What hole size does an M6 heat-set insert need?

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Abstract. Hole diameter, hole depth and minimum boss wall for M6 (standard and short) and M8 heat-set inserts, from the Ruthex and CNC Kitchen size tables.

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

Table 1. The number

Manufacturer	Insert	Length	Outer diameter	Hole diameter	Blind hole depth	Minimum wall
Ruthex	M6 (RX-M6x12.7)	12.7 mm	8.7 mm	8.0 mm	13.7 mm min	3.3 mm
Ruthex	M6 Short (RX-M6x6.8)	6.8 mm	8.7 mm	8.0 mm	7.8 mm min	3.3 mm
CNC Kitchen	M6 x 12.7	12.7 mm	8.7 mm	8.1 mm	13.7 mm min	3.3 mm
CNC Kitchen	M6 x 6.8 short	6.8 mm	8.7 mm	8.1 mm	7.8 mm min	3.3 mm

1 What hole size does an M6 heat-set insert need?

An M6 heat-set insert needs an 8.0 to 8.1 mm hole. Ruthex specifies 8.0 mm and CNC Kitchen 8.1 mm for their 8.7 mm wide brass M6 inserts, in both the 12.7 mm standard and 6.8 mm short lengths. Make a blind hole at least 1 mm deeper than the insert and leave 3.3 mm of wall.

1.1 The number

Dimensions come from the size tables and drawings on the Ruthex and CNC Kitchen product pages, read 10 October 2026. Both makers set blind-hole depth as insert length plus at least 1 mm, which gives the depth column; CNC Kitchen's short-M6 drawing prints the 7.8 mm figure itself.

Hole plus two walls sets the boss: 8.0 + 2 × 3.3 = 14.6 mm across for Ruthex, 14.7 mm for CNC Kitchen. The short insert needs the same hole and wall as the standard one. Only the depth changes, so it suits thin parts.

1.2 Why

The hole is narrower than the 8.7 mm knurl, so the hot brass melts its way in and the knurl grips the displaced plastic. Ruthex's drawing gives the insert's lead-in end as 7.9 mm, so an 8.0 mm hole lets that end drop in and stand square before heating. CNC Kitchen asks for the same fit: the insert sits easily in the hole, and no burr forms underneath.

The 0.1 mm gap between the two makers is about what printing alone shifts a hole. In CNC Kitchen's tests, a 4.0 mm hole had to be modeled at 4.1 mm to print at size, so measure your printed hole before trusting either number. CNC Kitchen also asks for a straight hole, not tapered, and normally no chamfer. More on depth is in How deep should the hole be for a heat-set insert?.

2 What hole size does an M8 heat-set insert need?

An M8 heat-set insert needs a 9.6 to 9.7 mm hole. Ruthex specifies 9.6 mm for its 10.1 mm wide M8 insert and CNC Kitchen 9.7 mm for its 10.2 mm wide one, both 12.7 mm long. Make the blind hole at least 13.7 mm deep and keep 4.5 mm of wall around the hole.

2.1 The number

Dimensions come from the Ruthex and CNC Kitchen size tables, read 10 October 2026. Neither table lists a short M8. The boss works out to 9.6 + 2 × 4.5 = 18.6 mm across for Ruthex and 18.7 mm for CNC Kitchen.

2.2 Why

The M8 insert is only 1.4 to 1.5 mm wider than the M6, but its minimum wall jumps from 3.3 mm to 4.5 mm. A larger insert displaces more plastic and loads the wall in hoop stress, the ring tension a barrel hoop carries. That stress splits a thin boss along a layer line. The M3 version of this effect is explained in What hole size does an M3 heat-set insert need?.

2.3 Iron tip and temperature for M6 and M8

Large inserts are slow to heat. CNC Kitchen puts it down to thermal mass and advises a thick soldering tip, a slightly higher temperature and as much contact with the brass as possible. Both makers sell tip sets with separate M6 and M8 tips for 900M and T18 irons. CNC Kitchen sizes each tip's centering pin to the insert's bore, so the tip centers itself in the thread.

For temperature, CNC Kitchen's rule is 10 to 20 °C above the material's printing temperature, about 225 °C for PLA (polylactic acid). Ruthex gives 10 to 15 °C above hotend temperature. For M6 and M8, start there and go slightly higher

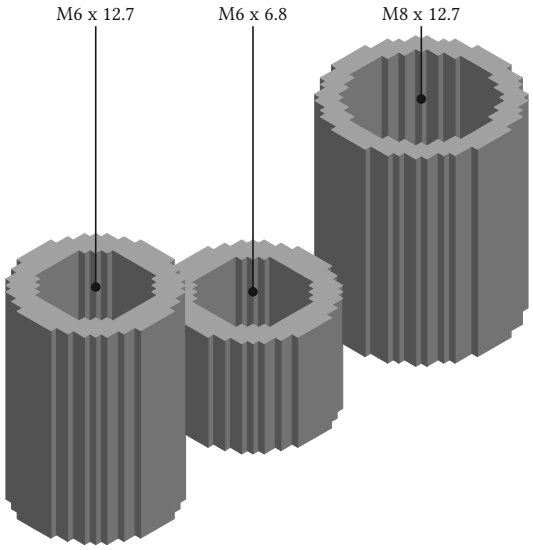


Figure 1. Outer diameter and length to scale from the CNC Kitchen table, with the thread bore cut through each insert. The M8 is the same length as the standard M6 and 1.5 mm wider.

Table 2. The number

Manufacturer	Insert	Length	Outer diameter	Hole diameter	Blind hole depth	Minimum wall
Ruthex	M8 (RX-M8x12.7)	12.7 mm	10.1 mm	9.6 mm	13.7 mm min	4.5 mm
CNC Kitchen	M8 x 12.7	12.7 mm	10.2 mm	9.7 mm	13.7 mm min	4.5 mm

if the insert stalls. The per-material table is in What temperature should the iron be for PLA, PETG and ABS inserts?.

2.4 How to check it on your own print

1. Print a test boss in the real part's material and orientation: 8.0 or 8.1 mm hole for M6, 9.6 or 9.7 mm for M8, insert length plus 1 mm deep, with the minimum wall from the table.
2. Measure the printed hole with calipers. If it is undersized, add the shortfall to the hole in CAD and reprint.
3. Fit the matching M6 or M8 tip, set the iron 10 to 20 °C above printing temperature, and let the insert heat fully before pushing.
4. Melt it in about 90% of the way, then press the rest flush with a flat tool and hold it. CNC Kitchen found inserts creep back out right after melting. To keep it square, see How do you install heat-set inserts straight without a press?.
5. Inspect the boss for a bulge, whitening or a crack along a layer line, and check the back for a burr. Either means the hole was too small or the wall too thin.
6. Thread in a screw and tighten it firmly. The insert should stay flush and not turn.

References

[1] ruthex M6 thread insert RX-M6x12.7 product page and size table. https://www.ruthex.de/en/products/ruthex-gewindeeinsatz-m6-25-stuck-rx-m6x12-7-messing-gewindebuchsen-fur-3d-druck. Accessed October 10, 2026.

[2] ruthex M6 SHORT thread insert RX-M6x6.8 product page and size table. https://www.ruthex.de/en/products/ruthex-m6-gewindeeinsatz-short-25-stuck-rx-m6x6-8-gewindebuchsen-aus-messing-stabile-einpressmutter-fur-kunststoffteile-durch-warme-in-3d-druck-teile-aus-kunststoff-einsetzbar. Accessed October 10, 2026.

[3] ruthex M8 thread insert RX-M8x12.7 product page and size table. https://www.ruthex.de/en/products/ruthex-gewindeeinsatz-m8-20-stuck-rx-m8x12-7-messing-gewindebuchsen. Accessed October 10, 2026.

[4] ruthex Threaded Inserts M6 (25 pieces), M6x12.7, specification table (3DJake). https://www.3djake.com/ruthex/threaded-inserts-m6-25-pieces. Accessed October 10, 2026.

[5] ruthex Threaded Inserts M8 (20 pieces), M8x12.7, specification table (3DJake). https://www.3djake.com/ruthex/threaded-inserts-m8-20-pieces. Accessed October 10, 2026.

[6] ruthex soldering tip set for threaded inserts M2 to M8, product page. https://www.ruthex.de/en/products/ruthex-lotspitzen-einschmelzhilfe-m2-m2-5-m3-m4-m5-m6-m8. Accessed October 10, 2026.

[7] CNC Kitchen Heat Set Insert M6 x 12.7 product page and metric dimensions table. https://cnckitchen.store/products/heat-set-insert-m6-x-12-7-20-pieces. Accessed October 10, 2026.

[8] CNC Kitchen Heat Set Insert M6 x 6.8 short version, product page and dimension drawing. https://cnckitchen.store/products/heat-set-insert-m6-x-6-8-20-pieces. Accessed October 10, 2026.

[9] CNC Kitchen Heat Set Insert M8 x 12.7 product page and metric dimensions table. https://cnckitchen.store/products/heat-set-insert-m8-x-12-7-20-pieces. Accessed October 10, 2026.

[10] CNC Kitchen Installation Tips SET compatible with 900M and T18, product page. https://cnckitchen.store/products/einschmelzhilfen-soldering-tips-m2-m2-5-m3-m4-m5-m6-1-4-m8-100-lead-and-cadmium-free. Accessed October 10, 2026.

[11] Tips & Tricks for Heat-Set Inserts used in 3D printing, CNC Kitchen. https://www.cnckitchen.com/blog/tipps-amp-tricks-fr-gewindeeinstze-im-3d-druck-3awey. Accessed October 10, 2026.
[12] Threaded Inserts for 3D Prints - Cheap VS Expensive, CNC Kitchen. https://www.cnckitchen.com/blog/threaded-inserts-for-3d-prints-cheap-vs-expensive. Accessed October 10, 2026.

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