Why is my 3D printer leaking filament around the nozzle?

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Abstract. The nozzle is not sealed against the heatbreak. Reseat it, then tighten it hot: E3D says 285 °C and 2 Nm for a brass V6 nozzle, Prusa 280 °C and 2.5 Nm on the MK3S.

Keywords: hotends

Table 1. The number

Hotend	Hot-tighten at	Torque	Gap between nozzle and block
E3D V6, brass nozzle	285 °C, held about a minute	2 Nm	Not given; heatbreak top flush with the block top
E3D V6, plated copper, hardened steel, Nozzle X or ObXidian nozzle	20 °C above your print temperature, held about a minute	2 Nm	Not given
Prusa MK3S, MK3S+, MK2.5S, MK3.5	280 °C	2.5 Nm	About 0.5 mm
Prusa MINI, MINI+	280 °C	No figure: “gently, but firmly”	About 0.5 mm

1 Why is my 3D printer leaking filament around the nozzle?

Plastic leaking around the nozzle means the nozzle is not sealed against the heatbreak inside the heater block: it was tightened cold, or it bottomed out on the block before reaching the heatbreak. Back it off, seat the heatbreak against it, then tighten it hot: 285 °C and 2 Nm for a brass E3D V6 nozzle.

1.1 The number

The figures come from E3D’s V6 Nozzle and V6 HotEnd support pages and from Prusa Research’s nozzle-change articles for the MK3S family and the MINI. E3D’s older V6 assembly wiki gave 3 Nm. Use the current 2 Nm: E3D warns that more force risks shearing the nozzle or the heatbreak.

1.2 Why does filament leak from the top of the nozzle?

The threads do not seal. The seal is the nozzle’s top face pressed against the heatbreak’s bottom face, inside the heater block. E3D warns that a nozzle fastened up against the block too early risks “not creating a seal,” which “will lead to molten plastic leaking from the assembly.” The nozzle hex hits the block first and the two faces never meet. The extruder then pushes plastic through the gap, up the threads and over the top of the block.

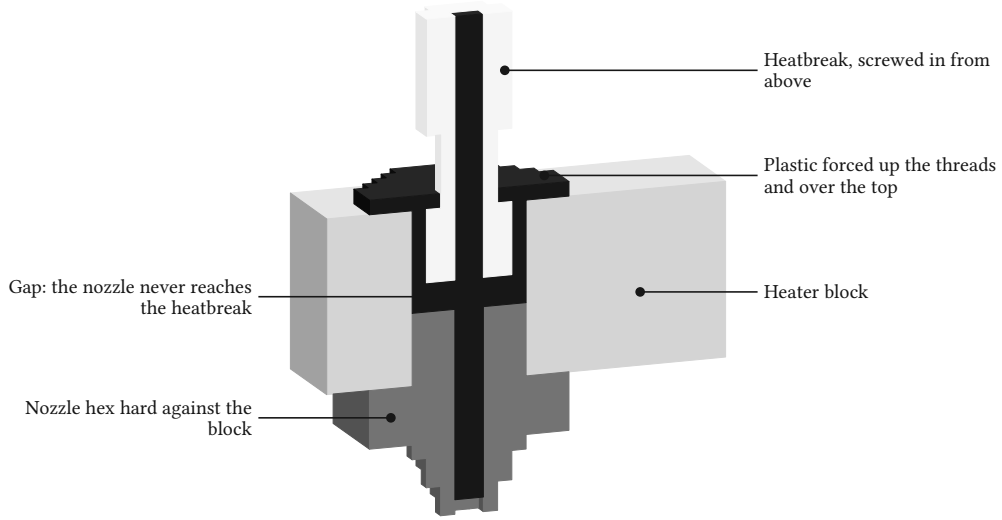


Figure 1. When the nozzle bottoms out on the heater block before it reaches the heatbreak, molten plastic escapes through the gap between them and climbs the threads to the top of the block.

Temperature matters too. E3D's older guide tightens at 285 °C and explains that at lower temperatures the aluminum block contracts and holds the nozzle and heatbreak together. A nozzle tightened cold misses that clamp.

1.3 Why does my 3D printer nozzle keep leaking?

Because the nozzle still does not meet the heatbreak, and more torque will not close that gap. Check these in order:

- **It was tightened cold.** Retighten it hot, at the table's temperature.
- **It bottomed out on the block.** Prusa says no visible gap between nozzle and block can mean "the nozzle didn't reach the heatbreak, which can lead to leaks and clogs." The heatbreak sits too high: reset the joint (step 2 below).
- **The block turned.** E3D and Prusa both hold the block with a spanner while turning the nozzle. A block that rotates shifts along the heatbreak's thread and can break the seal.
- **The liner tube has a gap.** In a hotend lined with a PTFE (polytetrafluoroethylene) tube, Polymaker says the tube must sit flush against the nozzle or heatbreak; a gap leaves a chamber where plastic collects and clogs the nozzle.

1.4 How do you fix a leaking hotend?

1. **Clear the leaked plastic hot.** Prusa's blob method heats about 30 °C above the print temperature: 250 °C after PLA (polylactic acid), 280 °C after PETG (glycol-modified PET) or ABS (acrylonitrile butadiene styrene). Hold it at least 5 minutes, turn the printer off and lift the soft plastic away with pliers. Keep clear of the heater and thermistor leads.
2. **If the nozzle bottomed out, reset the joint.** E3D's older guide screws the nozzle in, backs it off a quarter to half a turn, then screws the heatbreak in until it meets the nozzle. The current guide leaves the heatbreak finger tight and flush with the top of the block.
3. **Hot-tighten.** Heat to the table's figure and wait about a minute. Hold the block with one spanner and tighten the nozzle with a 7 mm spanner. Keep tools off the wires: Prusa warns a spanner can short-circuit the heater, and a very large one can drain enough heat to cause a thermal runaway error.
4. **Check the gap.** Prusa wants about 0.5 mm between nozzle and block. A gap of several millimeters changes the hotend's thermal properties. On a Prusa MINI, redo First Layer Calibration afterward.

If your printer cannot reach the hot-tightening temperature, use your printer maker's own nozzle-change figure. Do not raise the firmware's maximum temperature to reach the figure.

1.5 Is oozing from the nozzle tip a leak?

No. A drip from the tip while the hotend sits hot comes out of the bore, where plastic is meant to leave. Plastic on the block or around the nozzle hex is a leak. Ooze from the tip is a different problem.

1.6 When should you replace the nozzle or heater block?

Replace any part with stripped threads, or a nozzle or heatbreak that sheared from overtightening. If a big leak buried the wires and a MINTEMP or preheat error follows, Prusa says the thermistor or heater cable is already broken. The MINTEMP page covers that check.

Hotends whose nozzle and heatbreak are one part, such as the E3D Revo, have no joint for you to seal. E3D says Revo nozzles change by hand when cold, with no hot tightening.

1.7 How to check it on your own printer

- **Find where the plastic comes out.** Block top, heatbreak or hex means the seal. The tip alone means ooze.
- **Look at the gap.** About 0.5 mm between the hex and the block on Prusa hotends. None means the nozzle bottomed out.
- **Check the heatbreak height.** On an E3D V6, its top sits flush with the top of the block.
- **Check the PTFE tube.** On a lined hotend, push it fully down onto the nozzle or heatbreak.
- **Clean the block.** Prusa lists filament residue on the heater block as a cause of thermal anomalies. It heats the nozzle for 5 minutes, switches heating off, then clears the residue with a small brass brush.

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