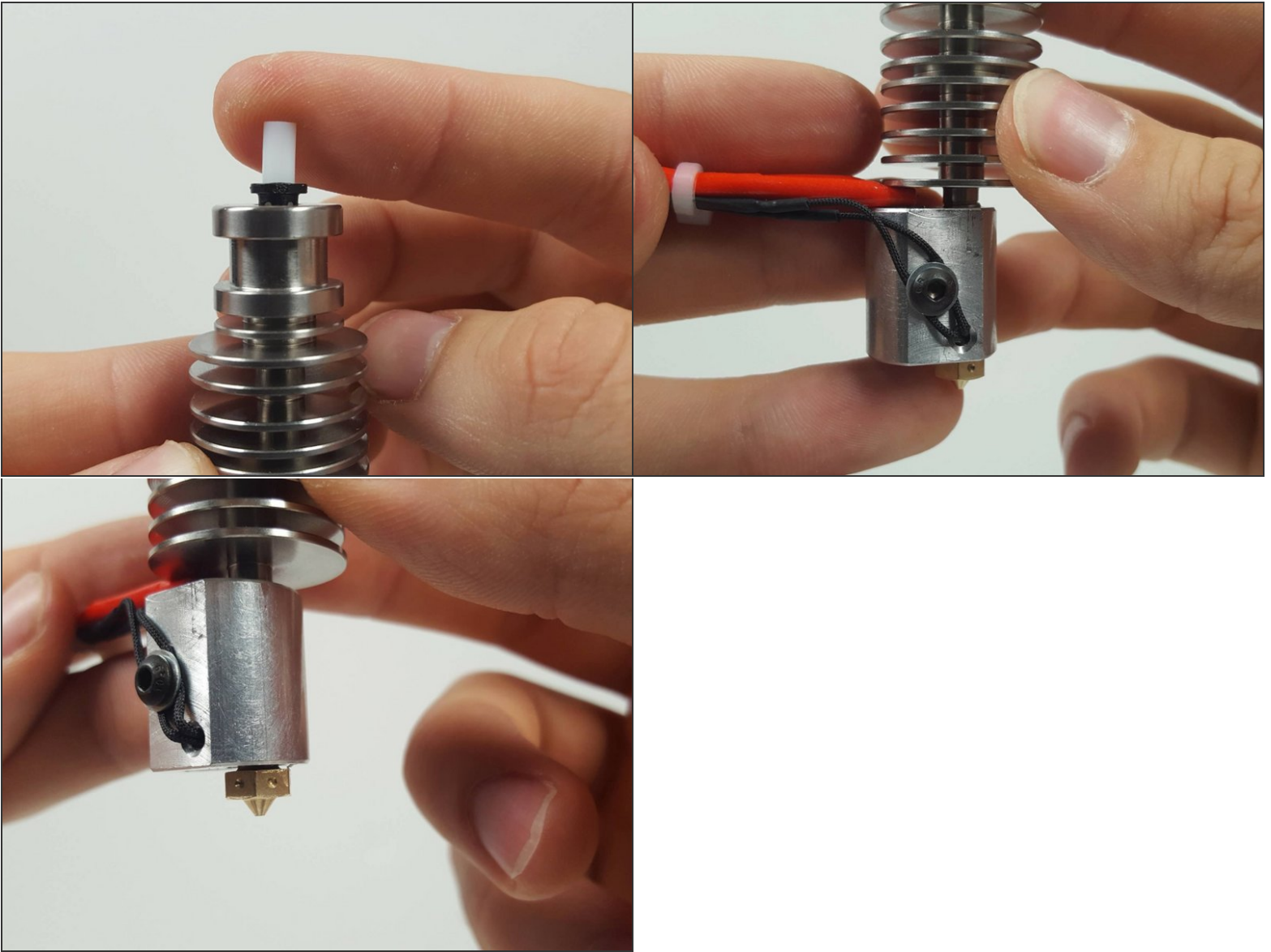
- Screw in the heatsink all the way to touch the nozzle.
- The wires will sit between the heatblock and the heatsink.

Step 21 — Heatsink P.2



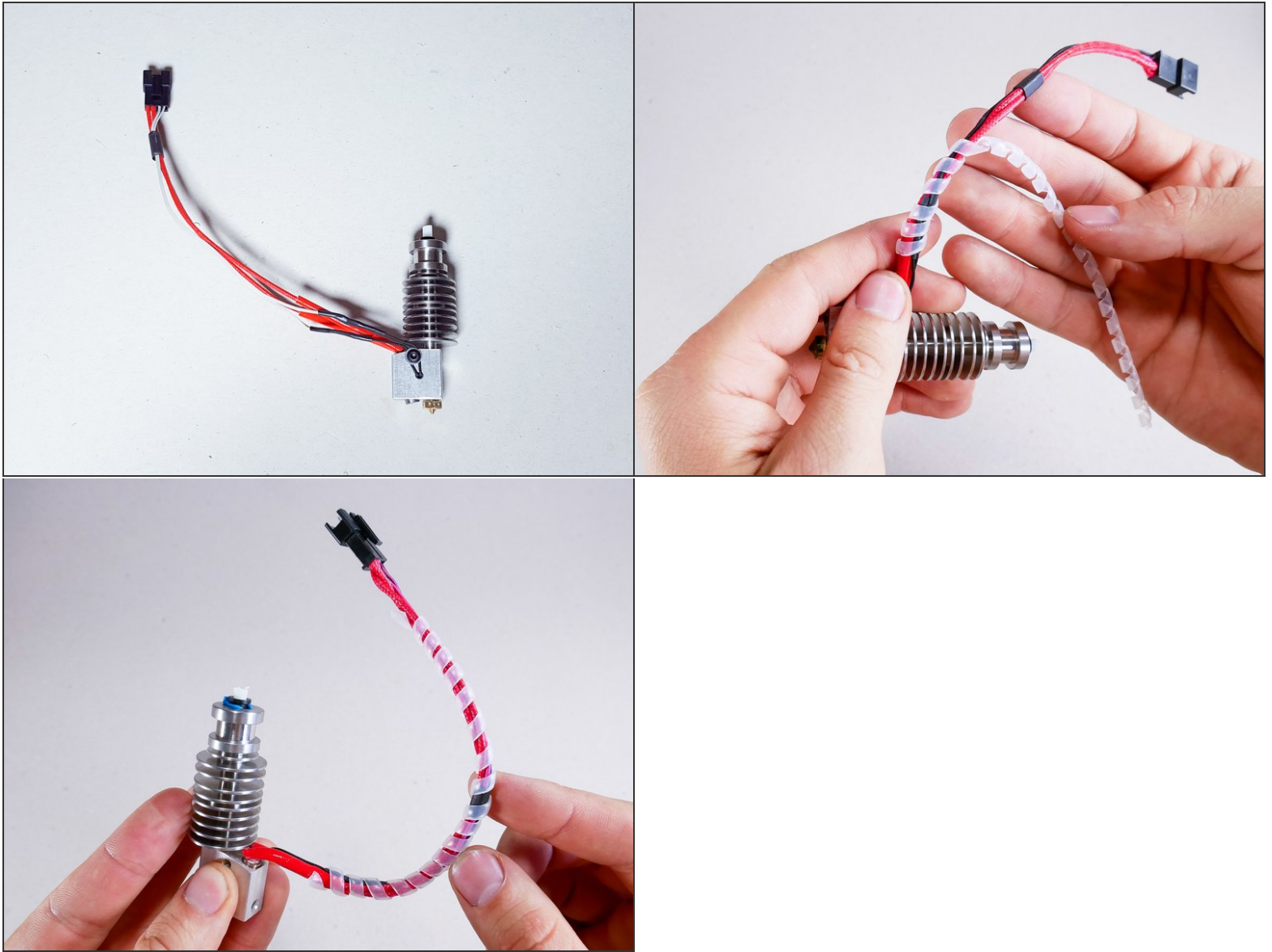
- Shrink the leftover heatshrink at an appropriate place.

Step 22 — CheckPoint: State of the HotEnd



- The PTFE should be sticking out on the top and not moving in any direction.
- The black collet should be all the way up.
- None of the heatshrink should ever touch the heatblock. Only the fiberglass sleeving can withstand printing temperatures.
- There should still be a small gap between the nozzle and the heatblock. The gap can be smaller than the one in the picture, but some gap must be there.

Step 23 — Looking good!



Step 24



Step 25 — You're not done: Hot Tightening !



⚠ Before you can use your hotend, you have to perform a *Hot Tightening* procedure. Hot tightening is essential to sealing the nozzle and heatsink together to ensure that molten plastic cannot leak out of the hotend in use.

- A) If this is the first time you're assembling the hotend, you're done for now! You'll do the hot tightening once you have an otherwise functioning JellyBOX.
- B) If you already have some JellyBOX built, then you may go ahead and follow the [Hot-Tightening Guide](#).

What's Next?

Get back to the [← Makers Kit Build Flow](#) and continue with the next guide.