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# How to perform a hot and cold pull

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Cleaning filament can be used to clean the print core by applying hot and cold pulls. Hot pulls are used to get the biggest parts of degraded material out of the print core and are necessary when a print core is clogged. With a cold pull, the remaining small particles will be pulled out, ensuring the print core is completely clean.

## Preparation

1. Navigate to the print core cleaning procedure on your printer:
  - a. Go to *Preferences* → *Maintenance* → *Print head* → *Print core cleaning* on Ultimaker S-line printers
  - b. Go to *System* → *Maintenance* → *PrintCore* on the Ultimaker 3
2. Select the print core you want to clean: *print core 1* or *print core 2*
3. Select the material you want to use for cleaning: *Cleaning filament* or *PLA filament*
4. Wait for the printer to heat up the print core and to retract the filament until its end is visible in the Bowden tube
5. Remove the Bowden tube from the print head. First, remove the clamp clip and then push down on the tube coupling collet while pulling the Bowden tube upwards, out of the print head. *Confirm* to continue

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## Hot pull

**Caution:** Use pliers to prevent injuries to your hands in case the material breaks.

**Caution:** Do not use a needle to unclog the CC print core. If the point of needle touches the ruby, this can irreparably damage it.

1. Insert the filament into the print head until you feel some resistance
2. Hold the filament with pliers and gently apply pressure to the material for  $\pm 1$  second so that it extrudes from the print core or until it cannot be pushed any further, and directly pull the filament out with a quick, firm pull
3. Cut off the tip of the filament that you have just pulled out.
4. Check the color and the shape of the tip of the filament and compare it with the image below. The goal is to have a clean tip
5. Repeat this procedure until there is no more degraded material visible on the tip of the cleaning filament. The tip of the filament should look as clean as the example below

6. Once the tip of the filament is clean, manually flush some filament through the print core with pliers and take it out again. *Confirm* to continue



## Cold pull

1. Insert the filament into the print head until you feel some resistance
2. Hold the filament with pliers and gently apply pressure to extrude some material.  
*Confirm* to continue
3. Maintain pressure on the filament with the pliers for the duration of the progress bar
4. Release the filament and wait until the print core has cooled down
5. Grab the filament with pliers and pull it out with a quick, firm pull. *Confirm* to continue
6. Take a look at the tip of the filament and see if it has a clean, cone-shaped tip like the example to the right. *Confirm* to continue







**Tip:** If the tip of the filament is not clean, go back to hot pull or cold pull to repeat the

cleaning steps.

## Reassembly

1. Insert the Bowden tube into the print head and secure with the clamp clip. *Confirm* to continue
2. Wait for the Ultimaker printer to finalize the cleaning procedure



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