

## ❖ Materials Lists and Suppliers for Micro Systems 2015

Note: This materials list is for the standard installations; if you make any changes from the accompanying drawings, you may need more or less of certain things. Check these figures against your own estimates. The first thing you should do is call Aquatic EcoSystems at 877-347-4788 (on the Web at AquaticEco.com), and get them to send you a free catalog. The catalogs, besides having great prices, lots of choices of equipment, conversion tables and standards, also have "Tech Talks" every other page or so. These are little three and four-paragraph technical lectures that teach you all kinds of useful aquaculture information and skills.

**Important:** This is the materials list for the Micro System 64, the **additional** quantities and items you need for the Micro System 128 are noted like this: "**ADD** 2 sheets more for 128", or "**CHANGE TO** two pieces 6 feet wide by 19 feet long for 128", right after the line for the amount needed for the Micro System 64.

### Materials List for Micro Systems 64 and 128

#### Tank

1- 100 to 150-gallon Rubbermaid or Behlen PLASTIC (NOT that black rubber stuff) stock water tank for the 64, and 200 to 300-gallon Rubbermaid or Behlen plastic stock water tank for the 128. Tank is 5' long by 3' wide by 2-1/2' high. You can also use a polyethylene tank or a fiberglass tank of approximately the same volume. You could use many different things here; what you're trying to do is give your fish enough room to swim and grow, as well as 100 gallons of water minimum. Putting the fish in a 55-gallon drum will crowd them, and their growth will be stunted as a result. Stay away from shallow kid's wading pools as you want 24" minimum depth of water for your fish to feel comfortable, and they puncture **easily!**

#### Trough Materials

- 2 sheets Treated 1/4" ACX plywood. You can use 3/8" or 1/2" here if 1/4" is not available, it's just that 1/4-inch is usually cheapest.  
**ADD** 2 sheets more for 128
- 200 1-1/4" #8 or #10 FH hot-dip galvanized screws (galvanized drywall screws are OK here)  
**ADD** 200 more for 128
- 4 2x4x 8' treated construction grade lumber **ADD** 4 more for 128
- 2 2x4x 10' treated construction grade lumber (for trough ends, cut in half!) **ADD** 2 more for 128
- 8 pcs 1x2x 8' Untreated construction grade lumber, or equivalent in 1-1/2" wide strips of 3/4" untreated plywood **ADD** 6 more for 128
- 2 pieces 20-mil or heavier polyethylene pond liner material, or greenhouse cover material, that is 6 feet wide by 11 feet long . You can get this at places that sell greenhouses, or at places that sell catchment water tanks. **ADD** 2 more pieces for the 128 IF YOU BUILD THE FOUR-TROUGH LAYOUT, and **CHANGE TO** two pieces 6 feet wide by 19 feet long for the 128 IF YOU BUILD THE TWO-TROUGH LAYOUT

**WE USE** Dura-Skrim R20WW by Raven Industries (www.dura-skrim.com, PO Box 5107, Sioux Falls, SD 57117-5107). This is a tough, 20-mil laminated LDPE plastic film that comes in 6-foot-wide rolls.

Your contact for large orders (**over** 500 lineal feet), is Courtney Mendelson, Account Sales Service Representative, Raven Industries - Engineered Films Division, Phone: 800-635-3456, Fax: (605) 331-0333.). **Don't bother her for orders smaller than 500 lineal feet, please! (info next).**

**Purchase smaller orders from: Randy Campbell, 256-679=9488; [rancam@hughes.net](mailto:rancam@hughes.net), AND Global Plastics (<http://www.globalplasticsheeting.com/aquaponics-plastic-film/>), AND from IWT CargoGuard: <http://iwtcargoguard.com/>, 609-971-8810.** You can sometimes get this or an equivalent at places that sell greenhouses, or at places that sell catchment water tanks.

- 4' x 8' x 2" Dow Blue Board Square Edge Styrofoam sheets for rafts (Lowes and Home Depot both stock this) **ADD** 2 more for 128, and add more if you want to experiment with different raft hole spacings
- 1 gallon Benjamin Moore "MoorGlo" Brilliant White exterior latex semi-gloss enamel for painting rafts
- 1 Tube good quality polyurethane or 3M "5200" caulk (NOT SILICONE!!!)

### Aquatic EcoSystems Parts

(From Aquatic EcoSystems 877-347-4788, on the Web at AquaticEco.com)

- 1 MD2 water pump (sometimes you can find this cheaper on Ebay)
- 2 DW9622 air pumps (you can use two 9720 air pumps if they are out of the DW9622) \$150 (sometimes you can also find these cheaper on Ebay) **ADD** 1 more for 128
- 3 103A 5/8" barb to 1/2" MNPT adaptor
- 1 117A 5/8" barb to 1/2" FNPT adaptor
- 1 Foot of TVR80 1/2" reinforced vinyl tubing
- 5 AS8S airstones (includes 1 spare) **ADD** 3 more for 128 (includes 2 spares)
- 1 pack of 10 DB10 airstone bumpers **ADD** 1 more pack for 128
- 40 feet BTP30HD 3/16" ID black vinyl air tubing **ADD**20 more feet for 128
- 4 BK112 1-1/2" bulkhead fitting  
**ADD** 4 more fittings for 128 IF YOU BUILD THE FOUR-TROUGH LAYOUT OF THE 128, **BUT JUST ORDER 4 TOTAL** IF YOU BUILD THE TWO-TROUGH LAYOUT OF THE 128
- 2 Lineal feet of 1/2" plastic mesh (cat # N1020) \$10 for fish tank filter  
US mail postage for all this is about

Total cost for everything to here (including the cost for plumbing which is shown later in this list) is \$852 for Micro System 64, and \$1,275 for the Micro System 128, in Hawaii at Hawaii prices. We have high prices here plus lots of shipping costs, so we think mainland costs could be as much as 30% less than these figures.

You can start and run a system **without** the following items (we do), but you will be **guessing** what's going on with your water and bacteria. **We recommend you get these:**

- 1** 16 Oz inoculating nitrifying bacteria Catalog # 239210
- 1** box of Pentair R44 multi-strips, which contain a nitrite/nitrate test (25 to a box). These are what you use **DURING SYSTEM STARTUP ONLY** to tell you when you're in your nitrite spike, because they show up to 10 ppm nitrites (the Hach test strips noted next only go up to 3 ppm and are not useful during a nitrite spike, but are what you normally use for tests **AFTER** system startup).
- 4** boxes each of Hach H27454 test strips, which come 25 to a box. These test nitrite and nitrate, and are what you use for tests **AFTER** your system startup. Enough for a year of tests at one test every four days or so.
- 4** boxes each of Pentair R443 ammonia test strips, which come 25 to a box. Enough for a year of tests at one test every four days or so
- 1** box Pentair R446 chlorine/chloramine test strips (for testing system water fills and makeup water for too much chlorine before adding to system)

Total to here including plumbing and everything for a 64 is \$969, for a 128 is \$1,392, in Hawaii, in 2014 prices.

### Optional from Aquatic EcoSystems

One- 850048 DO kit digital dissolved oxygen and temperature meter consisting of meter, cable, and probe. About \$395 with shipping. You can test your oxygen levels as often as you want with this meter, and if you are considering a commercial Aquaponics operation, this as well as the pH meters are must-haves, and will help you learn faster now.

One- VitalSine pH meter VS99 (anything cheaper is useless, we tried) about \$155 with shipping. You can test your pH levels as often as you want with this meter.

## **Plumbing parts**

Note: Use Schedule 40 sweep 90's if they are available from your plumbing supplier. If not available, use ells instead. The sweeps will give better air and water flow and will reduce electrical cost for water pumping. If your fish tank is at a different level from your troughs, or a long distance away, you need to refigure your PVC fittings to suit your installation.

### **Schedule 40 2" PVC pipe and fittings**

Male thread adaptor, 2" slip to 1-1/2" male thread	1
2" PVC coupling	1
2" PVC pipe cap	1

### **Schedule 40 1-1/2" PVC pipe and fittings**

Sweeps or Ells 9

**ADD 8** for the 128 **ONLY** IF YOU BUILD THE FOUR-TROUGH LAYOUT OF THE 128

Male Thread adaptors 4

**ADD 4** for the 128 **ONLY** IF YOU BUILD THE FOUR-TROUGH LAYOUT OF THE 128

Pipe 1- 20' length (might even be enough for the 4-trough layout of the MS 128, check your site and how far apart you decide to put your 4 troughs)

Adaptor, 1/2" female thread to 1-1/2" slip	1
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### **Schedule 40 3/4" PVC**

Adaptors, 1/2" Female thread/3/4" male slip	2
Shutoff valve, slip	1
10' feet of 3/4" pipe OR AS NEEDED (read the following):	

The list above contains the standard fittings for an easy installation where all the system pieces are near each other on flat ground. IF your system is unusual in that it has a fish tank higher than the troughs, or around a corner of the house because of space limitations, you need to look at the path the plumbing needs to take, then figure out how many and what kind of pipe fittings and so on it takes to get it there, and how much pipe. Pipe comes in 20-foot, and sometimes 10-foot lengths. You also need PVC glue, the medium or slow kind. Cost for all this is about \$65 in Hawaii.

## **Miscellaneous parts**

- Plywood or boards, screws and paint to build air pump house (it's like a little bird house with one side open to keep the air pumps cool)
- 4 stainless steel 7/8" diameter hose clamps for hose to and from water pump
- 2- 3-1/2" stainless steel hose clamps for fish tank filter
- 3 square feet of window screen or animal screen for fish tank filter
- 3/4" Driscopipe long enough to connect back to your water source from the hose bib at the fish tank. You need a 3/4" male thread bronze hose barb for each end of the Driscopipe with 2 hose clamps each end; AND fittings necessary to connect a hose bib at the fish tank end.

- Conduit, wire, distribution panels, junction boxes, **GFCI breaker or receptacle!!!** and fittings to wire as desired for providing electricity to your pumps and system. Or you can tempt fate and use an extension cord with the ends taped to provide "waterproofness".