Mosquito® Installation Instructions

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Mosquito® Installation Instructions

Mosquito Performance Advantages

Swap nozzles with ease in 10 seconds with the Slice Engineering™ Mosquito all-metal hotend. The patented Mosquito design resists the torque of nozzle changes; no longer must you grasp the hot block with a wrench, risk damaging wires, or pre-heat and risk burning yourself.

Additionally, Mosquito features a heat break of superior performance, with a wall thickness in the heatbreaking zone **less than 20%** that of monolithic all-metal heat breaks. Mosquito's supremely thin-walled heat break minimizes the undesirable flow of heat upward from the melt zone along the filament path. Yet Mosquito[™] is still the most rugged hot end available, because its heat break doesn't serve as a structural element as heat breaks do in all other hotends. The Mosquito heat break features multi-body, bimetallic construction that places a copper alloy (thermal conductivity: 320 W/mK) where heat flow is desired and a stainless-steel alloy (thermal conductivity: 15 W/mK) where it isn't.



Mosquito is rated for operation up to 500°C, meaning it can print all printable thermoplastics, including PEEK, Ultem (PEI), ASA, Nylon, and others.

For a complete list of Mosquito's performance benefits, check out our website.

How to Install a Mosquito on Your Printer:

1. Find an adapter

Mosquito adapters for various printers are being developed by Slice EngineeringTM, other 3D printing companies, and by the enthusiastic 3DP community. Printable adapters can be found on our <u>website</u> or all-metal adapters can be purchased on our <u>webstore</u> or at <u>713Maker.com</u>. Additionally, <u>Bondtech</u> makes extruders specifically designed to integrate with the MosquitoTM hotend.





Figure 2. Groove mount adapter for Mosquito™ from Slice Engineering™



Figure 4. Printable adapter for Mosquito™ on the Prusa Mk3

Figure 3. Threaded Stem adapter for Mosquito™ from Slice Engineering™



Figure 5. Mosquito™ mounted to the Bondtech BMG-M

Mosquito's black aluminum heatsink features a pair of M2.5x0.45 tapped holes and M2.5 counterbored clearance holes for mounting to its top surface (see Fig. 6) and a pair of M2.5x0.45 tapped holes for mounting to its bottom surface. Any of these three pairs of holes may be used to mount Mosquito to your machine. The M2.5 clearance holes may be used with M2.5x0.45 socket head cap screws, or if fastening Mosquito to a plastic component, with <u>special M2.5 thread-forming screws for plastic</u>.

The 4.1mm diameter, 1mm deep counterbore on the top surface of Mosquito's heatsink is designed to locate PTFE tubing with 4 mm outer diameter, aligning the tubing's hole precisely with the heat break's hole. Slice EngineeringTM recommends <u>Capricorn XS</u> tubing since its 1.9 mm inner diameter will prevent dramatically





Figure 7. Boron Nitride Paste

Slice Engineering® recommends Boron Nitride Paste for use in hotends of any brand. For decades it has been used as a "heat transfer and release coating" for industrial cartridge heaters. Please see <u>this article</u> to learn how to properly use Boron Nitride Paste.

3. Install the Temperature Sensor

Mosquito works with all temperature sensor types commonly found in 3d printers:

<u>Cartridge sensors of 3mm diameter such as those from Slice Engineering™</u>:

- 1. Remove either retaining screw (M3 low head socket cap) from the hot block.
- 2. Insert a metal dowel pin (3 mm diameter with a 6 mm length) into the sensor socket

(dowel pins are provided with Slice Engineering temperature sensors). More information can be found <u>here</u>.

- 3. Apply Boron Nitride Paste inside the hot block's sensor socket with the provided applicator swab and onto the surface of the cartridge.
- 4. Insert the sensor into the sensor socket.
- 5. Reinstall the removed retaining screw.
- 6. Wipe away any excess Boron Nitride Paste using a cotton swab, then allow it to

dry as described in the preceding section.

Threaded stud sensors with M3 threads:

- 1. Remove either retaining screw from the hot blo ck.
- 2. Apply Boron Nitride Paste onto the threads and shoulder of the sensor.
- 3. Install the sensor into the threaded hole previously occupied by the retaining screw.
- 4. Wipe away any excess Boron Nitride Paste using a cotton swab, then allow it to dry as described in the preceding section.

Glass bead sensors :

To achieve accurate temperature measu rements with this sensor type, Boron Nitride Paste must fill the space between the glass bead and the wall of the sensor hole. This is achieved by potting the sensor into the hole.

- 1. Fill the sensor socket with Paste and insert the glass bead deeply into the wet paste.
- 2. Anchor the sensor's leads to the Mosquito[™] heatsink using the included Panduit zip tie for cable control and strain relief.
- 3. Wipe away excess Boron Nitride Paste using a cotton swab or sponge and allow it to dry as described in the preceding section .

4. Install the Cartridge Heater

Any cartridge heater that has a 6 mm outer diameter and a cartridge length less than 22.5 mm may be used with Mosquito.



- ① A low-quality cartridge heater may have a substantially oversize (out of specification) outer diameter and not fit Mosquito. If the heater inserts easily, use it, otherwise replace it. Do not force an oversize heater into the cartridge heater slot in the Mosquito.
 - 1. Remove either retaining screw from the hot block.
 - 2. Apply Boron Nitride Paste inside the hot block's heater cartridge socket with the provided applicator swab and onto the surface of the cartridge.
 - 3. Insert the heater into the heater socket.
 - 4. Reinstall the removed retaining screw.
 - 5. Wipe away any excess Boron Nitride Paste using a cotton swab and allow it to dry as described in the preceding section.

5. OPTIONAL: Install the Fan



Figure 9. Mosquito installed on a Prusa printer with the Noctua fan that comes with the Prusa

The Mosquito needs significantly less cooling than a traditional hotend, so just about any cooling fan will provide enough airflow to cool the heat break. When installing the Mosquito as a retrofit the existing cooling fan on the 3D printer is generally acceptable.

If the Mosquito is being installed on a clean build, or brand-new printer the Mosquito fan can be used. We use a tiny, but surprisingly high flow fan on the Mosquito hotend. High flow does generally equal more noise, however Mosquito doesn't actually require much airflow, but it can be useful for high temperature prints in a warm/heated enclosure.



Figure 10. Mosquito™ fan

The fan ships with a pair of M2.5 screws to fasten it to the heat sink of the Mosquito as shown in Figure 11.



Figure 11. Mosquito™ with fan installed

6. Install the Nozzle

If the threads of the nozzle and the hot block are clean of thermoplastic residue, there is no need to "pre-heat" Mosquito to change nozzles. If thermoplastic residue exists, a traditional hot nozzle change is required as it is with other hot ends. With



proper tightening and use of high-quality nozzles, threads will stay clean. Slice Engineering[™] recommends the use of a 1.5 Nm torque wrench for tightening nozzles to prevent plastic leakage.

① Not all nozzles are manufactured to withstand 1.5 Nm of torque. Low-quality nozzles may snap under these loads. Do not use the Nozzle Torque Wrench on lowquality nozzles.

7. Provide Strain Relief and Cable Management

Use the included Panduit [®] zip tie to capture and contain the heater cartridge, temperature sensor, and fan cables as shown in Figures 13-14.



Figure 13. Mosquito™ with temperature sensor, heater cartridge, fan, and nozzle installed with strain relief.



Figure 14. Mosquito™ with temperature sensor, heater cartridge, fan, and nozzle installed with strain relief on the Bondtech BMG-M