

# PhytoTank CL Set-Up Guide: Copepod Culture



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

## **Safety, Care & Maintenance**

### **\*DO NOT SUBMERGE THE PHYTOTANK\***

The LED lighting system is NOT waterproof

Correct use of the disposable culture bags will prevent contamination of your PhytoTank.

If cleaning is needed, then do not wash in water. Instead, wipe the PhytoTank with a damp cloth.

As with all electrical aquarium equipment keep the power supply and power cords away from water. Create a drip loop with your power cord to prevent water from getting into the electronics

#### **PhytoTank Placement:**

Avoid placing the PhytoTank in an enclosed area with limited airflow as this may lead to elevated culture temperatures that may inhibit phytoplankton productivity

For more information visit [www.poseidonreefsystems.com](http://www.poseidonreefsystems.com)  
or email us at [info@poseidonreefsystems.com](mailto:info@poseidonreefsystems.com)

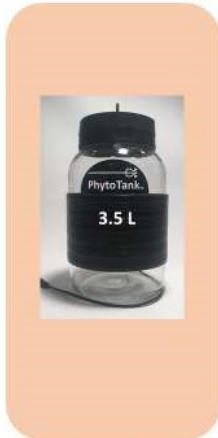


# 1 Poseidon Reef Systems Product Lines

## PhytoTank Systems



## Individual PhytoTanks



## Accessories



## Phytoplankton



# 2 Copepod Systems

## Start with a PhytoTank-CL System



- One PhytoTank for phytoplankton
- Second PhytoTank for Copepods
- Everything you need to harvest pods

## Add On to your order!

### Starter Cultures



### Air Pumps



### Culture Packs



### Add 1-2 Additional PhytoTanks



Grow additional Phytoplankton or Copepod Species Simultaneously

### Additional PodNests



# 3 Phytoplankton Systems

## Start with a PhytoTank System



Grow 1 Phyto Species

## Add On to your order!

### Starter Cultures



### Air Pumps



### Culture Packs



### Add 1-3 Additional PhytoTanks



Grow several Phytoplankton Species Simultaneously

# 4 Phytoplankton Storage

Seal Phytoplankton in storage pouches to backup your cultures



Storage Pouches Sold in 10 Packs



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## Macroalgae Reactor



- Grow macroalgae to lower phosphate in your display tank
- Start with a small clump of macroalgae
  - Pump water from your sump through the reactor
  - Macroalgae will grow and absorb phosphate
  - Periodically remove macroalgae to make room for new growth



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## Buy Now & Expand Your System Later!

### Add PhytoTanks



+



**Power Supply**  
(1 for every 4 PhytoTanks)

+



**2 & 4 Way Power  
Supply Splitters**

### Convert a PhytoTank to a a Copepod Reactor



### Convert a PhytoTank to a Macroalgae Reactor



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## Culture or Dosing

### Culture Caps: Grow Phyto



Aeration &  
Vent  
Bulkheads

### Dosing Caps: Dose Phyto



Aeration, Vent  
& Dosing  
Pump  
Bulkheads

Phytoplankton Systems are sold  
with Culture Caps

- Select a Dosing or Culture Cap When You Add Additional PhytoTanks
- Grow Phytoplankton in one PhytoTank & Dose Phytoplankton from Another PhytoTank

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## Supplies



Fertilizer



Culture Packs:

- 10 Culture Bags
- 10 Aeration Tubes
- 10 Air Vent Tubes
- 10 Disposable Pipettes

Air Filters



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### Self-Sustaining Copepod Cultures

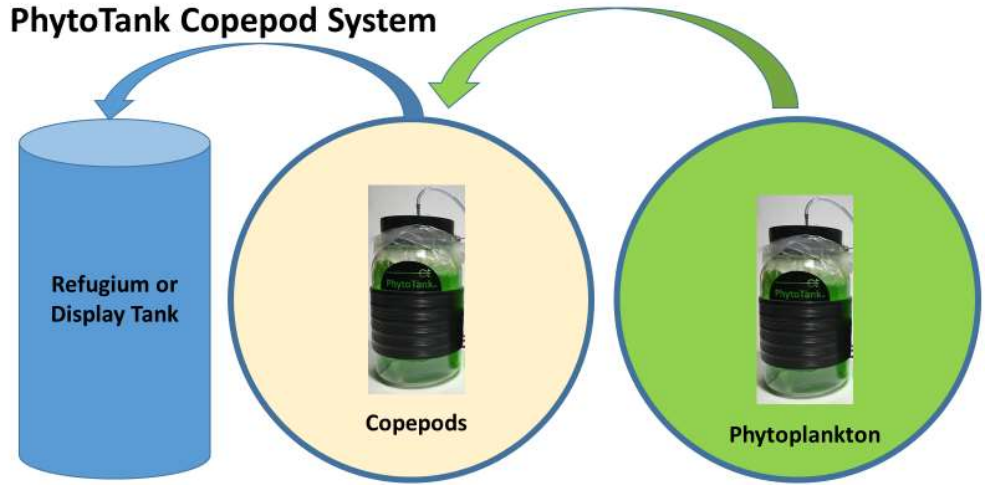
Copepods are an essential food source for a wide variety of reef tank inhabitants, especially mandarin gobies and other dragonettes. In addition, Tisbe pods will consume detritus and contribute to a cleaner reef tank.

PhytoTanks make it fast & easy:  
Grow phytoplankton in one PhytoTank and then feed it to copepods growing in a second PhytoTank.

- No need for fluorescent lights
- No cleaning or disinfecting between cultures
- Spend less time fussing with improvised culture systems and more time enjoying your reef tank!

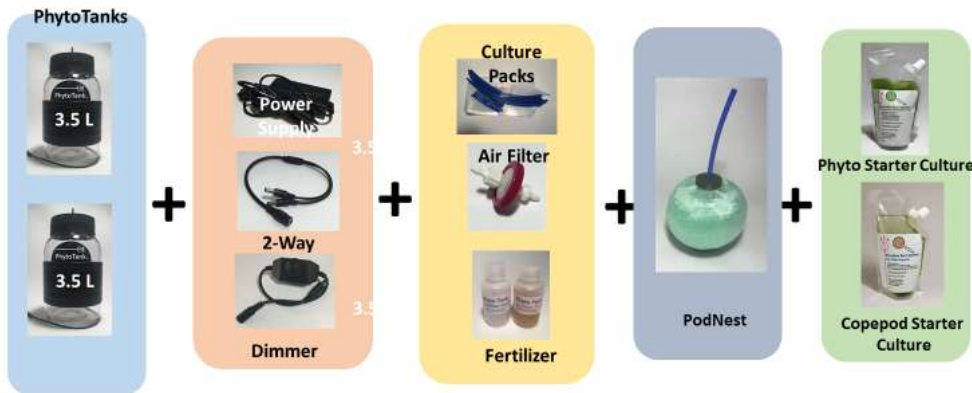
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### PhytoTank Copepod System



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### PhytoTank Copepod System



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### PhytoTank Copepod System: Pod Nest



The Pod Nest is designed to provide a substrate for copepod infestation and simultaneously provide aeration and filtration



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### PhytoTank Copepod System: Copepod Harvesting Sieve



The Copepod Harvesting Sieve is designed to recover copepods from the PhytoTank culture system

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## Phytoplankton Culture Set-Up

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### PhytoTank Culture Set-Up

CL Kit-set up one of the two 3.5 L PhytoTanks for phytoplankton culture

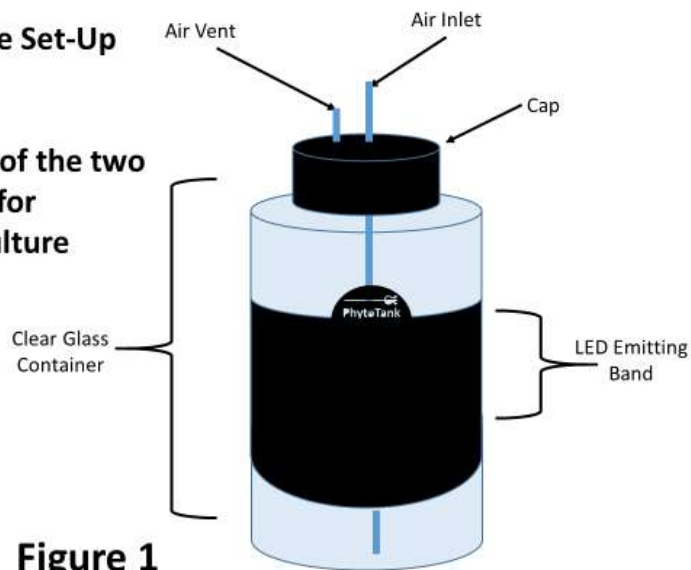


Figure 1

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### Attach Hose Barb to the Cap

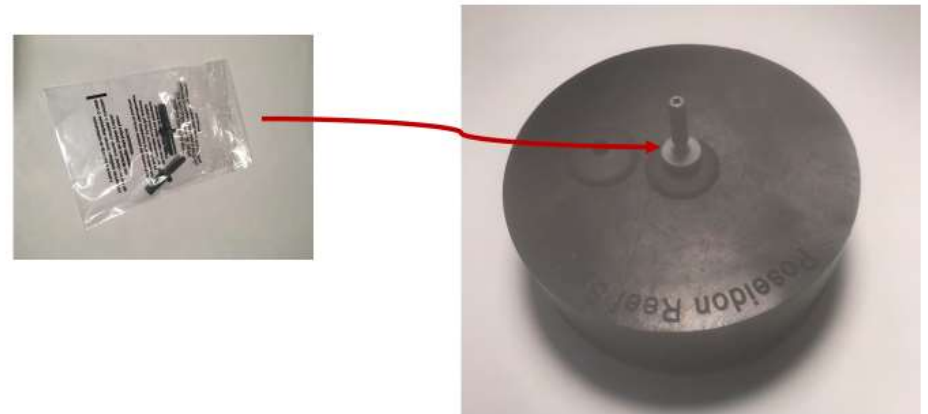
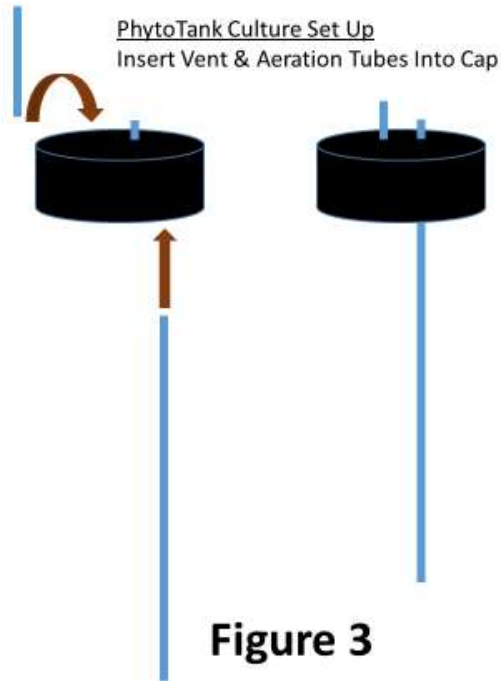


Figure 2

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Figure 4



Firmly insert the tubes into the fittings to ensure adequate air flow

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### PhytoTank Culture Set-Up

Clean your workspace & hands with rubbing alcohol  
clean cap & tubes with rubbing alcohol



Figure 5

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### PhytoTank Culture Set-Up

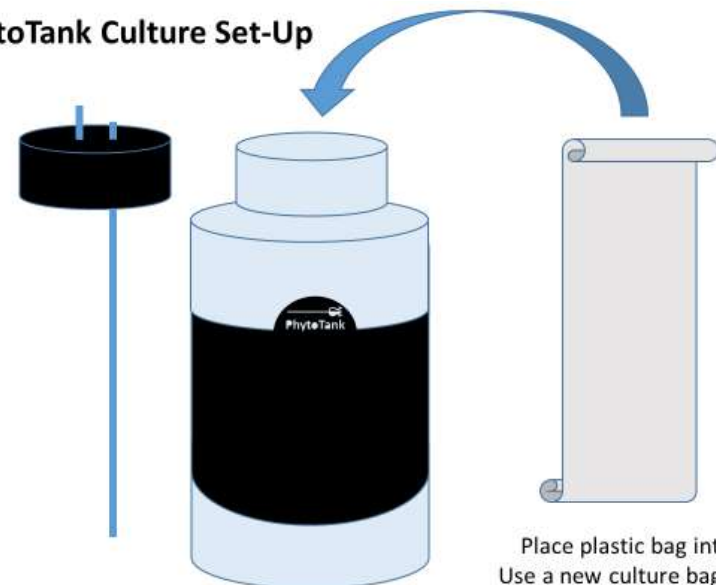


Figure 6

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## PhytoTank Culture Set-Up

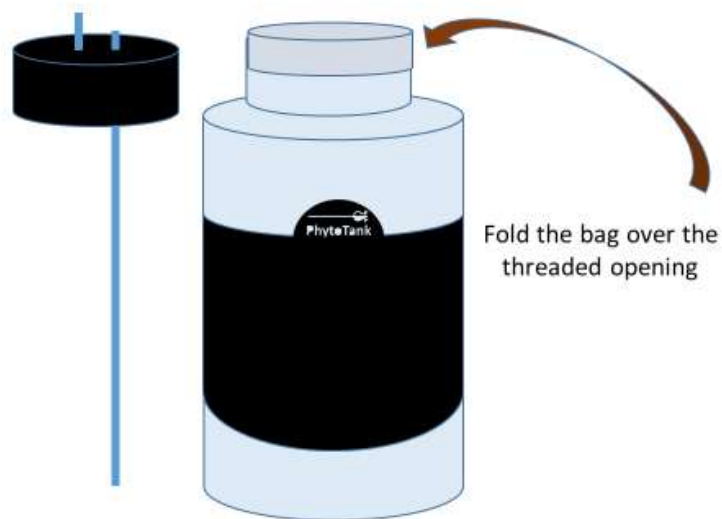


Figure 7

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## PhytoTank Culture Set-Up

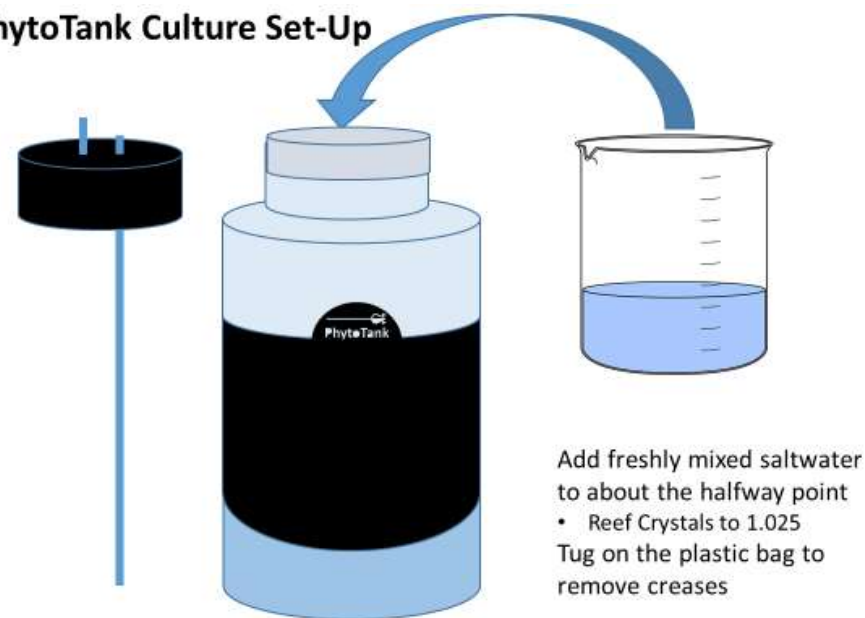


Figure 8

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## PhytoTank Culture Set-Up

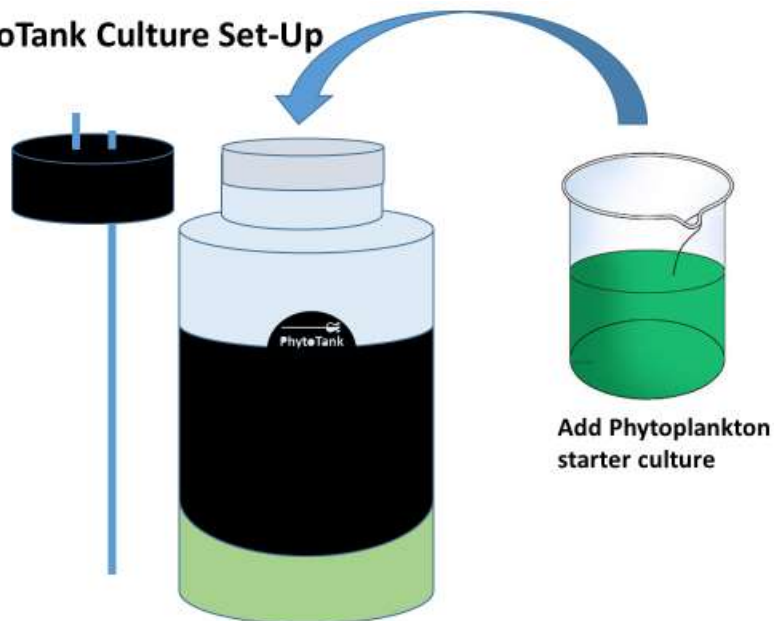


Figure 9

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**Inoculation Levels:**

Use the entire starter culture pouch to start up your system for the first time.

After 7 days restart your cultures. Your results may vary but we recommend a 250 ml Starter Culture.

Starting a new culture with too much phyto will result in the culture reaching a dense plateau phase too soon which may crash the culture. If the inoculation is too small, then the culture may stall or may not reach a satisfactory level after 7 days.



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**Poseidon Reef Systems Starter Culture:**

Our starter cultures are grown in UV-Sterilized, filtered synthetic seawater (salinity 1.025) using silica-free fertilizer. They are packaged at the late exponential growth phase and shipped immediately without any cold storage.

Nano starter cultures can be refrigerated for future use for up to 90 days, but Iso is a lot less stable and may not last more than 30 days. We recommend shaking the cultures weekly to avoid settling which can affect viability. Please note that refrigerated cultures will have a delayed early growth phase. Consequently, allow extra time for these cultures to recover and enter the exponential growth phase.



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**PhytoTank Culture Set-Up**

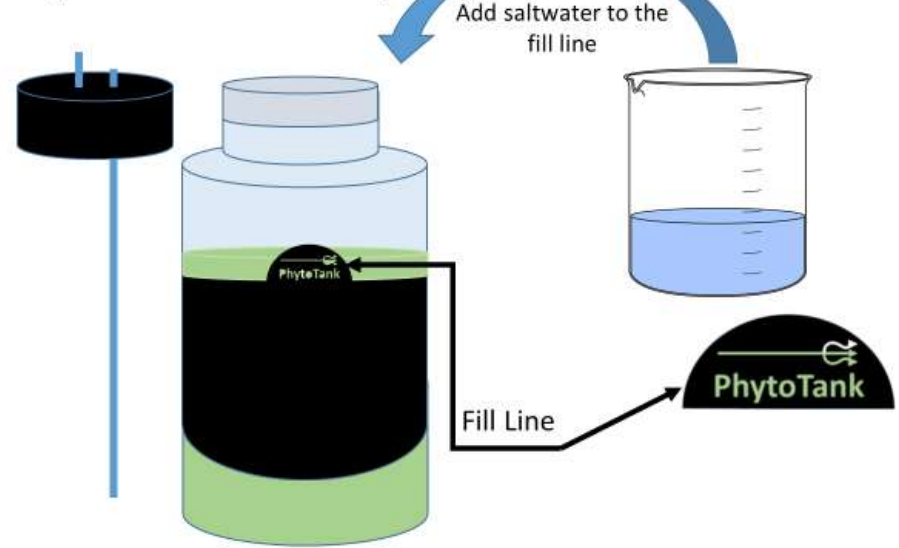


Figure 10

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**PhytoTank Culture Set-Up**

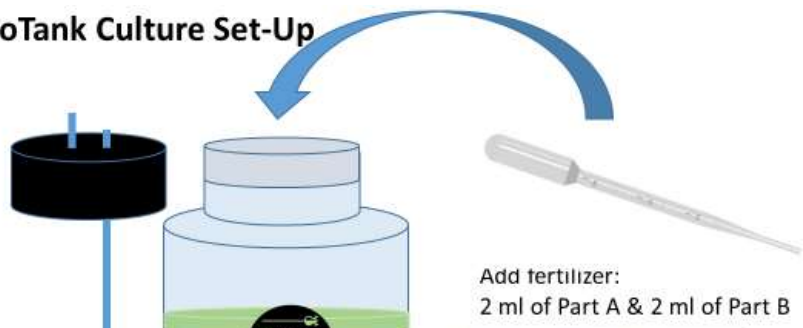


Figure 11

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**PhytoTank Culture Set-Up**

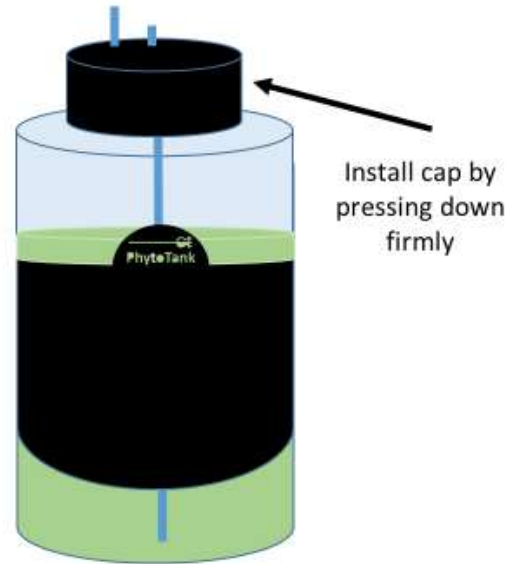
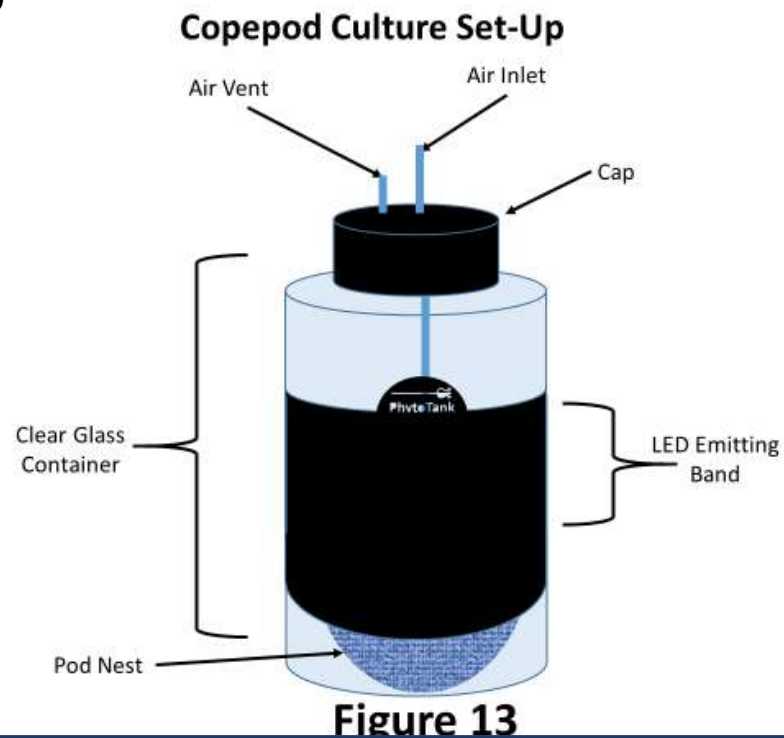


Figure 12

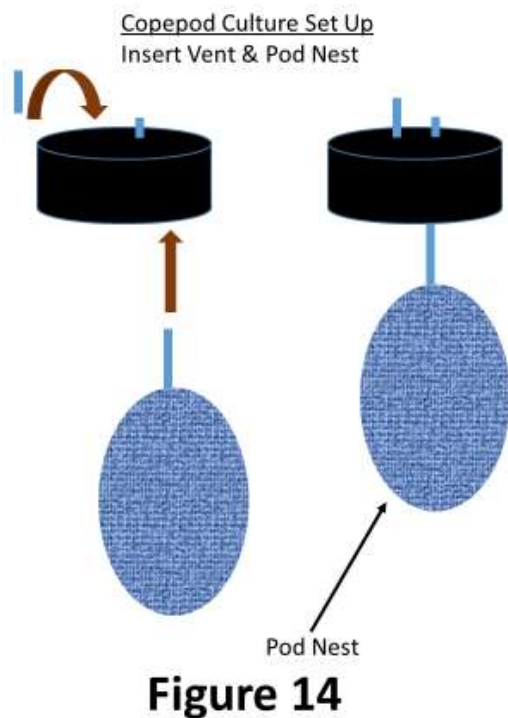
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# Copepod Culture Set-Up

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## Copepod Culture Set-Up

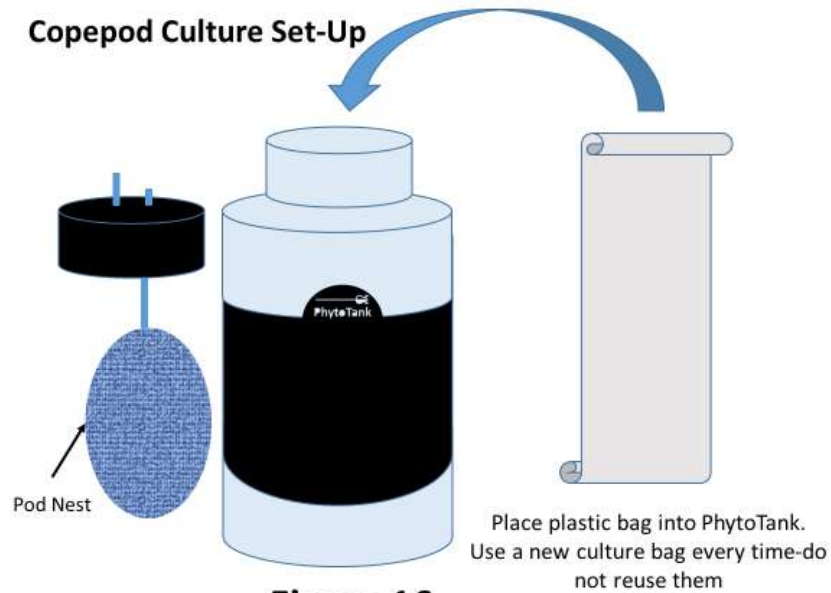


Figure 16

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## Copepod Culture Set-Up

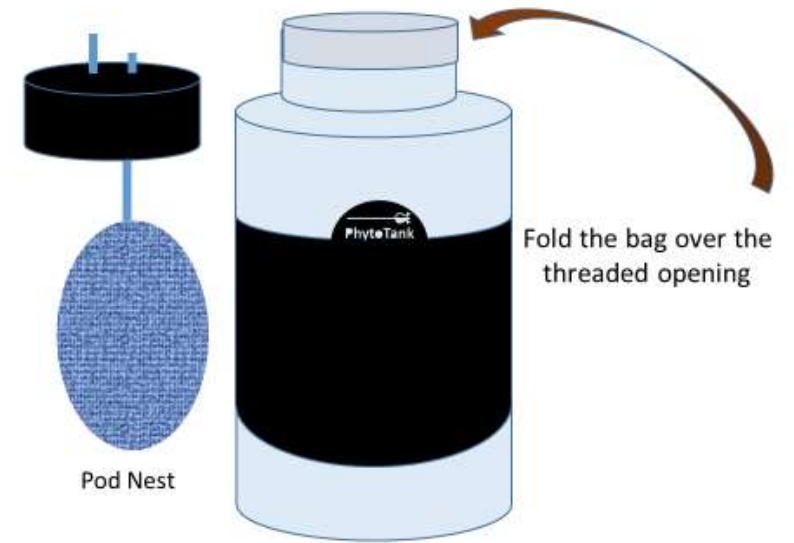


Figure 17

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## Copepod Culture Set-Up

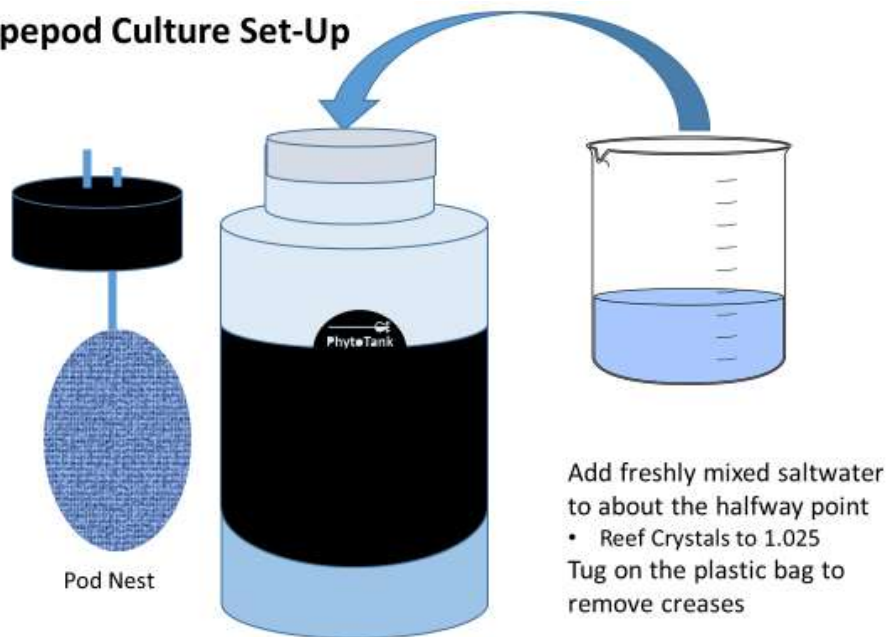


Figure 18

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## Before you add the copepods!

- If you've never grown copepods please observe them in the pouch prior to adding them to the PhytoTank so that you know what to expect when you harvest them
- It will help to hold the pouch in front of a bright light
- The variation in copepod sizes is what you should expect to see in your cultures



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## Copepod Culture Set-Up



Figure 19

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## Copepod Culture Set-Up

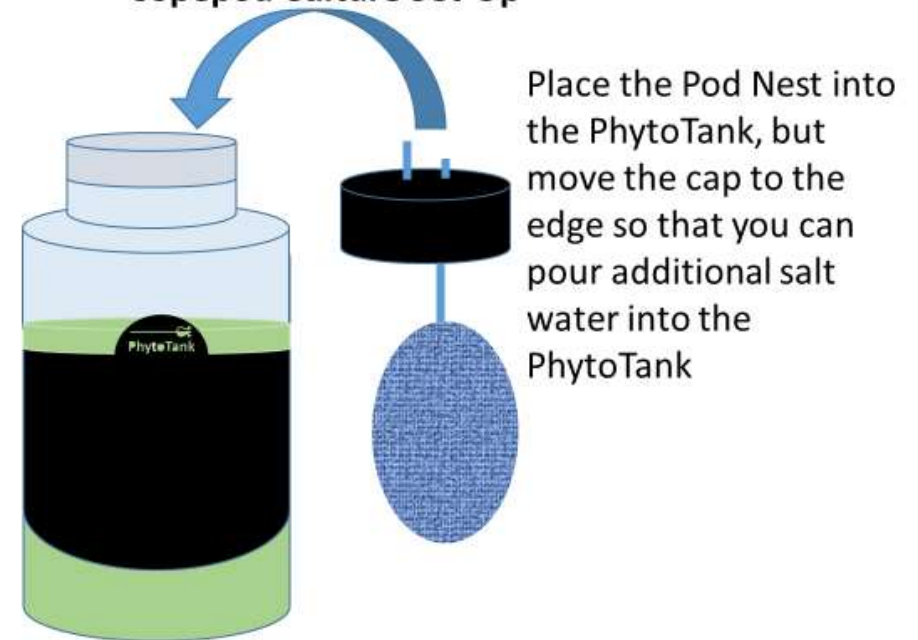


Figure 20

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## Copepod Culture Set-Up

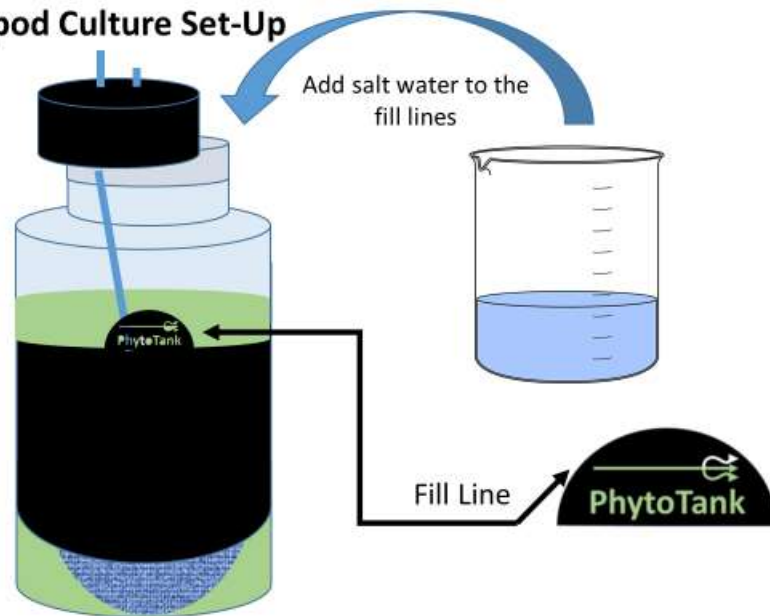


Figure 21

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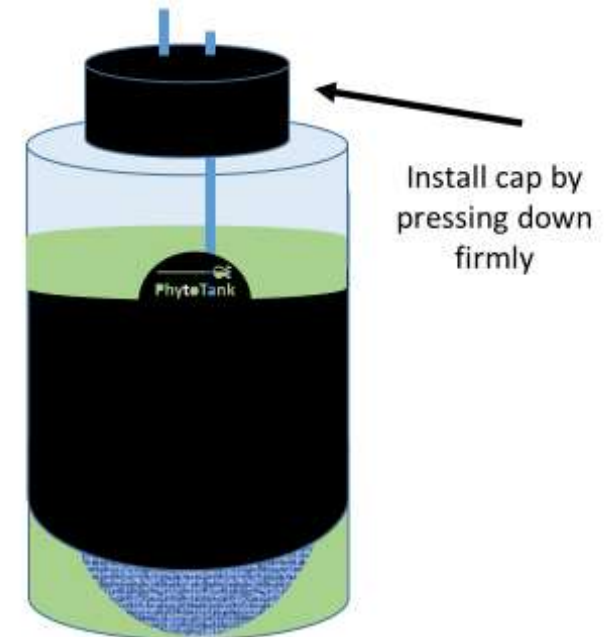
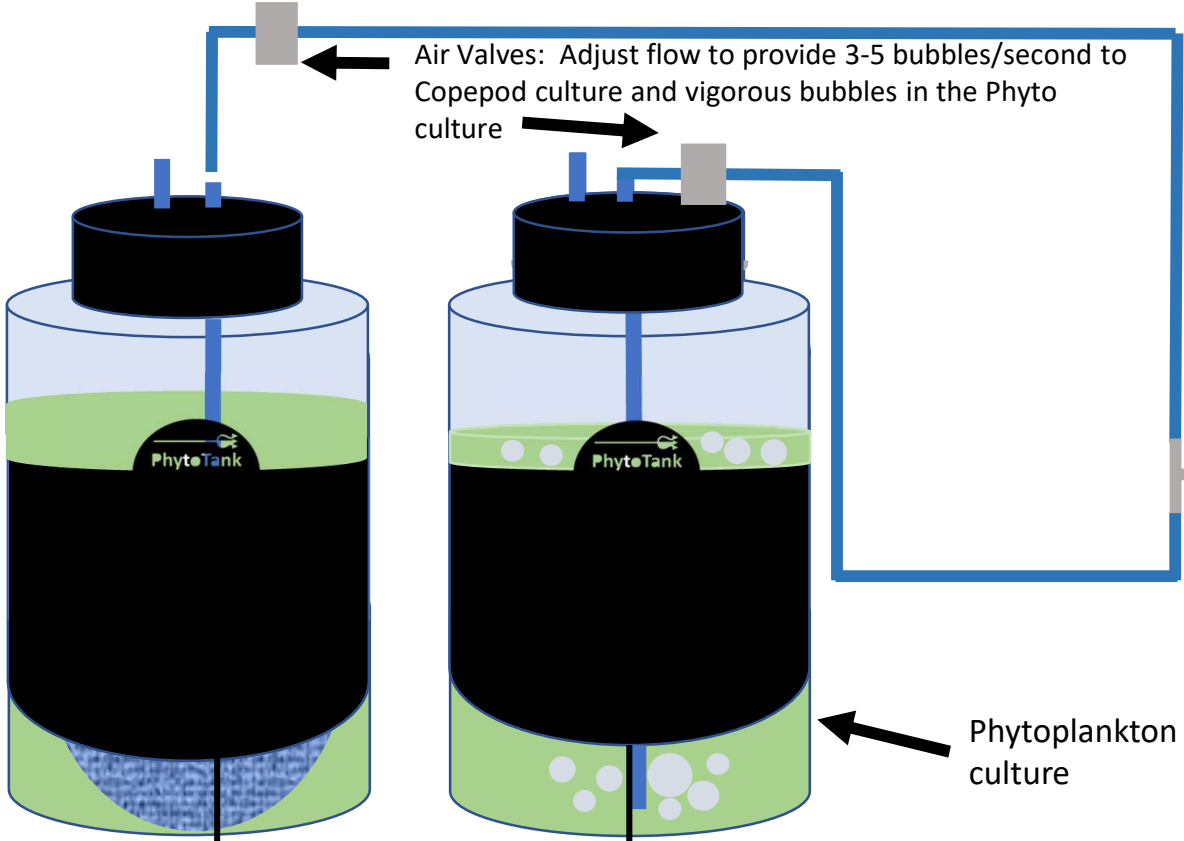


Figure 22

**Attach air supply & LED power supply**

Copepod culture



Air Valves: Adjust flow to provide 3-5 bubbles/second to Copepod culture and vigorous bubbles in the Phyto culture

Air Pump

Air Filter

Air Splitter

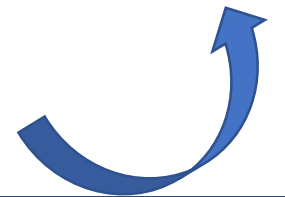
Phytoplankton culture

**Figure 23**

Dimmer: Set light level at about 50%

Two-way Power Supply Splitter

Recommend an outlet timer set to a 16 hour light and 8 hour dark cycle



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### Controlling airflow

- Use the air valves to control the aeration. Provide 3-5 bubbles per second to the copepod culture and vigorous aeration to the phytoplankton culture.
- Increase airflow if the Phyto settles out in your Pod culture
- If you were provided a 3 or 4 way airline you have the option of controlling airflow at the gang valve, or at the PhytoTank aeration port.

### Light/Dark Cycle

- Use an outlet timer to set a 16 hr. light, 8 hr. dark cycle
- Make sure the timer is working properly because if the culture is exposed to 24 hr. light it will crash

### Dimmer Switch

- Place the dimmer switch after the power supply splitter, connected directly to the PhytoTank you use to grow pods. The phyto culture must be grown in full light.

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During your first run, your pod culture may begin to clear in a few days:

- This is because the pods have consumed most of the 250 ml of phyto used to get the system started
- In addition, phyto can settle out in the Pod reactor due to the gentler air flow through the PodNest
- Let the culture run for the full 7 days so that you will have a lot more phyto to restart the next pod culture
- After that initial run you will be able to add a lot more phyto to promote significant pod reproduction



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**Add fresh water if the level drops below the fill line due to evaporation**

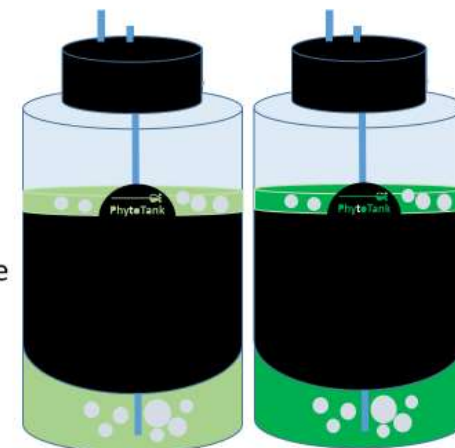


**Figure 24**

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**After 7-10 Days**

**Copepods:**  
Use sieve to filter out the copepods (see below).



**Phytoplankton:** Remove 250 ml to restart the next phytoplankton Culture.

Use at least 1 liter to feed the next copepod culture. Larger amounts can be used to get denser copepod cultures.

The remainder of the Phyto can be used for other purposes.

**Figure 25**



## Observing Copepods

Copepods are very small and difficult to see.

**On the sieve:** Before you reverse the sieve to pour water through it to recover the copepods shine a bright light on the sieve and you can see the copepods swarming on the sieve surface. A magnifying glass will help.

**After recovery:** Recover the copepods into a clear container and hold it up to a bright light

## Copepod Harvest: Suggested set-up for using the sieve

1. Start with a 5 gallon plastic bucket and lid ( a Home Depot bucket is perfect for this)
2. Place the sieve on the center of the lid with the smaller diameter end resting on the lid.
3. Use a sharpie or other marker to trace the sieve.
4. Use a utility knife to cut the traced circle out of the lid.
5. When ready to harvest pods place the lid on the bucket and insert the small diameter end of the sieve into the hole.

(\*Bucket not included)



**Copepod Harvest: Carry out these steps in session to avoid drying out the copepods on the sieve**

1. Remove the cap with the Pod Nest still attached to the bulkhead.
2. Submerge the Pod Nest in freshly mixed saltwater multiple times
3. Place the Pod Nest into a new culture bag and set aside.
4. Pour the water used to rinse the Pod Nest (from step #2) through the sieve
5. Pour the remaining copepod culture from the culture bag through the sieve
6. Remove the culture bag from the PhytoTank and then add 500 ml of freshly mixed saltwater to the culture bag and shake it vigorously. This step is to capture any remaining pods left in the bag
7. Pour contents of the bag through the sieve and then repeat  
Tip: If detritus slows down the filtering step, then gently stir the liquid in the filter with something soft like the bulb of our plastic droppers. You can also remove any hair algae that may have accumulated in the copepod culture
8. Invert the sieve and collect the copepods by pouring about 1 liter of freshly mixed saltwater through it.
9. If you don't see a lot of pods, then do not remove any of them and let the culture mature for another week long culture cycle. However, if you have a large number of pods then you can remove some of them to add to your display tank or refugium.
10. Stir the contents before removing pods so that any detritus is evenly suspended in the water
11. Remove a portion of the copepods for addition to your reef tank.
12. Place the culture bag with the Pod Nest into the PhytoTank
13. Add the remainder of the copepods to the culture bag in the phytoTank.
14. Fill to the fill line with phytoplankton and saltwater.
15. Press the cap in place and set up the culture as per Figure 23
16. Periodically vigorously clean the Pod Nest if it accumulates a significant amount of detritus



## Establishing Your Pod Colony

- Local conditions will vary, so you'll need to experiment with your system.
- Remove 250 ml of phyto and set it aside to start your next phyto culture. The remainder can be used to store backup cultures, add to your display tank, or feed to your pods.
- You should let your pod numbers build up before you start removing some each week.
- When you get a good population growing you can typically remove 50% each week and return the rest to the PhytoTank to repopulate your colony.
- If you recover your pods off the sieve in 1000 ml of saltwater and remove 500 ml, then you have about 3,000 ml to play with for phyto and saltwater to fill the PhytoTank.
- Your goal should be to add phyto once at the beginning and then not touch the PhytoTank until you harvest 7 days later.
- The more pods in your colony, the more phyto it will take. You'll need to play around with the amount of pods you remove each week and the amount of phyto you add.
- You can't overdose phyto and at the same time your pods won't starve if the water loses its green tint before day 7.
- Even though the water in your pod PhytoTank may look clear before day 7 there is still a lot of phyto in the water-the pod tank also doesn't have a lot of water movement and so phyto can settle out-the pods will rot around in the phyto at the bottom of the tank.

## PodNest Maintenance & Use

- Cleaning or disinfecting your PodNest
  - Use a stiff brush to remove algae or other detritus
  - If your culture crashes, it's a good idea to disinfect your PodNest to get rid of any contaminating microorganisms by soaking it for 10 minutes in a 5% solution of household bleach
  - Thoroughly rinse the bleach out of your PodNest before returning it to service
- Replacing the PodNest aeration tube
  - Your PodNest came with an extra aeration tube. To replace it just grasp it firmly and pull it out of the PodNest. Slide the replacement into the central hole until it bottoms out and then pull it out slightly to allow for air flow.
- Using your PodNest with an aerator
  - If you want to use a PodNest as a habitat in your sump, then you will need to hook the PodNest to a standard  $\frac{1}{4}$  inch airline. Your PodNest came with a short length of tubing. Use it as an adapter by sliding it on the end of the PodNest aerator tube and then secure the airline to the adapter.

## What if your phyto crashes?

- There are four main causes:
  - Inferior water quality: Use high quality RO water with zero TDS to make your saltwater
  - Contaminating microorganisms: Clean everything & don't let anything you use come in contact with your display tank water
  - Too much light: Set a 16 hour light, 8 hour dark cycle-if you use a mechanical outlet timer periodically check it to make sure it stays set to "Timer" and not "On."
  - Too much heat: If you place your PhytoTanks in a crowded small compartment with lots of other heat-generating gear, then the culture might overheat. Relocate the PhytoTank or place a fan in the compartment to move air around and keep the area cool
- SEE THE TIPS & TRICKS SECTION FOR MORE POINTERS



## Tips & Tricks

**Periodically clean your hands:** Clean your hands with rubbing alcohol as you work, particularly when switching between phyto and pod culture work.

**Make sure rubbing alcohol evaporates:** Small amounts of residual alcohol can crash your culture so make sure it evaporates before setting up the PhytoTank.

**Water quality:** Make sure to use high-quality RO water with 0 TDS to make your saltwater. If you use a lot of saltwater, consider storing it in a clean container and continuously circulate the saltwater through a UV light to hold down contamination.

**Keep implements separate:** Use separate implements like pumps, tubing, containers etc. for phyto and pod cultures. If possible, use separate work spaces to manage phyto and pods because if pod cultures come in contact with phyto it can lead to contamination. Also make sure you don't use any implements that come in contact with your display tank because there are a lot of competing organisms in your display tank water that will contaminate a phyto culture.

**Disinfection:** If your culture crashes, soak the rubber cap in 5% household bleach for 5-10 minutes. Thoroughly rinse the cap off before use. Also wipe down the PhytoTank surfaces with rubbing alcohol.

**Light/Dark Cycle:** Make sure your outlet timer is working properly and delivering 16 hours light/8-hour dark cycle. Make sure the dimmer is connected to the Pod culture and the phyto culture gets full light.

**Back-up cultures:** Store samples of phyto in the fridge in a clean capped container to restart your cultures in the event of a culture crash. Periodically shake the cultures to keep the phyto suspended. Replace the back-up cultures every few weeks. Nano can be stored in the refrigerator for 90 days and still effectively start a new culture.

**Inoculation & culture duration:** Get in the routine of starting cultures on a 7-day schedule using the same inoculation level each time. Your results may vary, but a good starting point is 250ml of phyto for a PhytoTank-L reactor.

**If contamination persists:** Consider replacing the air filter and tubing.

# Phytoplankton Dosing & Storage

Phytoplankton is the basis of the marine food chain. Reef keepers have reported excellent coral and invertebrate growth and maintenance by dosing with phytoplankton.

The volume of phytoplankton that you add to your reef tank depends on the nutritional demands of your system. Consequently, you will need to experiment with your system to arrive at the optimum dose. Guidelines have been published by a number of phytoplankton suppliers suggesting a dose of 5 ml per 10 gallons, 3-4 times per week.

## **Manual Dosing:**

- Phytoplankton can be dispersed in the water column or you can directly target feed specimens. It is recommended that you turn off protein skimmers for 30-60 minutes after dosing phytoplankton.

## **Automated Dosing:**

- You can grow a phytoplankton culture using the PhytoTank with the Culture Cap and then use a PhytoTank with a Dosing Cap to maintain the culture for 7-10 days for automated dosing using a dosing pump. One option is to use two PhytoTanks, one to grow a culture while a second PhytoTank is used for dosing the culture that you grew the previous week (retaining a small amount to use a starter culture each week).

## **Storage:**

- Phytoplankton can be refrigerated for future dosing or culturing. Experimental data suggests that phytoplankton can remain viable in the refrigerator for as long as 5 months (with weekly shaking to prevent settling). However, in our hands, phytoplankton stored for more than 90 days is less effective as a starter culture. If you use refrigerated phytoplankton as a starter culture, then you may observe a lag period before additional growth is observed. This is particularly noticeable for *isochrysis galbana* wherein you may see the culture become significantly lighter in the first few days of culture and then it will gradually get darker. This lag period is not observed if you start a new culture with fresh phytoplankton that has never been refrigerated.

Poseidon Reef Systems 

**STARTER CULTURE GUARANTEE**

If you purchase a system from [www.poseidonreefsystems.com](http://www.poseidonreefsystems.com) and your culture crashes for any reason we will provide free replacement starter cultures for a \$22.50 shipping and handling charge. Simply place an order for the *Starter Culture Guarantee Fulfillment* on our website (<https://poseidonreefsystems.com/products/starter-culture-guarantee-fulfillment>)

Make sure you keep the quantity as "1" in your cart because it's a flat rate deal

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