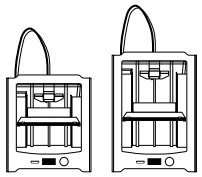
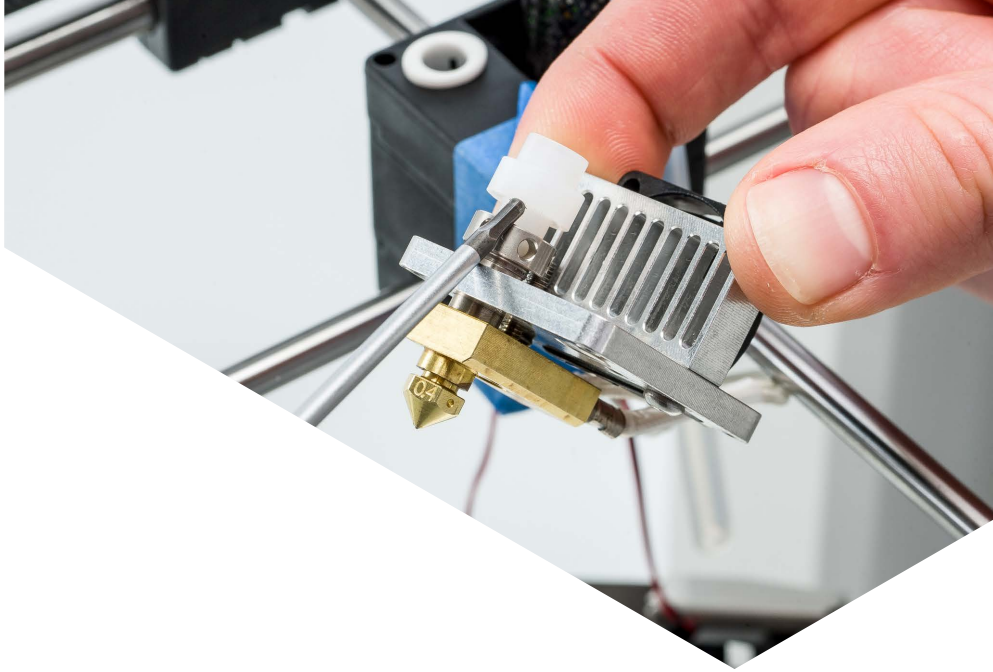


Repair manual

Replacing the TFM coupler



Instructions

The TFM coupler is a key component of the hot end. It allows filament to flow smoothly through it from the Bowden tube and towards the nozzle. The coupler is made from TFM which is able to withstand high temperatures.

However, after extended use, the TFM coupler can degrade due to the heat. When this happens, the bottom part of the coupler can look burnt and the exit hole surface will become rough. This can increase friction on the filament, leading to extrusion problems.

It is recommended to check and replace the TFM coupler when it shows signs of degradation. If experiencing extrusion issues, it is also advised to check the coupler and replace it if necessary. The following steps describe how to correctly replace the TFM coupler.

> **Caution:** Make sure the filament is removed, the Ultimaker is turned off and power supply disconnected before you start the replacement. Ensure the nozzle is cooled to avoid burning yourself.

Equipment/supplies needed

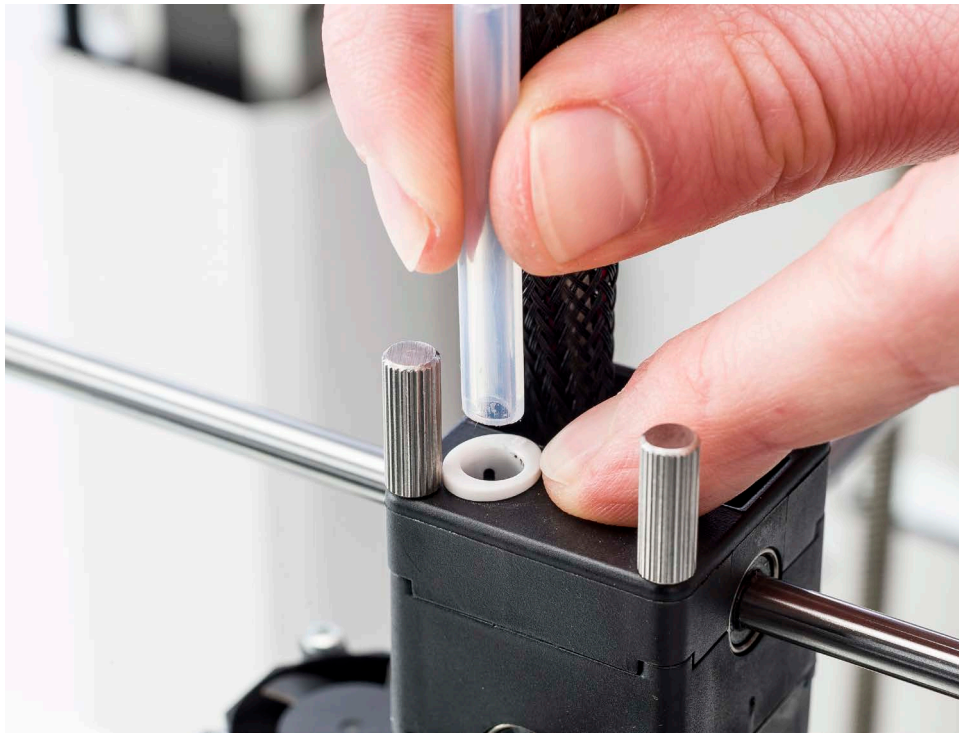
Tools
- 2.0 hex screwdriver
- Blue tape
- Print head alignment aid

Parts
- 1x 2278 - TFM isolator coupler

Time
- 15 minutes

Disassembly

1. **Remove the clamp clip**
- Place the print head in the front-right corner.
- Remove the blue clamp clip.

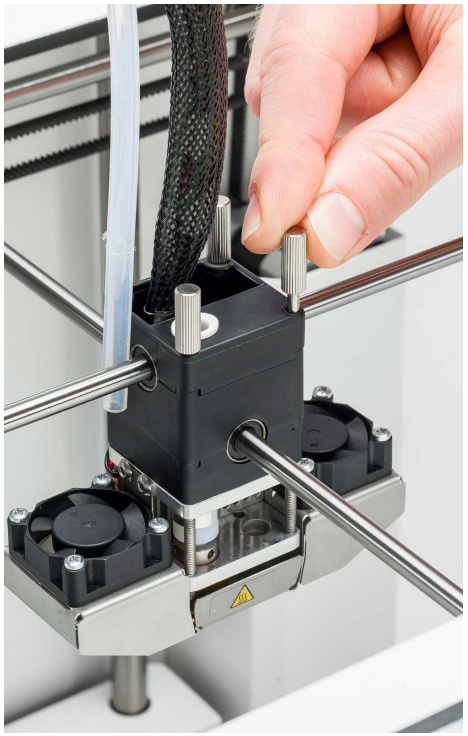


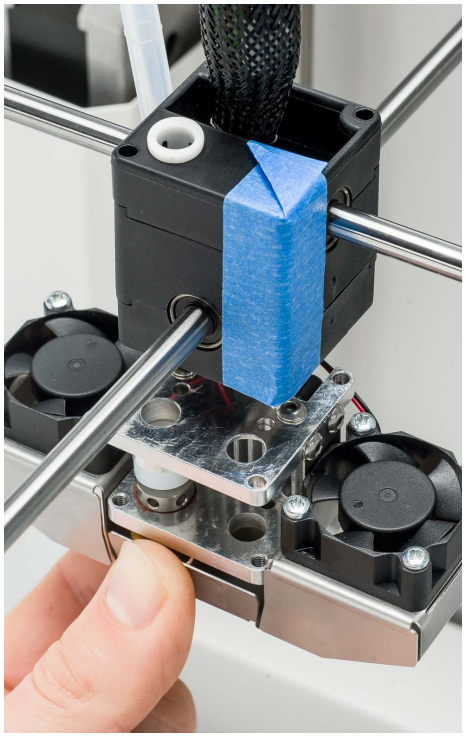
2. **Remove the Bowden tube**
- Press down on the white tube coupling collet.
- At the same time, pull the Bowden tube upwards, out of the print head.

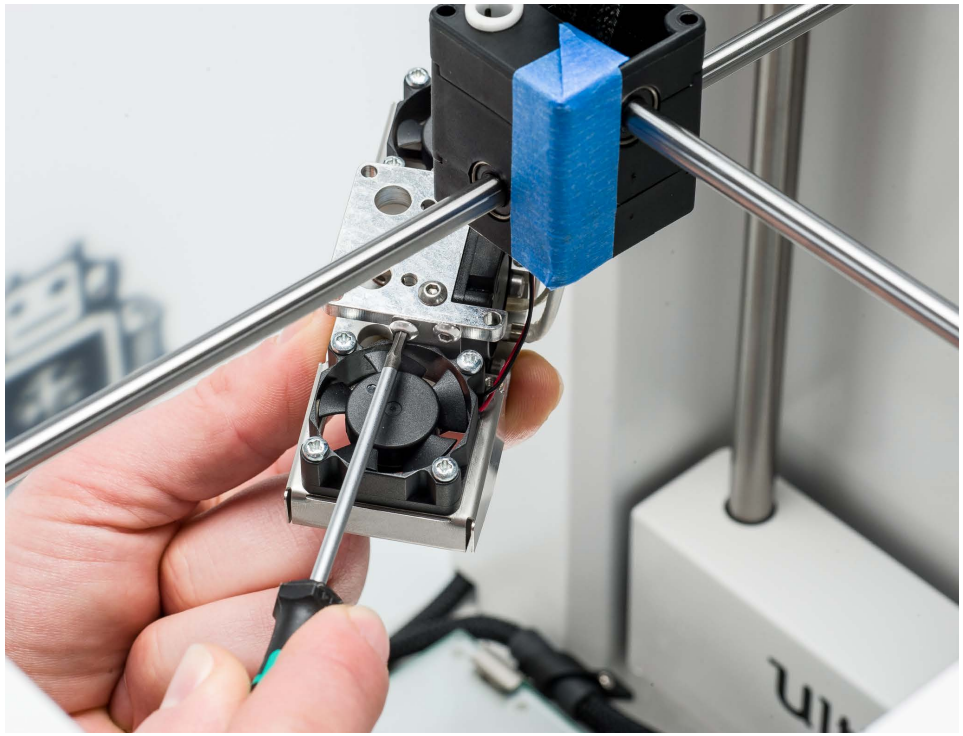
Tip: *It is advised to perform the Atomic Method before proceeding with the next steps. Filament stuck in between the hot end parts can act like glue, making it very difficult to disassemble the parts.*

Full instructions on how to perform the Atomic Method can be found on Ultimaker's Resource pages.

Disassembly







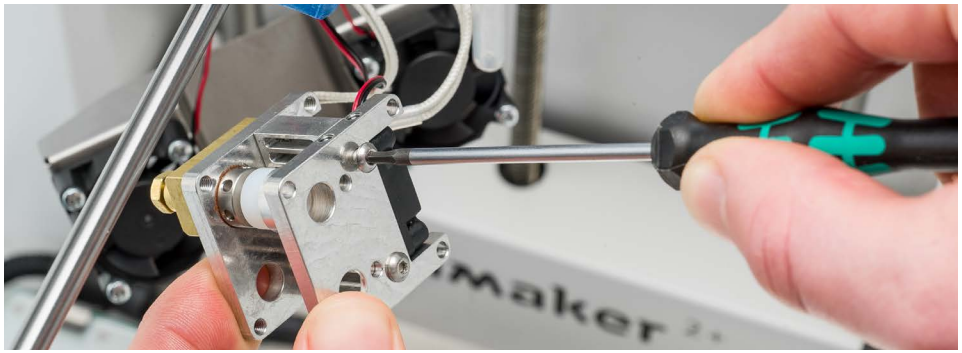
3. Remove the thumb screws

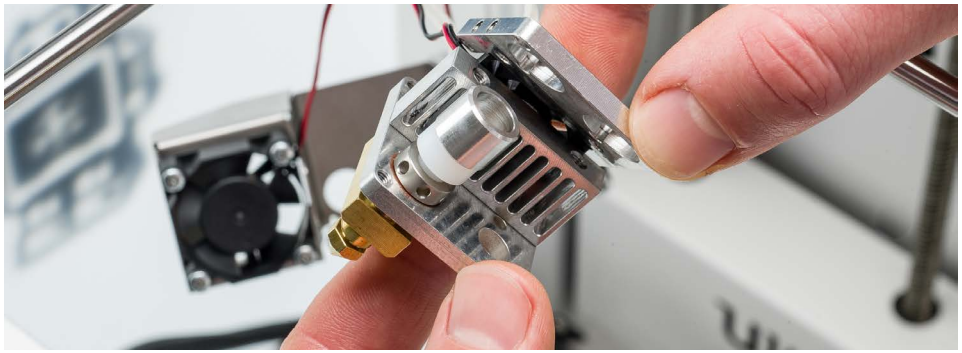
- Now put the print head in the middle of the printer for easier access.
- Loosen the four thumb screws and take them out of the print head.
- Put some blue tape around the three parts of the print head housing. This ensures that the parts stay together.

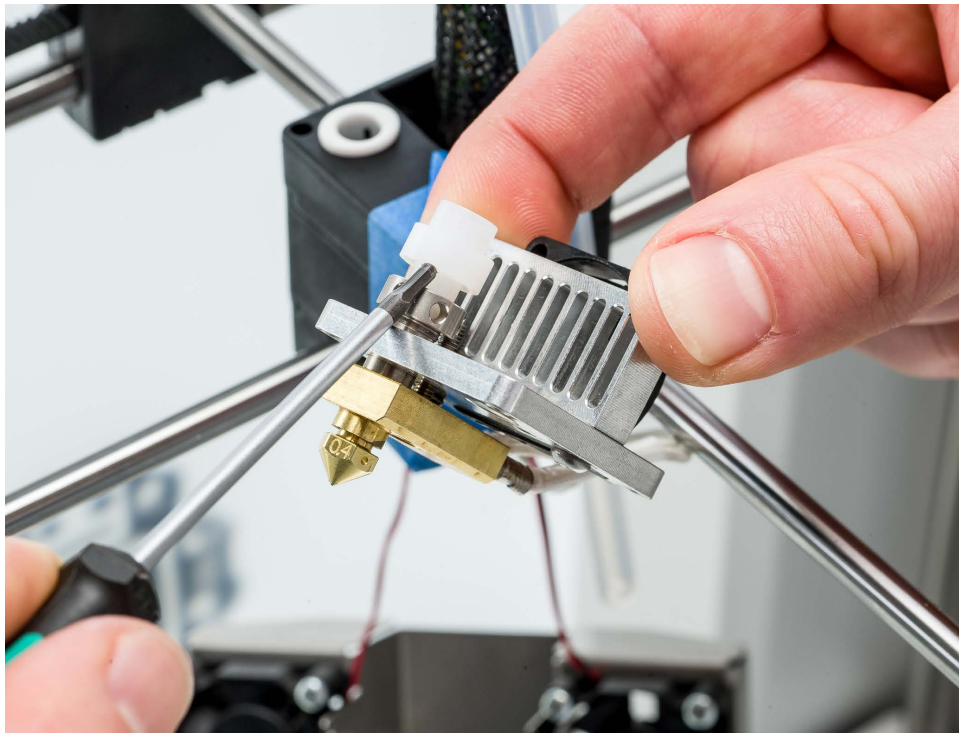
4. Remove the fan bracket

- The fan bracket is attached with two M3x4 bolts on either side of the hot end.
- Use the hex screwdriver to remove all four bolts.

Disassembly





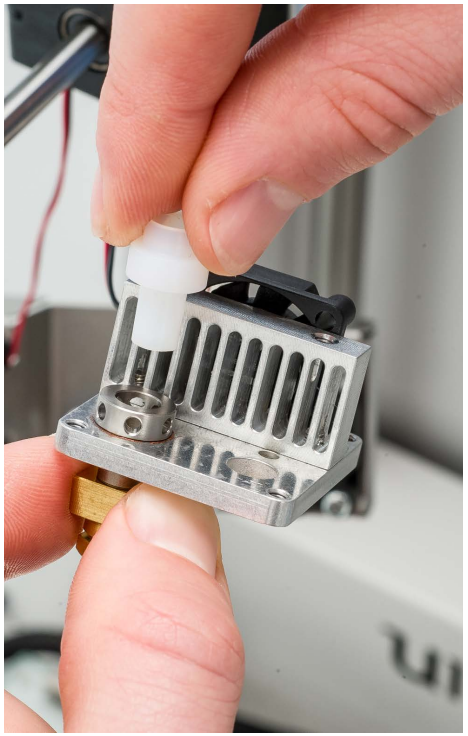


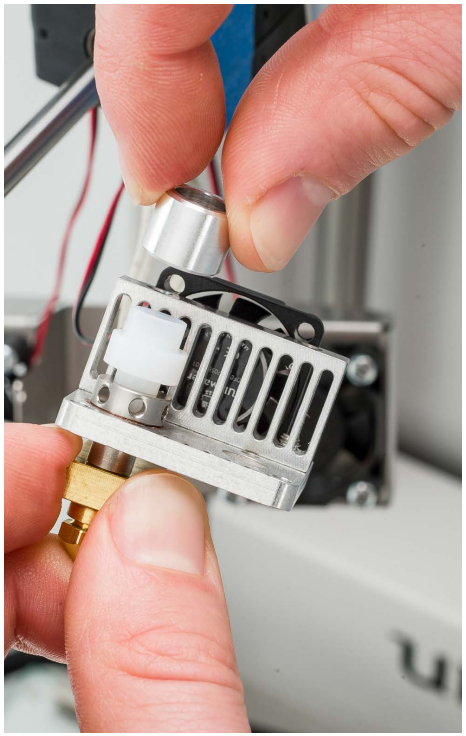
5. Open the hot end holder
- Loosen the two M3x10 bolts that are in the top aluminum plate.
- Remove this plate to access the hot end parts.

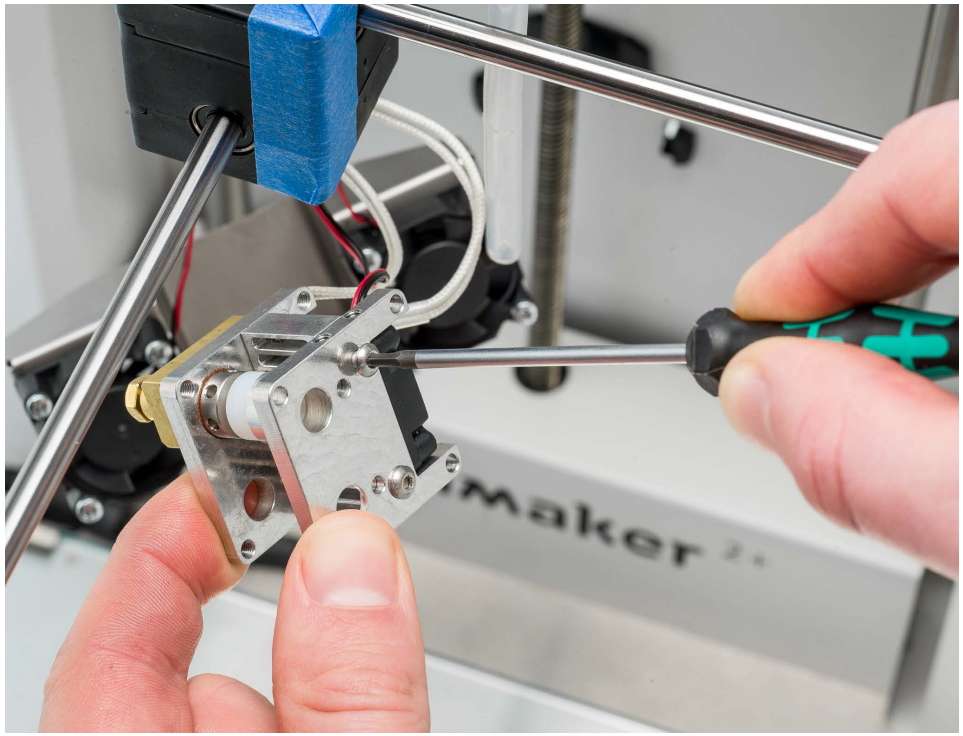
6. Remove the spacer and the TFM coupler
- Take the spacer from the TFM coupler.
- Pull the TFM coupler out of the hot end isolator.

Tip: *The TFM coupler fits tightly in the hot end isolator. If necessary use the hex screwdriver to push it out.*

Reassembly



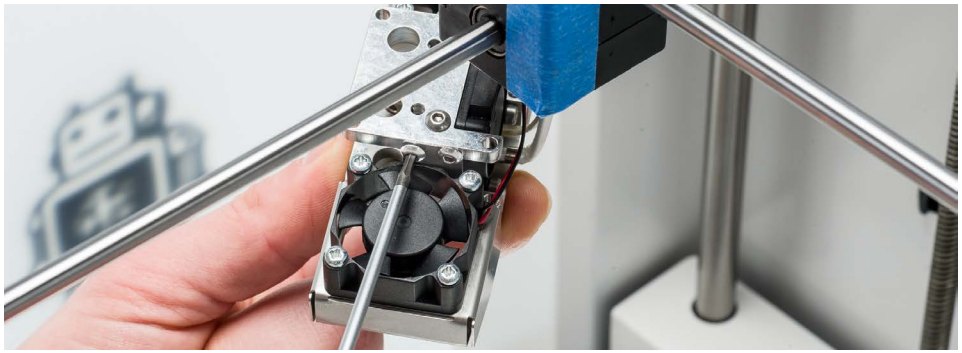


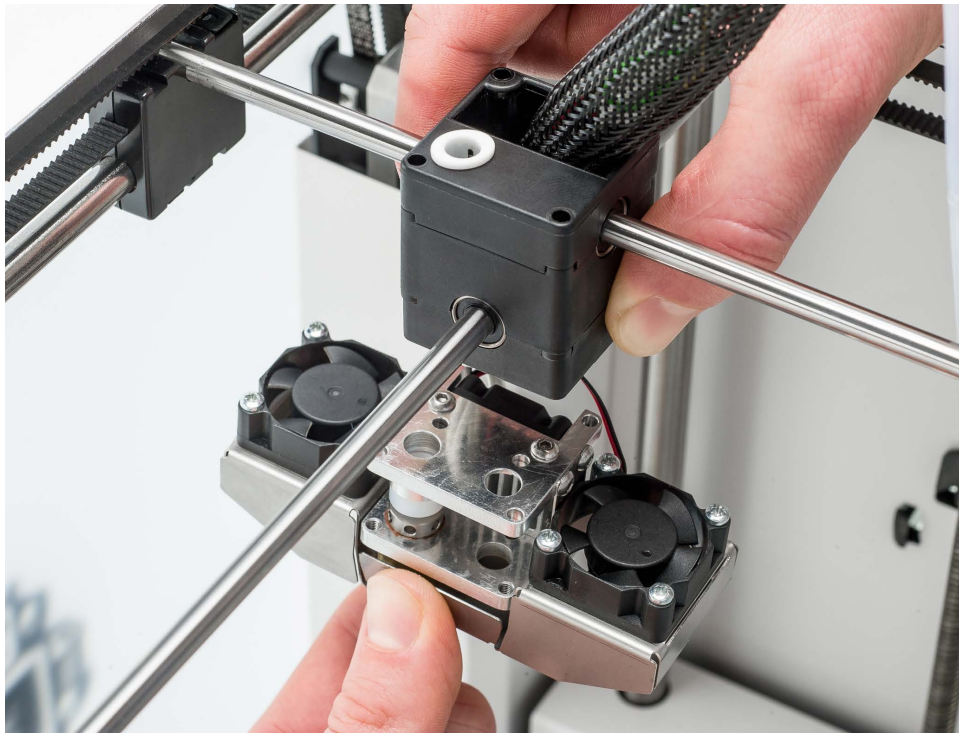


1. **Place the new TFM coupler and spacer**
- Put the new TFM coupler in the hot end isolator. Make sure it is fully inserted.
- Place the spacer on top of the TFM coupler.

2. **Secure the hot end parts**
- Place the hot end holder top on the cooling rib.
- Secure with the two M3x10 bolts.

Reassembly





3. Attach the fan bracket to the hot end

- Align the fan bracket with the hot end.
- Secure the fan bracket to the hot end with the four M3x4 bolts.

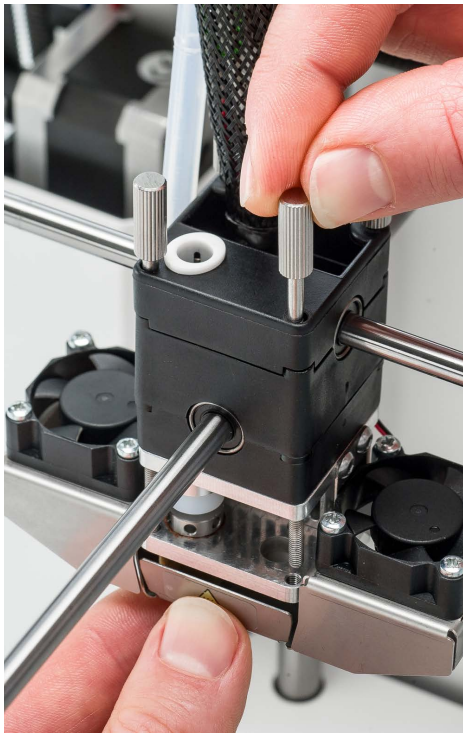
Caution: If the nozzle touches the sides of the hole in the fan bracket, the heat will spread throughout the complete bracket. This will make it harder for the Ultimaker 2+ to maintain its temperature during printing, which can lead to quality issues or error messages.

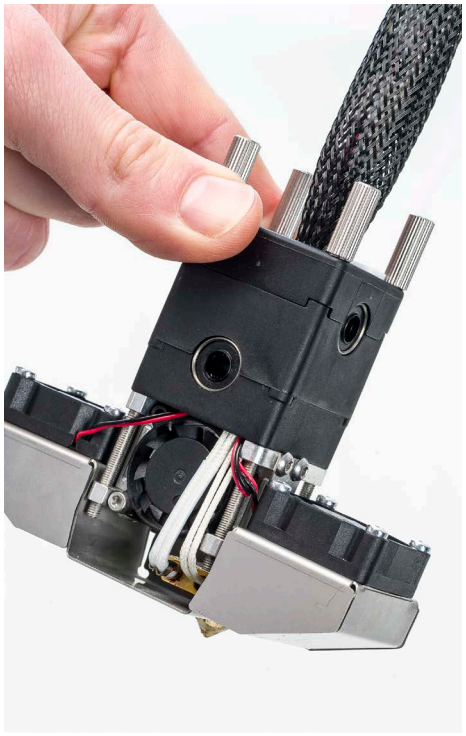
Tip: *To ensure that the nozzle is precisely in the middle of the hole in the fan bracket, first only loosely secure each of the four bolts. Look at the bottom of the print head to align the nozzle, then tighten the four bolts completely.*

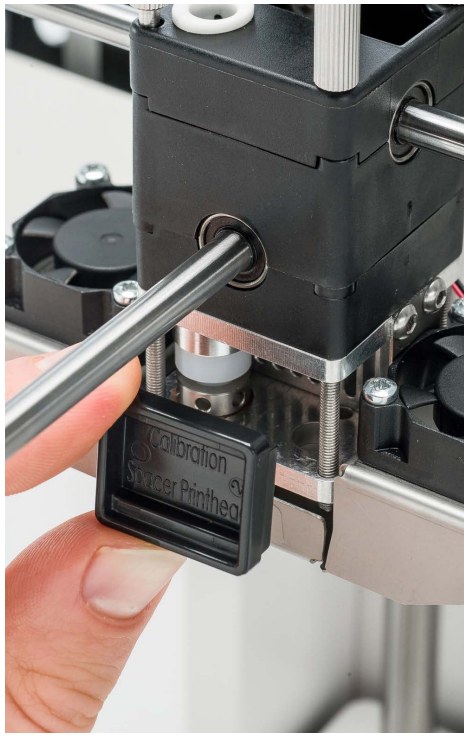
4. Align the print head housing and the hot end

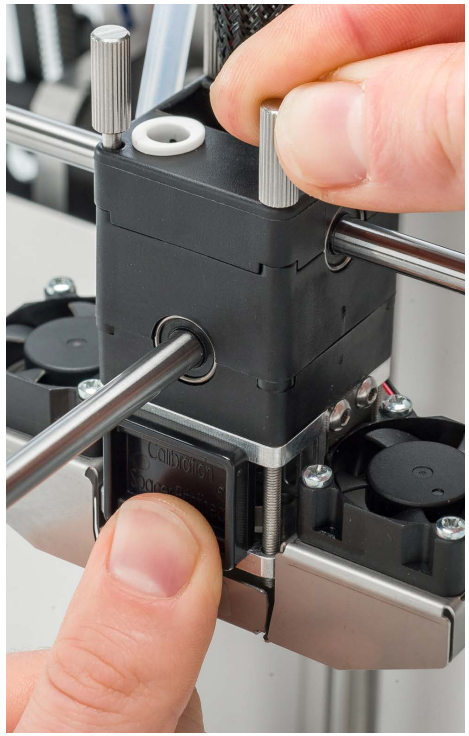
- Remove the tape from the print head housing.
- Move the hot end upwards to align it with the housing parts.

Reassembly









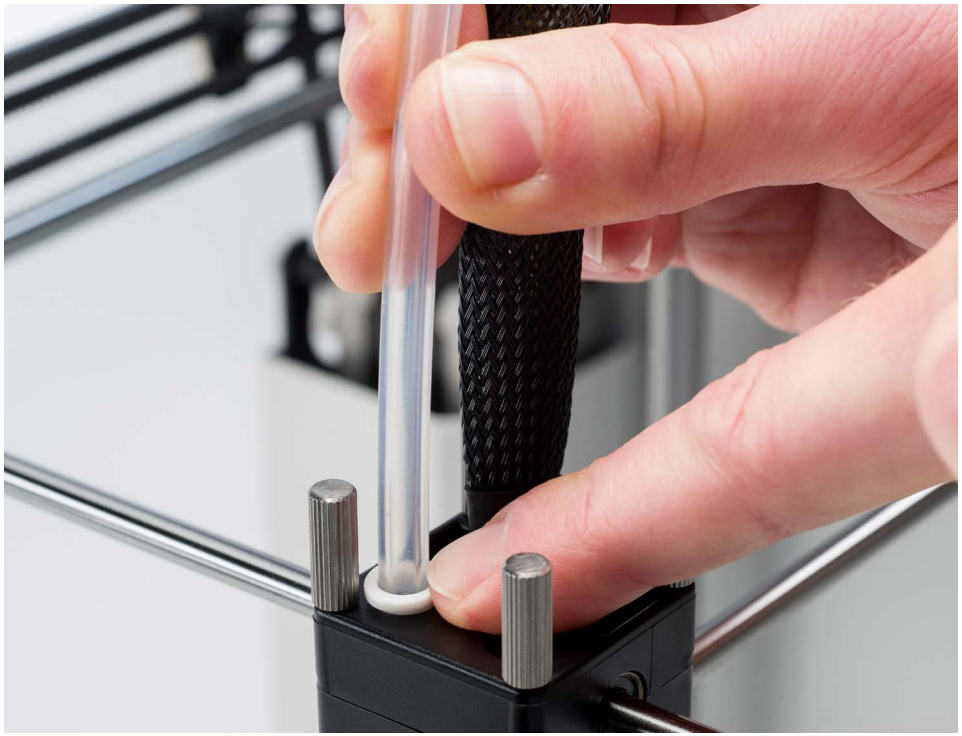
5. **Attach the print head housing to the hot end**
- Insert the four thumb screws.
- Screw them into the bottom aluminum plate, but only very loosely secure them.

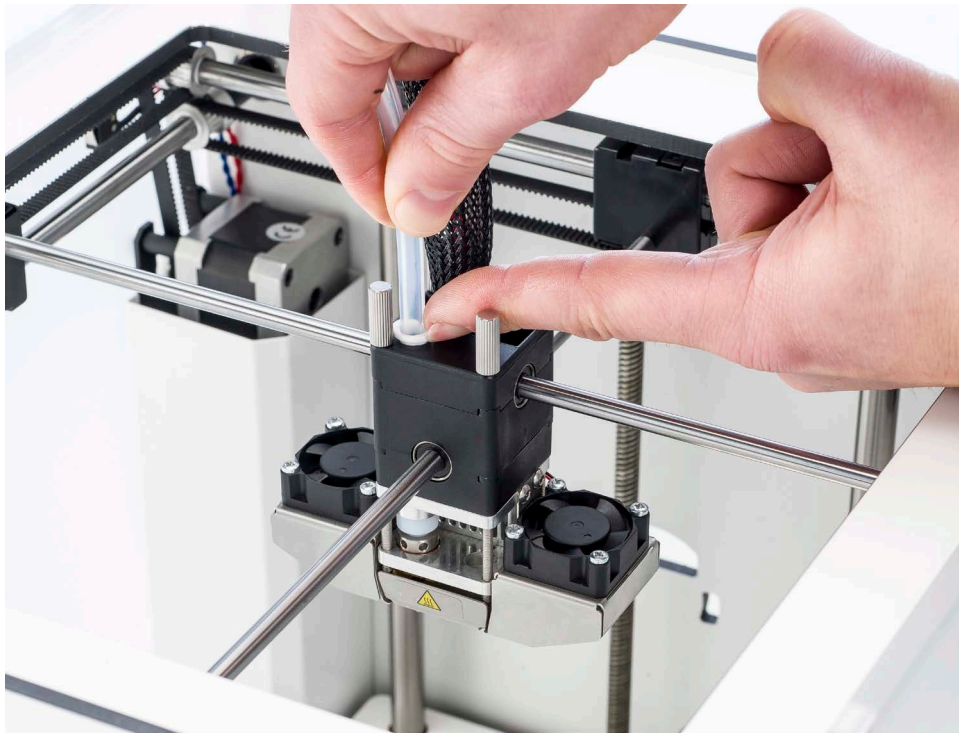
Tip: *Make sure that all cables run neatly side by side and the fan wires are not behind the back two thumb screws.*

6. **Tighten the thumb screws**
- Completely tighten the two thumb screws in the back by hand.
- To tighten the front two thumb screws, use the print head alignment aid. Place the tool in between the aluminum plates of the hot end.
- Tighten the front two thumb screws until the tool fits securely between the plates, but can still easily be removed.

Caution: The print head alignment aid is very important to set the correct pressure on the hot end. Securing the print head too loosely may lead to leakages, while overtightening the thumb screws will decrease the lifespan of the TFM coupler.

Reassembly





7. Insert the Bowden tube

- Press down on the tube coupling collet in the print head.
- Push the Bowden tube all the way in.

8. Ensure the Bowden tube is correctly inserted

- Let go of the tube coupling collet and gently pull the Bowden tube, along with the tube coupling collet, approximately 2 mm upwards.
- Hold the tube coupling collet up with your fingernail.
- While holding the tube coupling collet up, push the Bowden tube down again.

Note: This step ensures that the end of the Bowden tube connects correctly to the TFM coupler. This prevents room between the parts as well as play on the Bowden tube.

Reassembly

9. Secure with the clamp clip

- Place the blue clamp clip around the tube coupling collet to secure the Bowden tube.