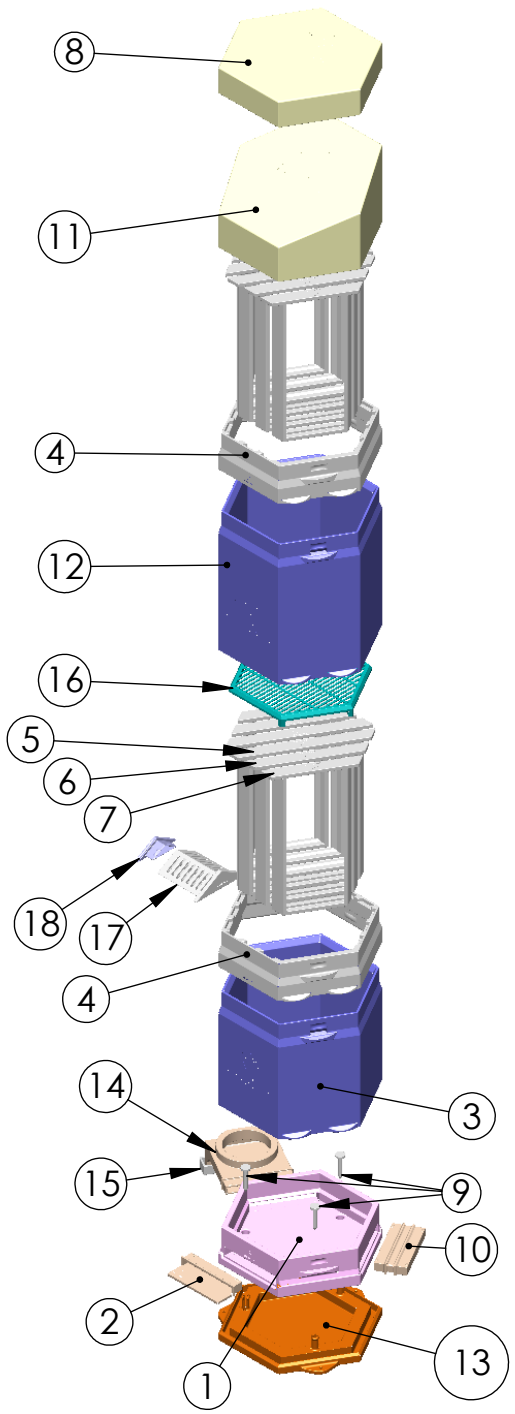
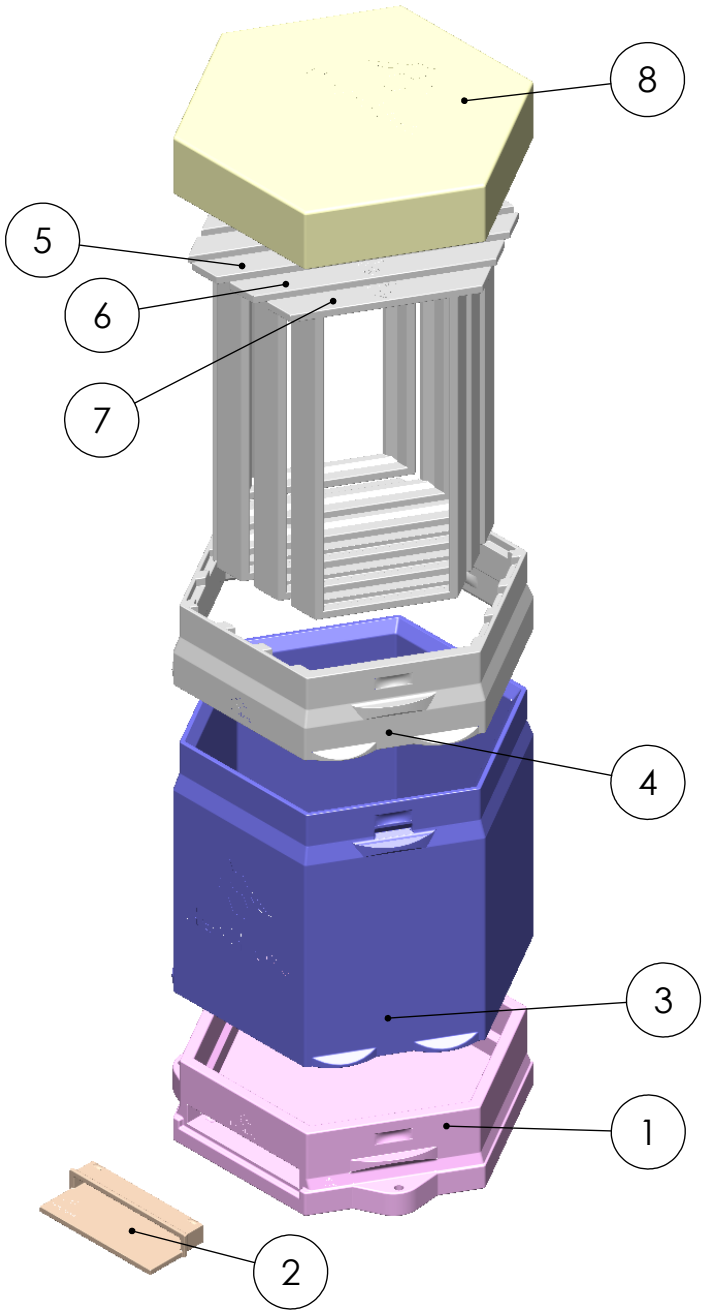


ITEM NO.	DESCRIPTION	PREMIUM BUNDLE/QTY.
1	Entrance 3 Opening_Ant Moat_1 Piece 250mm	1
2	Connector Entrance_250mm	1
3	Hive Body_Entrance_1 Piece 250mm	1
4	Section Frame Parallel_1 Piece 250mm	2
5	Frame_Parallel 1_1 Piece_250mm	4
6	Frame_Parallel 2_1 Piece_250mm	4
7	Frame_Parallel 3_1 Piece_250mm	4
8	Roof_Flat_1 Piece_250mm	1
9	Ant Moat Locking Pin_1 Piece_250mm	3
10	Connector Closed_250mm	1
11	Roof_Bevel_1 Piece 250mm	1
12	Hive Body_Non Entrance_1 Piece 250mm	1
13	Ant Moat_1 Piece_250mm	1
14	Feeder Bottle With Ant Moat_250mm	1
15	Feeder Bottle With Ant Moat_Bottom_250mm	1
16	Queen Excluder_Top_1 Piece_250mm	1
17	Queen Cage	1
18	Queen Cage Lid	1



ITEM NO.	DESCRIPTION	Starter Bundle/QTY.
1	Entrance 1 Opening_1 Piece 250mm	1
2	Connector Entrance_250mm	1
3	Hive Body_Entrance_1 Piece 250mm	1
4	Section Frame Parallel_1 Piece 250mm	1
5	Frame_Parallel 1_1 Piece_250mm	2
6	Frame_Parallel 2_1 Piece_250mm	2
7	Frame_Parallel 3_1 Piece_250mm	2
8	Roof_Flat_1 Piece_250mm	1

The "1 Piece 250mm" ending on a file name designates the file as a one piece part that is sized to print on a 250mm printer bed. Files are designed to create 3/8" bee space. Files can be scaled by 84% enabling them to be printed on a 210mm bed and maintain minimum recommended bee space of 5/16" (.312")(7.93mm). The table below shows information on individual parts.
Parts can be printed without support material with the exception of the Entrance (x) Opening. The opening/s will be supported and need to be removed after printing.
The external hive walls infill should be chosen with a pattern that creates air pockets. The Bambo slicer infill Cubic creates air pockets. This creates thermal insolation, with greater insolation occuring as infil percentage increases. For best insolation, if deamed necessary, infill percentages should be up toward 25%. I have not seen data past this percentace of infil.
Parts have detents that create a firm attachment but can be fairly easily removed by using fingers with a "can opener" action on the ledges provided. They also can be separated by inserting a screwdriver or other tool into the pry area provided.
Print material: We have had great results printing Hex Hives with PETG. It prints well, is UV stable, and food grade. If you want a more environmently friendly option, try Fillamentum Nonoilen filaments. They are fully biodegradable and food-safe. Go to fillamentum.com, use code "HEXHIVES20" to receive 20%off your order, applicable to any item on Fillamentum's website. Using external paint will maximize the hive lifespan.

PART	NOTES
Entrance 1 Opening_Ant Moat_1 Piece 250mm	There is an optional Ant Moat that deters ants from getting into the hive. It attaches through holes in the bottom of the Entance Opening. You have to use the Entance(1,2,or 3) Opening_Ant Moat that comes with holes if you choose to use the ant moat. You also have the option to have 1, 2 or 3 openings for the entrance or accessories, with or without Ant Moat holes. These are printed with support material that will fill the openings and will need to be removed post printing.
Entrance 3 Opening_Ant Moat_1 Piece 250mm	3 Openings with Ant Moat
Entrance 1 Opening_1 Piece 250mm	1 Openings without Ant Moat
Entrance 2 Opening_1 Piece 250mm	2 Openings without Ant Moat
Entrance 3 Opening_1 Piece 250mm	3 Openings without Ant Moat
Entrance 2 Opening_Ant Moat_1 Piece 250mm	2 Openings with Ant Moat
Ant Moat and Ant Moat Locking Pins	The Ant Moat deters ants from entering the hive by creating a moat that can be filled with water. The Ant Moat can be attached and detached by inserting the Ant Moat's three posts through the bottom of the Entance (x) Opening_Ant Moat holes. After the posts are completely snapped into the holes, fully insert the Ant Moat Locking Pins into the Ant Moat posts to secure the connection. To remove the Ant Moat, removal of the Pins will allow the Ant Moat posts to collape enough to pull back through the holes.

PARTS	NOTES
Connector Entrance	The Connector Entrance is a landing pad for the bees. It snaps into an Entrance Opening and can be removed if desired.
Connector Open	The Connector Open snaps into an Entrance Opening and allows connection of additional Entrance Opening parts for expansion of the hive. The connector is open allowing the bees to travel through. They can be removed.
Connector Closed	The Connector Closed is used to close an unused opening on the Entrance Opening. They can be removed.
Feeder Bottle Without Ant Moat	The Feeder Bottle Without Ant Moat attaches to an opening in the Entrance (x) Opening. It fits an upside down Mason jar and lid with very small holes that allows sugar syrup to be fed to the bees if and when needed. Mason jars made for this purpose can be purchased online. This part is to be used with the Entrance Opening without the moat due the less height.
Feeder Bottle With Ant Moat	To be used with the Ant Moat
Feeder Bottle With Ant Moat_Bottom	This is a separate part that attaches to the bottom of the Feeder Bottle with Ant Moat. It is the moat that holds water to deter ants. Snap the moat completely onto the feeder. Once snapped into place, it should not be removed or damage may occur.
Hive Body Entrance	The Hive Body Entrance is attached exclusively to the Entrance Opening. It is shorter than the Hive Body_Non Entrance that is used for hive expansion. If the bodies are interchanged the proper bee space will not be maintained.
Hive Body_Non Entrance	The Hive Body Non_Entrance is used exclusively for expansion of the hive past a single Hive Body Entrance. If the bodies are interchanged the proper bee space will not be maintained.
Section Frame Parallel	The Section Frame Parallel is the part that supports the Frame Parallels. It attaches on top of either Hive Body.

PARTS	NOTES
Roof Bevel and Roof Flat	These are interchangeable and attach to the Section Frame Parallel. Personal choice.
Queen Cage and Queen Cage Lid	The Queen Cage Lid is printed separately and snaps onto the Queen Cage. It is obviously removeable.
Queen Excluder_Top	The Queen Excluder_Top sets between the top of the Frame Parallel's and the Hive Body_Non Entrance. It can only be used with the Roof Bevel due to clearance. It is optionaly used to keep the queen from going to the upper frames but allows the worker bees to pass.
Frame Parallel 1, 2, and 3	Frame Parallel 1, 2, and 3 are three frames of different lengths that fit into the Section Frame Parallel. Two of each frame are used in each Section Frame Parallel. These are used in either Hive Body. Frames are printed without comb foundation. There are two options: the first is to leave the frames empty and let the bees build from the top naturally. They perfer this in my experience. Second option is to buy foundation that is used for Langstroth hives, cut to size and snap into the frames. I use 9" Deep Plastic Foundation Double Waxed from Pierco (Pierco.com) part# 1145, $2.45 per sheet. Sizes of the Frame openings for the foundation are: All three Frames are 9.630" (244.6mm) tall, the width varies by Frame. Width: Frame 1: 6.849" (174mm); Frame 2: 5.482" (139.2mm); Frame 3: 4.115" (104.5mm). Do your best at cutting these as accurate as possible, especially the widths, because there is not much room for error because the areas of the comb is being maximized.
Hive Body_Non Entrance_View Port and Hive Body View Port Glass	This Body has a cut out for a piece of glass or clear plastic window so the bees can be viewed in their natural state. The Hive Body Non_Entrance is used exclusively for expansion of the hive past a single Hive Body Entrance. If the bodies are interchanged the proper bee space will not be maintained. Glass dimensions: 7.200" (182.9mm) x 4.200" (106.7mm). I suggest printing a sample piece of "glass" for a fit check into your printed body window opening, just to make sure of the dimensions before ordering a piece of glass. You can use the Hive Body View Port Glass .STL for this test.