What hole size does an M2 heat-set insert need?

Asked 3D Content Team
Published October 10, 2026 · Last verified October 10, 2026

Abstract. Hole diameter, hole depth and minimum wall for M2 and M2.5 heat-set inserts from the Ruthex and CNC Kitchen size tables, plus how much to oversize the hole in CAD.

Keywords: heat-set-inserts, threads-and-fasteners

Table 1. The number

Manufacturer	Insert	Outer diameter	Length	Hole diameter	Blind hole depth, min.	Wall, min.
Ruthex	RX-M2x4	3.6 mm	4.0 mm	3.2 mm	5.0 mm	1.3 mm
CNC Kitchen	M2 x 3	3.6 mm	3.0 mm	3.2 mm	4.0 mm	1.3 mm

1 What hole size does an M2 heat-set insert need?

An M2 heat-set insert needs a 3.2 mm hole. Ruthex and CNC Kitchen both publish 3.2 mm for their 3.6 mm wide M2 brass inserts and call for at least 1.3 mm of plastic around the hole. Make a blind hole at least 1 mm deeper than the insert. Printed holes come out undersized, so draw it slightly larger.

1.1 The number

Figures from the Ruthex and CNC Kitchen size tables, 10 October 2026. Both makers draw the blind hole as the insert length plus at least 1 mm, and both show a through hole as an alternative.

1.2 Why

The hole is 0.4 mm narrower than the insert, so the hot knurls sink into the surrounding plastic. The narrow pilot end at the bottom (3.1 mm on the Ruthex M2) drops into the hole first, which starts the insert straight. The extra depth gives the displaced plastic room below the tip. CNC Kitchen also says to keep the hole straight, not tapered, and normally without a chamfer.

The 3.2 mm is the hole you want after printing, not the CAD (computer-aided design) number. CNC Kitchen's datasheet values are nominal. In its March 2026 test with M3 inserts in PLA (polylactic acid), the printed holes measured about 0.25 mm smaller than designed. Stefan Hermann of CNC Kitchen adds about 0.2 to 0.3 mm to the diameter for smaller inserts. For M2 that means drawing 3.4 to 3.5 mm.

1.3 How to check it on your own print

1. Print a test block with holes drawn at 3.2, 3.4 and 3.5 mm, in the real part's material and orientation.
2. Gauge each hole with the shank of a 3.2 mm drill bit, as CNC Kitchen did. Pick the hole the bit just enters.
3. Set the insert in that hole: it should sit on its pilot end by hand. Install it with the iron 10 to 20 °C above printing temperature, per CNC Kitchen (see iron temperature by material).
4. Look at the back of the hole. A burr of pushed-out plastic means the hole is too small. A sound insert sits flush and holds a screw without turning.

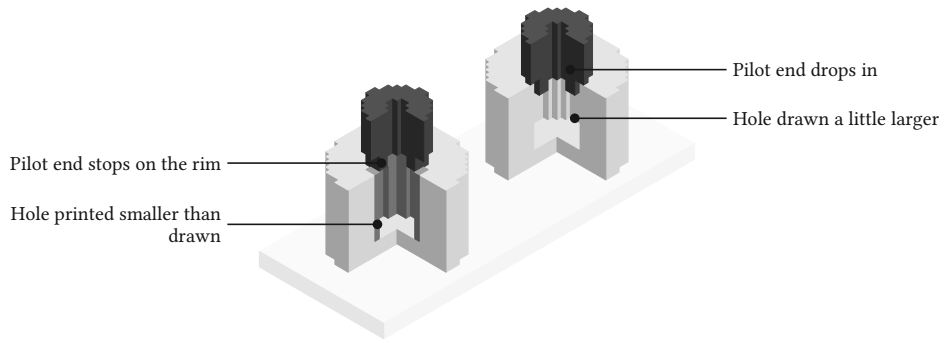


Figure 1. A hole drawn at the datasheet size can print too small for the pilot end, while one drawn a little larger lets the pilot drop in and start the insert straight.

Table 2. The number

Manufacturer	Insert	Outer diameter	Length	Hole diameter	Blind hole depth, min.	Wall, min.
Ruthex	M2.5 (5.7 mm)	4.6 mm	5.7 mm	4.0 mm	6.7 mm	1.6 mm
CNC Kitchen	M2.5 x 4	4.6 mm	4.0 mm	4.0 mm	5.0 mm	1.6 mm

2 What hole size does an M2.5 heat-set insert need?

An M2.5 heat-set insert from Ruthex or CNC Kitchen needs a 4.0 mm hole, the same as their standard M3 inserts, because both share one 4.6 mm outer body. Keep 1.6 mm of wall or more around it, and make a blind hole at least 1 mm deeper than the insert's length.

2.1 The number

Figures from the Ruthex and CNC Kitchen size tables, 10 October 2026.

2.2 Why

Both makers build their M2.5 on the M3 body: the outer diameter, hole and wall rows match their standard M3. So CNC Kitchen's M3 hole test applies unchanged. With holes printing about 0.25 mm small, 4.2 mm in CAD was its sweet spot: the insert could be pre-seated and no burr formed underneath. The M3 hole size answer has the full results.

Not every M2.5 insert uses that body. A generic spec sheet from the distributor Albany County Fasteners lists M2.5 inserts at 4.0 mm wide with a 3.7 mm hole. Measure the outside of your insert with calipers, or read its packet, before you draw the hole. Then run the same three-hole test as for M2, with holes drawn at 4.0, 4.2 and 4.3 mm.

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Cite as: Asked 3D. "What hole size does an M2 heat-set insert need?." October 10, 2026. https://asked3d.com/answers/m2-heat-set-insert-hole-size. Last verified October 10, 2026.