

# Ant Housing

How to build a Formicarium (Ant Nest) and Outworld (Foraging Area). Or good places to buy them.

This guide will also go over hydration, heating, and escape barriers.



It is easy to make your own ant formicarium and outworld.

Formicariums can be built from many different materials such as Firebrick, Grout, Ytong (AAC), gypsum, hydrostone, and others. They offer a high visibility view of your ant colony.

There are step-by-step guides in the back of this booklet, as well as links to the online sources on how to build your own formicarium and outworld.

You can make them so they sit horizontal, vertical or at a slight angle depending on what you prefer. I do believe ants have a greater tendency to muck up the viewing surface of vertical nests, though.

There are some companies that sell formicariums that are designed around long term ant care if you don't wish to build your own.

[www.tarheelants.com](http://www.tarheelants.com)

[www.antscanada.com](http://www.antscanada.com)

There are hobbyists around the world who may sell nests and outworlds.

A quick note about Uncle Milton and Gel farms. They are designed to hold worker ants for 2-6 months. Due to lack of humidity control, problems with collapsing tunnels, sanitation problems, and similar issues a queen and brood (ant young) will not survive for more than a few months. Many of those ant farms are just for observing the workers during their life span, not to hold an actual functioning colony with queen, eggs, larvae, pupae, and workers.

### **How much room?**

If there is too much space, ants may start dumping garbage into the unused, empty chambers. Many people keep upgrading the nest as the colony grows. Many colonies with less than 50 workers only need 3-4 chambers. It is also possible to use sand to fill in the excess rooms to prevent the ants from using them until the colony grows more and empties the tunnels on their own.

### **Moving colonies**

When the colony runs out of space and you need to expand or move them into a new nest. Connect the two nests together and wait, it may take a day or so for them to explore the new nest and think about moving. There are several ways to convince the colony to move if they don't move themselves in a day or so.

Different species react differently to different methods. Typically changes heat, moisture, or light get them motivated into finding a new nesting site. For example, Camponotus (Carpenter ants) are easy to move simply by placing the heating cable on the new nest and cooling the old nest slightly. They will follow the heat.

Some species will follow the heat, or move away from it. Careful not to use too much heat or you could kill your ants.

Stop watering the old nest as it dries out the ants will likely move to the new nest as it has the humidity that they prefer.

If you cover the new nest, some species will move to the cover of darkness.

## Nest Design

Many people love to design their own nest. It is fun to build or carve your design, whether they are tunnels or a completely different design.

Keep in mind certain aspects such as nest hydration, ventilation, and connecting the outworld.

### Hydration:

Ants don't live in bone dry locations. Some ant species prefer more moisture than others as well.

There are several ways to add water to your formicarium.

- If the nest is vertical or under a 45 degree angle, a reservoir molded, or carved into the formicarium would work
- If you use a method that involves pouring, you can make a chamber separate from the others and use a piece of 1/4" tubing to allow water to enter the chamber. Or you can drill a hole in the glass.



### Ventilation:

In smaller nests the tubing leading the outworld provides sufficient ventilation. Some types of nest medium allow small amounts air to pass, such as firebrick and Ytong.

For large nests, an opening with fine stainless steel mesh will be needed. The opening is often on a side of the nest or in the glass. The mesh is epoxied or siliconed on so there is no chance of escape.

## How to connect the Formicarium and Outworld:

Clear vinyl tubing like you see in plumbing is used to connect the formicarium to the outworld. The Formicarium and outworld each have their own piece of tubing that is connected in the middle with a larger piece of tubing.

Usually, a drill is used to drill a hole the same width as the vinyl. The hole is carefully dusted out and lightly moistened with water. Use 2-part epoxy as silicone has too much “give”, and push the tubing as far into the hole as you can. Add another layer of epoxy on the outside around the tubing/nest joint.

Use the same size of vinyl tubing for the outworld and the formicarium. Then you can use a wider piece of vinyl to connect the two. Water and/or heat may help in connecting the ends, although it will probably take scissors to get them apart again.

For example, I use 5/16” x 7/16” on my formicarium and outworld, and I use a 7/16” x 1/2” piece of vinyl as a connector.

You can also buy a plastic connector.



## Tunnel depth

Ants come in many different sizes, so the tunnels they make also vary.

The tunnels should be wide enough for 3 workers side by side and about twice their height. The chambers should be at least twice as long as the queen and as wide as the queen is long. Try not to go over twice the queen’s length for the width of the chambers or the ants may not feel secure. The chambers can be as long as you want. They can be square, rectangular, oval, curved, or any shape.

The chambers should be twice as deep as the queen is tall. Even 3x her height will work as this will allow the ants to pile brood high, sit on top of it, while leaving plenty of space to move around.

## **Heating**

If your house is under 24° C then your colony will need additional heating. Some species need more heat than others. *Myrmica* are heat lovers, while some species of *Lasius* place their brood in moderate heat and excess workers hang out in cooler areas.

The best heating method is to use a heating cable, or a heating pad meant for reptiles. Place it under one corner/side of the formicarium. This will create a heat gradient with heat on one side and cooler locations on the other side. This will allow the ants to choose what temperature they want.

Use a heating cable no hotter than a 15 watt. 11 watt and 15 watt are ideal. You can leave them plugged in all of the time, or place them on a timer to mimic the sun's heat.

You can place the heating cable under the nest, or on the glass.

If the ants are as far as possible from the heat, then it is too warm. Move it further away from the center of the nest and reduce the time it is on.

Heating lamps have been used in the past with success (and some failure). You can try using a ceramic heat emitter or a darkly colored bulb, perhaps the infrared night bulbs for reptiles, to prevent your colony from stressing over the light while providing heat.

Observe your colony carefully for any indications of stress due to overheating.

## **Outworld**

Outworlds are necessary for the ants to keep the nest clean, to allow the ants some area to explore, and to make things easier for you when feeding and cleaning. Some people go all out with their outworlds and decorate them, or even grow plants in them. You can, however, just use a simple, empty plastic box.

Mini food dishes make feeding and cleaning up easier. The inserts inside some pop bottles or aluminum foil work well for dishes for feeding.

Most outworlds have secure lids with ventilation holes, but others are left open. Regardless of which method you choose, you should have a barrier to prevent your ants from escaping.

## **Barriers**

### Olive oil

Extra virgin olive oil is probably the most used. Take some paper towel or a cotton ball, dab it in the oil, and “paint” a light sheen about an inch wide along the top rim of the outworld. Even just using your finger to wipe it on will work. Allow it to settle for a few hours before use since it tends to drip for a while and can drown ants caught in it. If it drips, just wipe up the excess with a clean paper towel. It holds some species with ease, such as *Myrmica* and *Formica*. Although there are some ants who have no trouble walking over it. The oil has to be re-applied every 2-3 weeks.

### Talcum powder

A homemade barrier uses baby powder (those made from talcum powder) and isopropyl (rubbing) alcohol. Mix it together to make a paste, paint an inch-thick band along the top and allow it to dry. Alcohol evaporates quickly so it shouldn't be long until the powder is stuck to the side. The particles of the powder aren't stuck on there very well and even an ant's weight will cause them to fall off. This is temporary, as well, and some ants don't seem to have an issue walking over it. Be careful as the more ants trying to cross it, the faster it deteriorates. If you have a large colony it won't be long before the ants clear a path.

### Fluon or Insect-a-slip

Insect-a-slip, or liquid Teflon, is one of the best barriers out there. It comes in a small bottle and is pretty pricey for the amount you get. Before you let that deter you, though, consider that one layer uses only a fraction of the bottle and lasts at the very least for some months. It does degrade faster with higher humidity or at low temperatures. Each application should last around six months. If you can bring yourself to spend \$20 for a small bottle of the stuff, it is well worth it.

## **How to build formicariums**

Some of the most commonly used mediums are Firebrick, Grout, Ytong (AAC), gypsum, and hydrostone.

### **Firebrick and Ytong**

Both of these are already cast in block form. They will need to be carved.

Firebricks are found in a number of stores. Just ask if they have firelogs and they are usually right beside the firelogs. Firebricks come in one size, 4" x 8".

Firebricks are made from clay, regular cement bricks will not work.

Ytong is hard to get in North America, but can be shipped in.

To make tunnels, you will have to carve the tunnels and chambers in the block. A dremel with a carving bit works wonderfully. A router, drill, or even a chisel and hammer will work. Don't forget to include a water tunnel.

If you dampen the block with water, there is almost no dust.

You will need:

A brick of Firebrick or Ytong.

A way to carve the tunnels (Dremel, chisel, etc)

Drill

Glass to cover the tunnel section (stealing glass from a 4 x 6 picture frame will work)

Silicone

2 part epoxy

Tubing (I like to use 5/16")

1. Take your brick and run it under the tap until it is damp. This will help prevent dust while carving.
2. Use a pencil, or your imagination, to layout a design. Ensure your glass will cover it, and leave 1/2" around the edge untouched by carving.
3. Using a dremel, chisel, or whatever suits you, carve out your tunnels.
4. Using a drill and a bit the same size as your tubing, drill out an entrance for your tubing.
5. Using the 2-part epoxy, glue the tubing into the hole you drilled out. Let it dry.
6. If you wish, you can paint the areas that will touch the glass. Do not paint the tunnels. You can use acrylic paint. (Or you can use a Krylon Fusion plastic spray paint – easiest to use before you wet the brick and carve).
7. Place the glass on the brick. Ensure there is no teeter-totter motion. If there is, it is usually a grain of brick in the way. Once the glass sits firmly on the block, bring out your silicone.
8. Silicone all around the edges of the tunnels in a square formation. Place your glass on the brick and firmly push it into the silicone. Put it glass side down and place a weight on it until it dries.
  - If your water tunnel goes under the glass, place a silicone line between the water tunnel and the nest chambers/tunnels.
9. Once dry, try blowing into the tubing. If air is finding an easy escape you should be able to locate it.
  - If in doubt, smear another layer of silicone along the glass/brick joint.

## Grout, Gypsum, and Hydrostone

You can use either Grout, Gypsum, or Hydrostone as a medium for a nest.

**Note:** Grout needs to be mixed with perlite or another absorbent material in order for it to absorb moisture.

There two methods you can use. You can pour the medium and carve the tunnels out later, or you can make a mold out of clay and pour the medium over top. When you remove the clay you have pre-made tunnels.

You will need:

Grout, or Gypsum, or Hydrostone

A way to carve the tunnels: (Dremel, chisel, etc) OR (clay for a mold)

Drill

Glass to cover the tunnel section (stealing glass from a 4 x 6 picture frame will work)

Silicone

Cooking oil

2 part epoxy

Tubing (I like to use 5/16")

1. Get a container that the glass will fit into.
2. Place the glass in the bottom of the container
  - If you wish to use clay, make your tunnels on the glass
3. Paint a slight sheen of cooking oil inside of the container and on the glass (and clay if applicable).
4. Mix the medium of your choice to a pudding like consistency and pour it in the container
  - If using grout, add perlite at a ratio of 3 grout:1 perlite to allow water absorbancy
5. Let it dry for 24-48 hours. Once it is hard to the touch, remove from container and peel glass out (carefully!). It is harder to remove the glass if you let it dry longer. Put glass back on and place the nest facedown to continue drying.
6. If you chose to pour without clay molds, then carve out your tunnels and chambers.
7. Using a drill and a bit the same size as your tubing, drill out an entrance for your tubing.
8. Using the 2-part epoxy, glue the tubing into the hole you drilled out. Let it dry.
9. If you wish, you can paint the areas that will touch the glass. Do not paint the tunnels.
10. Silicone all around the edges of the tunnels in a square formation. Place your glass on the brick and firmly push it into the silicone. Put it glass side down and place a weight on it until it dries.
  - If your water tunnel goes under the glass, place a silicone line between the water tunnel and the nest chambers/tunnels.



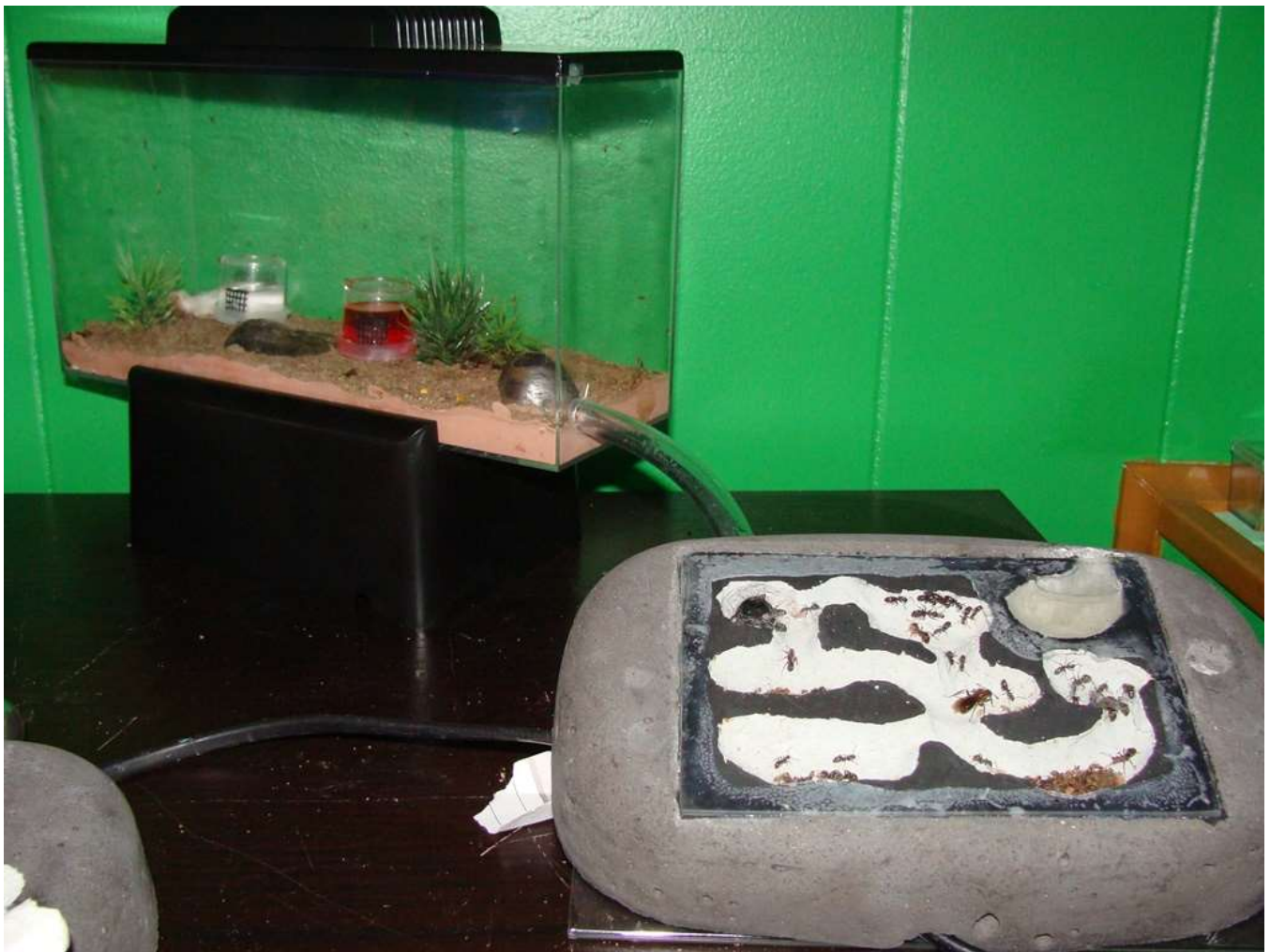
11. Once dry, try blowing into the tubing. If air is finding an easy escape you should be able to locate it.

Links to the builds that contain more pictures:

<http://forum.formiculture.com/index.php/topic/88-photo-journey-of-how-to-build-a-grout-formicarium/>

video: <http://forum.formiculture.com/index.php/topic/88-photo-journey-of-how-to-build-a-grout-formicarium/>

<http://antfarm.yuku.com/topic/17042/Build-an-ytong-nest-for-2-euro#.Urm447TwrYQ>





### Links to online sources

Numerous pictures of Formicariums: <http://antfarm.yuku.com/topic/7701/Formicarium-Pictures-Only-many-big-photographsphotos>

Online guide to ant keeping: <http://antfarm.yuku.com/topic/7701/Formicarium-Pictures-Only-many-big-photographsphotos>