

How to Build a Floating Intake

By Doug Pushard, © 2005-2008, Updated 10/07, 5/08

These project instructions show you how to build a simple, fully functional filter extractor from parts readily available at most common large hardware stores. This extractor is intended to pull water from the middle water of the tank, not to remove particulates from the water.

This project should take less than 1 hour, not including the time required to purchase the parts or install it. The hardest part of this project is the installation in the tank, especially if it has water in it. The extractor is installed at the bottom inside of the tank.

The parts and tools are listed below, but before you start, you need to determine the following:

1. How many filter extractors will you need?
2. What is the size of outlet at the bottom of your tank that you will attach the filter extractor to?
3. What is the depth of your tank(s)?

The first question usually depends on the number of tanks. If you have one tank, you will need one filter extractor. However, if you have more than one tank, you will need one or more, depending on how your tanks are plumbed. If the pump extracts water from only one tank, then only one extractor is required. However, if you are using multiple pumps or if each tank has an outlet directly attached to the pump, then you will need one filter extractor for each tank.

As for question #2, the outlet size is typically 2 inches, but you will need to measure this to be sure. You will also need to know if it takes a male or female PVC screw or non-threaded coupler. A lot of prefabricated tanks take either 4-inch or 2-inch female threaded PVC connectors. Be sure about this or you will end up making numerous runs to the hardware store, like I did. This is part #6 on the parts list below and I have assumed a 2" PVC non-threaded fitting; please check yours before going to the hardware store.

For the depth of the tank (question #3), measure from the top of the tank to the bottom with a tape measure. It does not need to be exact, just close (i.e. round to the nearest foot).

You will now need to go to the hardware store and pick up parts. The Parts List below assumes only one extractor is needed. If multiple are required, multiply the parts required by the number of extractors, except for parts noted with an asterisk, where one should suffice. The tubing should be flexible hose, either potable or non-potable, depending on whether you plan to use the water for drinking. The length of the hose

depends on the answer to question #3, (i.e., it should be just long enough to float on the surface of the water).

Also check the tools list below before you go to the hardware store to make sure you have access to all the required tools.

Parts List

	Part	Quantity	Estimated Price*
1.	Tubing: 5/8" Inside Diameter (ID) and 7/8" Outside Diameter (OD)		~\$1.00 per foot
2.	Hose clamps: 9/16"	2	~\$1.00 each
3.	Toilet Float ball, hollow plastic round ball	1	~\$1.00
4.	Bubbling garden soaker hose ball	1	~\$1.00
5.	Package of fishing line*	1	~\$1.00
6.	2" x 3/4" PVC Reducing Flush Bushing (spig x rfpt) †	1	~\$1.00
7.	3/4" x 1/2" Nylon hose barb	1	~\$2.00
8.	5/8" brass hose barb: 5/8" ID to 1/2" MIB† adapter	1	~\$2.50
9.	1/4" x 2" Eye screw (straight threads)	1	~\$1.50
10.	PVC pipe solvent and glue*	1	~\$6.00
11.	Nylon plumbing tape*	1	~\$2.00
	ESTIMATED TOTAL COST		\$30.00 assuming 10' of hose

* Prices may vary. These are prices at a local Santa Fe Home Depot as of 3/07 †These are standard plumbing abbreviations that your hardware clerk will understand. I've chosen not to burden you with unnecessary minutiae.

If you are using the water for drinking, you will need to be sure the tubing and float ball are food grade¹. I am still looking for sources of the soaker that is rated for food grade. (If you find this somewhere, please let me know and I will refund your purchase of this information product for a link to the location and prices) If you use standard hardware, make sure you have a good filtration system and test your water regularly.

Tools Required:

- Screw driver
- Pliers
- Scissors
- 6" piece of straight wire
- Scotch tape
- Clean rag



¹ For stainless steel floats see vendors on [www.fishbase.org](#) Machine Company in New Jersey.

Step 1: First, connect the eye screw to the toilet float ball.



Connect the 1/4" x 2" eye screw (Part#9) to the bottom of the float ball (Part#3). Hand screw it until it stops or the threads are no longer visible.

Step 2: Connect the 5/8" brass hose barb (Part #8) to the hose (Part #1).



Before inserting the male barb into the hose, put the clamp on the hose. Then insert the male barb into the hose until it is fully inserted. Next, position the hose clamp (Part #2)

on the hose on top of the hose barb. Make sure it is fully on the hose and not half on/half off, which would result in a weak seal. Tighten the screw on the hose clamp with the screw driver. Please make sure to be careful: it is very easy to slip off the screw and puncture the hose, or even your hand. Tighten firmly.

Step 3:



Screw the bubbling garden soaker (Part #4) onto the 5/8" brass hose barb. Hand tighten.

Step 4:



Now, onto the other end of the hose, connect the 3/4" x 1/2" (Part #7) nylon barb to the hose with a hose clamp. Before inserting the 3/4" x 1/2" nylon barb-into the hose, put the clamp on the hose. Then insert the barb onto the hose until it is fully inserted. Next, position the hose clamp on the hose on top of the nylon barb. Make sure it is fully on the hose and not half on/half off, which would result in a weak seal. Tighten the screw on the hose clamp with the screw driver. Please make sure to be careful: it is very easy to slip off the screw and puncture the hose, or even your hand. Tighten firmly.

Step 5: Staying on this end of the hose, connect the PVC adapter (Part #6) to the 3/4" x 1/2" (Part #7) nylon barb.

First, wrap the exposed threads on the nylon barb a few times with the nylon plumbing tape. Make sure it covers all the threads and is smooth (i.e., no wrinkles in the tape which would prevent it from screwing on smoothly).

Screw Part #6, the 2" x 3/4" PVC Reducing Flush Bushing, onto the nylon barb. It should look like the picture below when assembled.



Step 6: Moving to the other end of the hose, connect the garden soaker to the float (Part #3) with the fishing line.

Measure out a length of fishing line. The length should be about 12-16 inches, but could be shorter¹. One end of the fishing line will tie to the garden soaker and the other to the float as shown in the picture below.

To attach the fishing line to the garden soaker, thread it through the holes in the soaker. To do this, tape one end of the fishing line to the 6" wire using scotch tape. Tape must be thin enough to fit through holes in the soaker. I recommend taping the line about 2" from end of wire, wrapping tape diagonally toward the end of the wire. Wrap the tape very tightly as the fishing line should not be easily pulled off the wire. Next, push the wire through a hole in the soaker and continue pushing until it comes out a hole on the opposite side of the soaker.

Now, tie the fish line on both ends. I recommend triple knotting the fish line and pulling it extremely tight. You don't want to find your floater floating on top of the tank and your hose on the bottom of the tank.

It should look like the following:



Step 7: Almost done: now to connect the floating extractor.

This task might require the tank to be empty and for you to be in the tank, if the tank outlet is on the bottom inside of the tank.

First, clean the PVC outlet at the bottom of the tank with a clean rag. Next, connect the filter extractor to the tank fitting either using Nylon plumbing tape (for threaded) or using PVC pipe glue (for non-threaded). If gluing, make sure to clean both connections with PVC pipe cleaner and let it set for the time recommended on the glue can.

All done: congratulations! Now as the tank fills up with water the bobber will float to the surface and the garden soaker will be about 12” below the surface of the water. As the level of the water in the tank increases or decreases the soaker will stay about 12” below the surface, collecting the clean middle water.

Please let me know if you have any problems or questions. If you have a suggestion on another how-to project, email me at doug@HarvestH2o.com.

¹ The fish line should be short enough so the extractor is no more than 12” below surface water. With a shallow tank (i.e. less than 3 feet deep) it may need to be about 6”.