

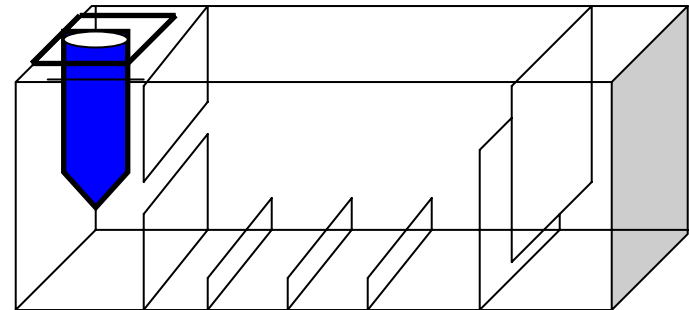


OWNER'S MANUAL

ECOSYSTEM MIRACLE MUD® FILTER



Bringing You Closer To Nature



UNITED STATES

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DELUXE SUMP MODELS

DEL 2410

DEL 3012

DEL 3612

DEL 3616

DEL 4822

DEL 7222



NOTES



NOTES



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Dear Aquarium Enthusiast-

Congratulations on purchasing a Deluxe EcoSystem Miracle Mud® Filter.

This revolutionary product is part of the EcoSystem Method – an innovative approach to aquarium keeping that is based on sound principles of ecology. Utilizing time tested and proven products, the EcoSystem Method simulates the aquatic environments found in nature. In these ideal conditions your fish, corals and plants will thrive and flourish with minimal maintenance.

So enjoy creating your ultimate aquarium!



For Customer Service and Technical Assistance:

Contact an EcoSystem Aquarium technician at:

- 714-543-4100 (Monday-Friday)
(9 A.M. - 4P.M. PST)

- info@ecosystemaquarium.com

Retain this OWNER'S MANUEL with your sales receipt as a record of your purchase, in the event of a warranty service.

TO THE DURATION OF THIS WARRANTY. No EcoSystem Aquarium reseller, representative, or employee is authorized to make any modifications, extension, or addition to the warranty. Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages or exclusions or limitations on the duration of implied warranties or conditions, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary by state or province.

HOW TO OBTAIN WARRANTY REPAIRS/REPLACEMENT

If you purchased the product in the U.S. or Canada, deliver the product, at your expense, to EcoSystem Aquarium - USA. If you purchased the product in Europe, deliver the product, at your expense, to EcoSystem Aquarium – Europe. If you purchased the product in other countries not mentioned above, deliver at your expense, to any EcoSystem Aquarium Authorized Dealer in the country where you purchased the product.

U.S.A. /CANADA

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Please use the original container, or pack the unit(s) in a sturdy carton with sufficient packing to prevent damage. Include the following information:

1. A proof-of-purchase (receipt) indicating model number and date of purchase.
2. Bill – to Address.
3. Ship – to Address.
4. Number and description of units shipped.
5. Name and telephone of person to call, should contact be necessary.
6. Reason for return and description of the problem.

Damage occurring during shipment is deemed the responsibility of the carrier, as claims should be made directly with the carrier.



EcoSystem Aquarium (1) Year Limited Warranty

LIMITED WARRANTY COVERAGE

EcoSystem Aquarium warrants to the original purchaser that, except for limitations and exclusions set forth below, this EcoSystem Aquarium manufactured product shall be free from defects in materials and workmanship for a period of one (1) year from the date of original retail purchase (“Warranty Period”). The obligation of EcoSystem Aquarium under this Limited Warranty shall be limited to repair or replacement, at EcoSystem Aquarium option, without charge, of any part or unit that proves to be defective in material or workmanship during the Warranty Period.

EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to product manufactured by EcoSystem Aquarium. The Limited Warranty does not apply to any non-EcoSystem Aquarium manufactured products, even if packaged or sold with EcoSystem Aquarium products. Non-EcoSystem Aquarium manufacturers, suppliers, or publishers may provide their own warranties. Please contact an EcoSystem Aquarium representative for more information on non-EcoSystem Aquarium manufacturers.

This Limited Warranty applies only to defects in factory materials and factory workmanship. This Limited Warranty does not apply: (a) any conditions or damage caused by an accident, abuse, misuse, destruction, alteration, improper operation or violation of instructions furnished by EcoSystem Aquarium; (b) any conditions or damage caused by improper electrical voltages or currents; or (c) any conditions or damage caused by repair or maintenance attempted by anyone other than the EcoSystem Aquarium.

THIS WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL, WRITTEN, EXPRESS OR IMPLIED. ECOSYSTEM AQUARIUM SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF ECOSYSTEM AQUARIUM CANNOT LAWFULLY DISCLAIM IMPLIED WARRANTIES UNDER THIS LIMITED WARRANTY, ALL SUCH WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED

	PAGE
I. Safety Instructions	1
II. Introduction	
A. The EcoSystem Methodology	3
B. Deluxe EcoSystem Miracle Mud® Filter	4
III. Sump Models – Description	5
IV. List of Components	
V. Set up Procedures	
A. New Aquarium	
1. Plumbing	7
2. Deluxe EcoSystem Miracle Mud® Filter	11
3. Livestock	14
B. Existing Aquarium	
1. Plumbing	17
2. Deluxe EcoSystem Miracle Mud® Filter	18
VI. Maintenance	19
VII. Questions and Answers (Q & A)	21
VIII. EcoSystem Aquarium Product Line	25
IX. Warranty Information	27

IMPORTANT SAFEGUARDS – To avoid injury, basic safety precautions should be observed. PLEASE READ AND FOLLOW ALL SAFETY INSTRUCTIONS BEFORE PROCEEDING.

DANGER – To avoid possible electric shock, special care should be taken in the use of aquarium equipment. For each of the following situations, DO NOT attempt any repairs yourself; return the appliance to an authorized service facility.

1. READ AND OBSERVE ALL THE IMPORTANT NOTICES ON ALL ELECTRICAL APPLIANCES.
2. Do not use an electrical appliance for other than intended use. The use of attachments not recommended or not sold by the appliance manufacturer may cause an unsafe condition.
3. Do not operate any appliance if it has a damaged cord or plug, if it is malfunctioning, if it is dropped or damaged in any manner.
4. Make sure an appliance mounted on a tank is securely installed before operating it. Do not install or store the appliance where it will be exposed to the weather or to temperatures below freezing.
5. To avoid the possibility of the appliance plug or receptacle getting wet, position the aquarium stand and tank to one side of a wall mounted receptacle to prevent water from dripping onto the receptacle or plug. A “drip loop”, should be arranged by the user for each cord connecting an aquarium appliance to the receptacle. The “drip loop” is that part of the cord below the level of the receptacle. If the plug or receptacle does get wet, DO NOT unplug the cord. Disconnect the fuse or circuit breaker that supplies power to the appliance. Then unplug and examine for presence of water in the receptacle.

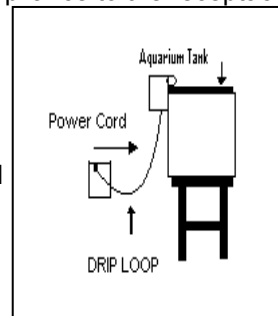


Diagram 1 –

Drip Loop

ECOSYSTEM REEFUGIUM

(For Marine only – used as refugium, NOT filter)

- ❖ **Reefugium 100** (for up to 120 gallons aquarium)
(for up to 454.20 liters aquarium)
- ❖ **Reefugium 200** (for up to 200 gallons aquarium)
(for up to 757.00 liters aquarium)

MEDIA SUBSTRATE

- ❖ **Miracle Mud** - Media for marine aquarium
- ❖ **Miracle Mud II** - Media for freshwater aquarium
- ❖ **Miracle Mud III** - Media for koi pond

HEALTH MAINTENANCE

- ❖ **Garlic Elixir™** - Food additive that acts as an antibacterial and antifungal health supplement that repels parasites.

SUPPLEMENTS

- ❖ **Fish Solution™** - All natural / all in one additive for marine fish aquarium.
- ❖ **Fresh Solution™** - All natural / all in one additive for freshwater aquarium.
- ❖ **Koi Solution™** - All natural / all in one additive for koi pond.
- ❖ **Reef Solution™** - All natural / all in one additive for reef aquarium.

PHOSPHATE REMOVER

- ❖ **ECO Phos™** - Phosphate and silicate remover



ECOSYSTEM MIRACLE MUD® FILTER

(Available as Marine and Freshwater setups)

❖ Hang On The Back

- 40 (for 10 - 40 gallons aquarium)
(for 37.85 – 151.42 liters aquarium)
- 60 (for 40 – 60 gallons aquarium)
(for 151.42 – 227.10 liters aquarium)

❖ Sump Models

- 2410 (for 40 – 65 gallons aquarium)
(for 151.42 – 246.05 liters aquarium)
- 3012 (for 75 – 100 gallons aquarium)
(for 283.91 – 378.54 liters aquarium)
- 3612 (for 120 – 135 gallons aquarium)
(for 454.25 – 511.30 liters aquarium)
- 3616 (for 150 – 500 gallons aquarium)
(for 567.81 – 908.50 liters aquarium)
- 4822 (for 300 – 500 gallons aquarium)
(for 1135.62 – 1892.70 liters aquarium)
- 7222 (for 500 – 1000 gallons aquarium)
(for 1982.70 – 3785.40 liters aquarium)

2 Class Categories:

1. **DEL** – Deluxe EcoSystem Miracle Mud® Filter
(with prefilter 200 micron bag in first chamber)
2. **PRO** – ProSeries EcoSystem Miracle Mud® filter
(with Protein Skimmer in first chamber)
ProSeries available as Marine Setup Only.



6. Carefully examine the appliance after installation. It should not be plugged in if there is water on parts not intended to be wet.
7. If the appliance shows any signs of abnormal water leakage, immediately unplug from power source.
8. If the appliance falls into the water, DO NOT reach in for it. First, unplug it from the power source, then retrieve it.
9. The light fixture has a polarized plug (one blade is wider than the other). As a safety feature, this plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. Never use with an extension cord unless the plug can be fully inserted. DO NOT attempt to defeat this safety feature. – USA units only
10. If an extension cord is necessary, a cord with a proper rating should be used. A cord rated for fewer amperes or watts than the appliance rating may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
11. Always unplug from outlet when not in use, before putting on or taking off parts, and before cleaning. Never yank the cord to pull the plug out from the outlet. Grasp the plug and pull to disconnect.
12. To avoid injury, do not make contact with moving parts or hot parts such as heaters, reflectors, light bulbs, light fixtures, etc.
13. Close supervision is necessary when any electrical appliances are used by or near children.

Save these instructions. EcoSystem Aquarium® will not be held responsible or liable for damage to persons, appliances, animals and/or aquariums that result from negligent care and failure to follow safety precautions and instructions on the part of the consumer.



THE ECOSYSTEM METHODOLOGY

The EcoSystem Method is an innovative approach to aquarium keeping based upon the ecological principles of microbiology and photosynthesis. Utilizing time tested and proven products, the EcoSystem Method simulates the environment found in natural coral reefs and natural freshwater biotopes. The components of the EcoSystem Method include:

EcoSystem Miracle Mud® Filter – a unique biological system with multiple functions. With this revolutionary system you are getting several systems in one unit as it functions as:

- an Advance Biological Filtration System
- a Water Enrichment System
- A Refugium

These three processes allow an EcoSystem Miracle Mud® Filter to efficiently filter the water of organics and toxin while enriching the water column with essential trace elements, minerals, phytoplankton and other food source.

EcoSystem Aquarium's Solutions: Reef Solution™, Fish Solution™, Fresh Solution™, Koi Solution™ – all natural additives that are ideal for your aquarium as they contain a variety of elements, vitamins and minerals that are vital to the well-being of your aquarium. They help maintain vibrant colors of your animals, prevent diseases (i.e. Head and Lateral Line Erosion Disease – H.L.L.E.) and promote the exceptional health of your fish, corals and plants.

Garlic Elixir™ – a water soluble, natural food supplement made of pure garlic, vitamins and minerals. Utilizing the medicinal properties of garlic, it helps repel ICH and parasites in your fish as it acts as an anti-fungal and anti-bacterial agent. When used on a daily basis, mixed into the food, it boosts up the immune system of the fish making them less susceptible to diseases.

(Please see pg.25-26 for information on complete product line)



9. ***Do I need to add any supplements to the tank?***

Not necessarily. Miracle Mud® is formulated to include minerals and essential elements that are released into the water – enriching the water column. With an EcoSystem Miracle Mud® Filter, your setup will have sufficient levels of iodine, strontium, magnesium, calcium and other elements without adding any supplements. However in an aquarium with more calcium /magnesium demanding animals (clams, small polyp stony corals, coralline algae...) you may need to supplement for calcium, magnesium and/or buffer.*

*Please test the water first before adding any supplements. Only add what is needed by the tank to reach an ideal range.

10. ***Are there any other product that I should use with an EcoSystem Miracle Mud® Filter?***

For an exceptionally successful setup, aside from having an EcoSystem Miracle Mud® Filter, we recommended the following regimen:

1. Use daily one of the following solutions:
 - a. **Reef Solution™**
 - b. **Fish Solution™**
 - c. **Fresh Solution™**
2. Feed animals with food marinated in **Garlic Elixir™**
3. Add calcium and buffer only if and when needed.
4. Use **ECO Phos™** on regular basis to control phosphate level – monitor dKH level in marine tanks.

11. ***Are there any chemicals that should NOT be used?***

Never use copper in an EcoSystem Miracle Mud® Filter – this will irreversible damage the system. Do not use harsh chemicals (medicine, treatment, metals).

If your question(s) has not been addressed in this section, please contact your local fish store, an EcoSystem Aquarium technician or visit our FAQ site at:
www.ecosystemaquarium.com

6. Is the 24 hr. lighting an important aspect of the EcoSystem Miracle Mud® Filter?

Yes - the unique 24 hour lighting period is important to the EcoSystem methodology as it prevents caulerpa from undergoing sexual reproduction that leads to its disintegrate as well as from producing gelvin which makes the water yellow. The 24 hour lighting also helps to keep the pH stable.

7. What about red slime algae (cyanobacteria)?

During the initial set up of your aquarium tank, it is normal to have red slime algae and perhaps other nuisance algae due to excess nutrients in the water. However as your aquarium stabilizes, the nuisance algae should disappear. To help facilitate this process, siphon out the nuisance algae or remove with your hand.* In the case that this problem persists – make sure that there is enough current flow in the EcoSystem Miracle Mud® Filter as recommended. To increase current flow – a powerhead may be placed in Chamber 2 directed so that it is blowing over and across the Miracle Mud® bed in order not to disturb it.

* Please note that it is NOT recommended to use harsh chemicals as it can harm coral or fish so please take precautions when using chemical solutions.

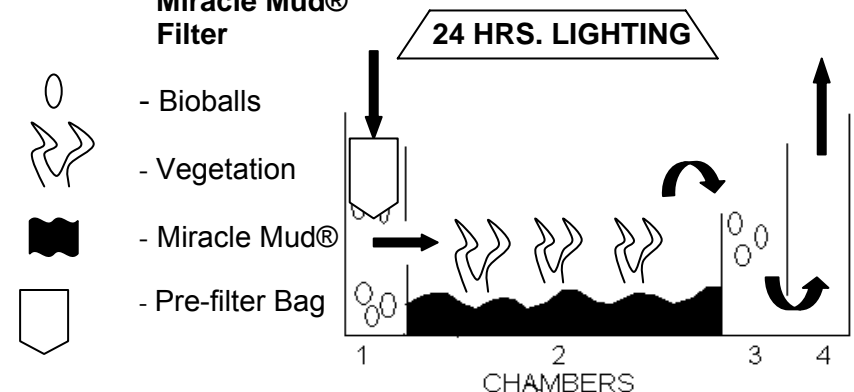
8. Do I need to get a different refugium with my setup?

No – you do not need to purchase and set up another refugium for your aquarium. The EcoSystem Miracle Mud® Filter functions as a refugium as well as an advance filter and water enrichment system. This means that you do not need to add any phytoplankton or zooplankton for your filter-feeding corals as enough of these natural food sources will be produced in your EcoSystem Miracle Mud® Filter. You will however need to still feed your fish as there will not be enough copepods, amphipods or other live food for your fish.

DELUXE ECOSYSTEM MIRACLE MUD® FILTER

The Deluxe EcoSystem Miracle Mud® Filter begins with water from the aquarium tank entering into Chamber 1 of the filter sump, The water flows through the pre-filter 200 micron bag which collects large particles of waste and though bioballs or live rock that dissipate any air bubbles. The water continues to flow through the outlet slot into Chamber 2, the main filtration chamber. In this chamber a bed of macro algae / plant (refer to recommended vegetation, pg. 13) is grown in the Miracle Mud® substrate under 24hrs. lighting. Within this Miracle Mud® bed, nitrogen fixation and denitrification occurs, reducing nitrate into harmless by-products. Vegetation grown in the Miracle Mud® bed aid the toxin removal process by lowering the level of phosphate and nitrate in the water through the conversion of nitrogenous waste products into plant biomass and by providing oxygen through photosynthesis. The Miracle Mud® bed also enriches the water column through the constant release of trace elements, essential minerals, phytoplankton and organisms. These biological processes contribute to the high quality of water that is produced which is essential for the ideal aquatic conditions needed by your fish, corals and plant. The enriched water then flows into Chamber 3 where the bioballs prevent the macro algae / plant form entering into the pump chamber. The enriched water is then finally pumped back into the aquarium via Chamber 4.

Diagram 2-Deluxe EcoSystem Miracle Mud® Filter





Deluxe EcoSystem Miracle Mud® Filters are available in the following models:

Table 1 – Deluxe Model, Designations & Dimensions

MODELS	DESCRIPTION
DEL 2410	For aquarium tank : 40 – 65 gallons 151.42 – 246.05 liters Dimensions : 24" L x 10" W x 12" H 60.96cm L x 25.40cm W x 30.48cm H
DEL 3012	For aquarium tank : 75 – 100 gallons 283.91 – 378.54 liters Dimensions : 30" L x 12" W x 16" H 76.20cm L x 30.48cm W x 40.64cm H
DEL 3612	For aquarium tank : 120 – 135 gallons 454.25 – 511.03 liters Dimensions : 36" L x 12" W x 18" H 91.44cm L x 30.48cm W x 45.72cm H
DEL 3616	For aquarium tank : 150 – 240 gallons 567.81 – 908.50 liters Dimensions : 36" L x 16" W x 18" H 91.44cm L x 40.64cm W x 45.72cm H
DEL 4822	For aquarium tank : 300- 500 gallons 1135.62 – 1892.70 liters Dimensions : 48" L x 22" W x 22" H 121.90cm L x 55.88cm W x 55.88cm H
DEL 7222	For aquarium tank : 500 – 1000 gallons 1892.70 – 3785.40 liters Dimensions : 72" L x 22" W x 22" H 182.88cm L x 55.88cm W x 55.88cm H

L = Length W = Width H = Height

ALL MODELS ARE AVAILABLE AS MARINE OR FRESHWATER



3. Do I need to use a protein skimmer?

A protein skimmer is NOT REQUIRED with an EcoSystem Miracle Mud® Filter. If the EcoSystem Miracle Mud® Filter is adequately cycled and matured (refer to setup process, pg. 11-13) the Miracle Mud® becomes a very advance filtration medium. It has been found that using a protein skimmer limits the benefits of an EcoSystem Miracle Mud® Filter as the skimmer tends to overskim the water including phytoplankton and all of the minerals and essential elements that the Miracle Mud® releases.

If you intend to use a protein skimmer – we recommend positioning it BEFORE your EcoSystem Miracle Mud® Filter and having it ON when necessary.

4. How do you get caulerpa (macro algae) / plants to grow?

It may take couple of attempts to get the caulerpa (macro algae) plant to grow. In the case that you find yourself unsuccessful after several attempts-

1. make sure that it is properly planted (refer to pg. 13)
2. make sure that it is under 24 hours lighting
3. in the case that the caulerpa / plant may not have enough nutrient to live off of –place a peeled, raw, dead shrimp within Chamber 2 / Miracle Mud® bed.
4. in the case that the caulerpa / plant is not getting enough CO₂ – cover the top of Chamber 1 to trap CO₂

5. Is it necessary to have caulerpa (macro algae) / plants in an EcoSystem Miracle Mud® Filter?

NO it is not necessary to have vegetation in the filter as the Miracle Mud® is responsible for the filtering and water enrichment aspect of this methodology. However caulerpa (macro algae) / plant offers many benefit to an EcoSystem including: pH stabilization, control against nuisance algae, helps filter water of nitrate and phosphate and is part of the food web cycle.



1. **Can I have substrate (live sand, aragonite, crush coral) in my tank?**

With an EcoSystem setup, substrate in the main tank is purely for aesthetic purposes and also to provide a home for sand-dwellers. Therefore if you plan to have substrate in your main tank we suggest to keep it **LESS THAN 1" (2.54CM) DEEP** (the less the better).

There are **disadvantages** to having substrate in your tank:

- (1) A substrate bed is a source of nitrate and phosphate. With a substrate bed, detritus is able to collect within it. This will then lead to colonization of bacteria that feed off of the detritus. The bacteria themselves produce bioload therefore the nitrate/phosphate level will never be at negligible level within a tank with substrate. This leads to a less ideal aquatic condition and may limit the types of animals you can have. If the substrate bed is not kept clean – with time the bioload produced within the substrate will be uncontrollable which may result in causing a major imbalance and high ammonia, nitrate and/or phosphate level in your aquarium.
- (2) A substrate bed means more maintenance for you. You will have to regularly vacuum siphon your substrate to remove all of the accumulated detritus. Siphon routine frequency is dependent on the substrate.
 - a. Once a week if the substrate level is 1" (2.54cm)
 - b. Once every 2 week if the substrate level is 1/2" (1.75cm) or less.

REMEMBER HAVING MORE THAN 1" (2.54 CM) DEEP SUBSTRATE BED WILL NEGATIVELY AFFECT YOUR TANK.

2. **Should the Miracle Mud be inoculated with animals?**

No. Once your aquarium stabilizes, many small animals will be introduced into the filter sump by the live rocks in your aquarium tank. It may take 4-6 months before you can see a large enough population of copepod, amphipods and other small organisms.



The following table indicates all of the components that are included in the Deluxe EcoSystem Miracle Mud® Filters (SUMP MODELS).

Table 2 – Components of a Deluxe EcoSystem Miracle Mud® Filter (Sump Models)

MODEL	COMPONENTS
DEL 2410	Acrylic deluxe sump, 10 lbs (4.536 kg) of Miracle Mud, (1) 13W P.C. Light, (1) 1" / 2.54 cm Bulkhead, (1) 4" / 10.16 cm 200-micron bag & Bioballs
DEL 3012	Acrylic deluxe sump, 20 lbs (9.072 kg) of Miracle Mud, (1) 18W P.C. Light, (1) 1"/2.54 cm Bulkhead, (1) 4" / 10.16 cm 200-micron bag & Bioballs
DEL 3612	Acrylic deluxe sump, 30 lbs (13.608 kg) of Miracle Mud, (2) 18W P.C. Light, (1) 1"/2.54 cm Bulkhead, (1) 4" / 10.16 cm 200-micron bag & Bioballs
DEL 3616	Acrylic deluxe sump, 40 lbs (18.144 kg) of Miracle Mud, (2) 18W P.C. Light, (1) 1"/2.54cm Bulkhead, (1) 4" / 10.16 cm 200-micron bag & Bioballs
DEL 4822	Acrylic deluxe sump, 60 lbs (27.216 kg) of Miracle Mud, (3) 18W P.C. Light, (2) 1"/2.54 cm Bulkhead, (2) 7" / 17.78 cm 200-micron bags & Bioballs
DEL 7222	Acrylic deluxe sump, 120 lbs (54.432 kg) of Miracle Mud, (4) 18W P.C. Light, (2) 1"/2.54 cm Bulkhead, (2) 7" / 17.78 cm 200-micron bags & Bioballs

P.C. Light = Power Compact Light

No pump or plumbing materials are included in any EcoSystem Miracle Mud® Filter – Sump Models. Please consult your dealer for the required materials.



**SET UP PROCEDURES
NEW AQUARIUM
Plumbing – Pg. 7**

- Materials:**
- EcoSystem Miracle Mud® Filter
 - Appropriate Pump (refer to Table 3 below)
 - PVC pipes, elbows, joints + PVC glue
 - 3 Union ball valves (PVC) – *optional*
 - T valve (PVC) – *optional*
 - Flexible Plastic Hose – *optional*

Table 3 - Suggested Flow Rate

MODEL	AQUARIUM TANK SIZE	SUGGESTED CURRENT FLOW RATE*
DEL 2410	40 – 65 gallons 151.42 – 246.05 liters	600 – 800 GPH 2271.24 – 3028.33 LPH
DEL 3012	75 – 100 gallons 283.91 – 378.54 liters	800 – 1000 GPH 3028.33 – 3785.41 LPH
DEL 3612	120 – 135 gallons 454.25 – 511.03 liters	1000 – 1200 GPH 3785.41 – 4542.49 LPH
DEL 3616	150 – 240 gallons 567.81 – 908.50 liters	1200 – 1500 GPH 4542.49 – 5678.12 LPH
DEL 4822	300 – 500 gallons 1135.62 – 1892.70 liters	2000 GPH 7570.80 LPH
DEL 7222	500 – 1000 gallons 1892.70 – 3785.40 liters	2000 GPH 7570.80 LPH

G.P.H. = Gallons Per Hour / L.P.H. = Liters Per Hour

Pump

* The suggested current flow rate is that **WITHIN** the **Deluxe EcoSystem**. Please use a pump that will allow for the appropriate flow rate taking into consideration your plumbing setup and tank/filter location.

Either submersible or external pump can be used depending on your tank setup and space availability in the tank stand.



MAINTENANCE – Pg. 20

AS REQUIRED: (continues)

2. Trimming marco algae / plant

This process promotes new macro algae or plant growth that will help purify the water and control nuisance algae outbreaks.

- a. The macro algae / plant in your EcoSystem Miracle Mud® Filter should be trimmed 1 to 2 inches or 2.54 to 5 centimeters below the water surface with a pair of scissors. DO NOT cut too much off
- b. It is NOT recommended to feed macro algae/plant trimmings to fish – as vegetation may contain high level of toxins.

After some time (1-2 years) your macro algae/plant may start to thin out, at this time we suggest replacing with new strands of macro algae/plants.

3. Cleaning out pre-filter bag*

When pre-filter bag appears to be full of debris, turn off pump, remove pre-filter bag from kit and rinse out with filter water. Place back after cleaning and turn pump on.

4. Replacing 50% of Miracle Mud

The Miracle Mud® * bed needs to be replaced in order to replenish it with the essential elements and minerals that it releases with time and that is used up by the fish, corals and plants in the aquarium. Details on performing this 50% Miracle Mud® change can be found on: www.ecosystemaquarium.com

- a. EcoSystem Miracle Mud® Filter needs to have 50% of its Miracle Mud® be replaced for the first time after 2 years from setup.
- b. After this initial replacement – 50% Miracle Mud® needs to be replaced every year afterwards.

* **You can purchase Pre-Filter Kit/Bag and Miracle Mud® from your local fish store.**

DAILY:

1. Replace evaporated water by adding fresh filtered water into the main tank. (Reverse Osmosis [RO] water may be used)
Recommended height : ~2" above 2nd and 3rd chamber divider.
2. Additives
-add appropriate EcoSystem Solutions into your tank (Reef Solution™, Fish Solution™, Fresh Solution™)
-add Garlic Elixir™
-add calcium and buffer if needed – test water first
3. Feed fish.
DO NOT feed filter-feeding corals (especially in new aquarium setup) as EcoSystem Miracle Mud® Filter produces enough phytoplankton & zooplankton.

AS NECESSARY:

1. Vacuum siphon aquarium floor + water change

Keeping the aquarium floor as clean as possible is pertinent to ensure the health of the tank – this task is easier with less substrate in the main tank. The frequency of this cleaning process depends on your tank, livestock and substrate level.

- a. Carefully unplug your aquarium pump from the power source before you begin any cleaning / water changes. **(Refer to safety instructions – Pg. 1-2)**
- b. Vacuum siphon any detritus from your live rock and from the bottom of your aquarium tank. Make sure to clean the substrate bed thoroughly. Try NOT to move live rocks around and DO NOT disturb any of the substrate bed directly underneath live rocks.
- c. Add **pre-mixed*** salt water to your marine aquarium tank OR add fresh filtered water to your tropical aquarium tank. The amount should be appropriate to your aquarium tank volume.

* **It is recommended that you mix your salt water and allow it to stand for 24 hours before using it.**

SET UP PROCEDURES FOR NEW AQUARIUMS –

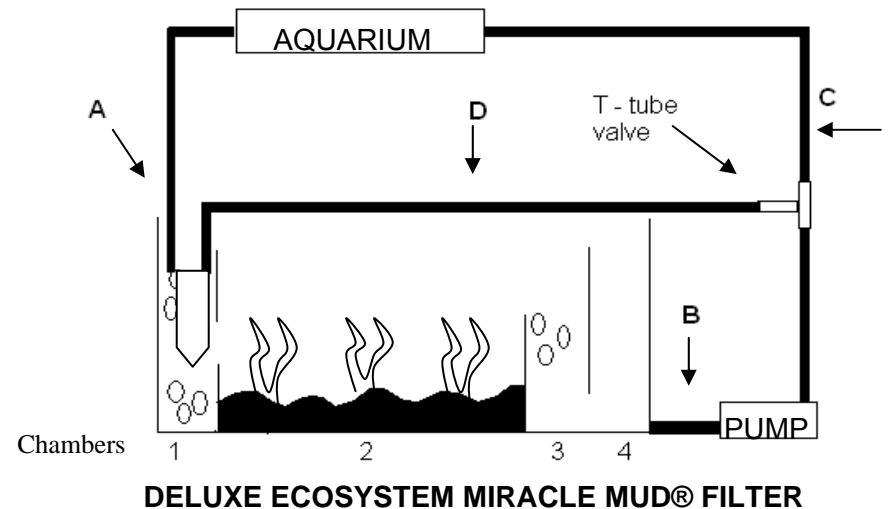
If you have an existing aquarium please proceed to set up instructions on pgs. 17-18.

PLUMBING SETUP

The following plumbing setup is suggested by EcoSystem Aquarium®. Your actual plumbing setup will be determined by your tank, your aquarium stand, the overall setup and other equipments that will be used in the setup.

Diagram 3– General Plumbing Schematic of EcoSystem Miracle Mud® Filter (refer to pg. 9-10 for details)

- A : Aquarium → EcoSystem Filter
- B : EcoSystem Filter → Pump (external pump only)
- C : Pump → Aquarium
- D : Back – up flow (optional)



Frontal view – not representative of actual size



SET UP PROCEDURES NEW AQUARIUM Plumbing – Pg. 9

PLUMBING PROCEDURES:

A Aquarium → EcoSystem Filter

Connect aquarium to Chamber 1 of the Deluxe EcoSystem Miracle Mud® Filter with appropriate plumbing *(PVC pipes or plastic hose). Please position the plumbing so that the opening of the pipe/hose is submerged in the water among the floating bioballs or live rock (about 2" / 5.08cm above the 1" / 2.54cm opening between Chamber 1 & 2).

- For an aquarium WITH a built-in overflow box
---connect the overflow box drainage opening with appropriate plumbing
- For an aquarium WITHOUT a built-in overflow box
---purchase an overflow/skim box (available from your dealer) and connect with appropriate plumbing.

* Please make sure that plumbing from aquarium to Deluxe EcoSystem Miracle Mud® Filter allows for enough water to go into the filter at a rate sufficient to match the rate of water pumped out of the EcoSystem Miracle Mud® Filter and back into the aquarium.

B Filter → pump (external pump only)

Connect Chamber 4 of filter to appropriate pump. Use bulkhead (black part - inside filter) to attach PVC pipe to filter. Use union ball valve to connect PVC pipe to pump (allows easy replacement of pump).

- * **If submersible pump is used - NO plumbing is needed. Plug up bulkhead in Chamber 4.**



SET UP PROCEDURES EXISTING AQUARIUM – Pg. 18

DELUXE ECOSYSTEM MIRACLE MUD® FILTER

The process of successfully adding a Deluxe EcoSystem Miracle Mud® Filter to your **existing aquarium** is as follows:

- Follow steps 1 – 9 of Deluxe EcoSystem Miracle Mud® Filter setup in new aquarium (pgs. 11 – 13).
- **Allow existing filter to continue running** with the Deluxe EcoSystem Miracle Mud® Filter for that cycling period of **4-6 weeks**. After that cycling period, reduce the use of the existing filter by turning it off for 2 hours per day initially*. Increase this shut off time of your old existing filter during the next 2 weeks. After this 2 week period, you can completely turn off your old existing filter and run your Deluxe EcoSystem Miracle Mud® Filter independently. By gradually taking the existing filter off your tank – you will reduce the amount of shock that fish, corals and plants experience during this change.

* If your existing filter does not allow you to turn it completely off for period of hours – proceed to turning it off after 8 weeks of cycling the Deluxe EcoSystem Miracle Mud® Filter.

IMPORTANT – In the event that you CANNOT allow your existing filter to remain running while your Deluxe EcoSystem Miracle Mud® Filter is cycling – it is possible to take off your existing filter however outbreak of nuisance algae, imbalance and in some cases – death to some fish, coral or plant may result.

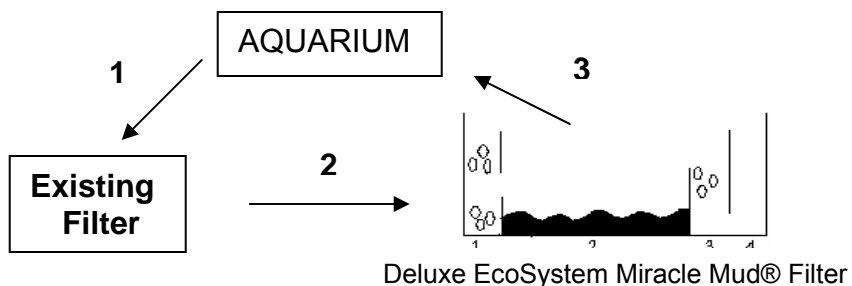
SUBSTRATE LEVEL OF EXISTING AQUARIUM

If you have an existing tank that has more than 1" (2.54cm) of substrate – you will need to get rid of excess amount. Contact EcoSystem Aquarium for detailed instructions.

The set up of a Deluxe EcoSystem Miracle Mud® Filter to an existing aquarium (a tank that already has livestock) is slightly different from the set up for a new aquarium. This is because of the fact that the Miracle Mud® still needs to be properly cycled before it can be allowed to support / filter the tank. However as the tank already has fish, corals, plants and/or other animals, there needs to be another filter (the best being the existing filter) that will be temporarily used during this cycling time. The following instructions should be followed to the best of one's abilities and allowance in order to ensure a successful conversion to the EcoSystem Miracle Mud® Filter.

PLUMBING SETUP- With an existing aquarium you may have to plumb your EcoSystem Miracle Mud® Filter “temporarily” * in order to allow water from the tank to flow through the existing filter then through the EcoSystem Miracle Mud® Filter and finally flow back into the aquarium.

Diagram 4 – Temporary Plumbing



Plumb from (1) aquarium to existing filter, (2) existing filter to EcoSystem and (3) EcoSystem to aquarium. Afterwards the EcoSystem Miracle Mud® Filter should be plumbed directly to your aquarium as designated in plumbing setup (pg. 7-10).

* The use of a hang-on protein skimmer will eliminate this temporary plumbing setup.

C Pump → Aquarium

- External Pump
--- Connect appropriate pump to aquarium via PVC pipes with a union ball valve near pump.
- Submersible Pump
--- Connect appropriate pump to aquarium via plumbing (plastic hose or PVC pipes).

UV sterilizer is a recommended component that can be placed between the pump and aquarium to reduce risk of parasites.

D Back-up flow (OPTIONAL)

With a T-tube valve make a “back-up flow” plumbing that will return excess water to Chamber 1 of the filter . This is recommended to control water flow (i.e. when using a pump that outputs more water than the aquarium can handle).

IMPORTANT – Completely assemble all of your plumbing BEFORE using any PVC glue to permanently bond/seal the PVC joints. This will enable you to make any corrections - if needed, prior to the final EcoSystem Miracle Mud® Filter plumbing setup.



**SET UP PROCEDURES
NEW AQUARIUM
EcoSystem Miracle Mud® Filter – Pg. 11**

SET UP PROCEDURES FOR NEW AQUARIUMS – If you have an existing aquarium please proceed to setup instructions on pgs. 17 – 18.

*The following directions are to **CYCLE & MATURE** the Miracle Mud® - allowing the proper bacteria to colonize the Miracle Mud® bed and enabling it to be an efficient filter. This is very important to the setup of the Deluxe EcoSystem Miracle Mud® Filter – and should be closely followed. Not following these steps may adversely affect your EcoSystem filter.*

1. Place bioballs or live rock into Chamber 1 and 3 (make sure that Chamber 3 is filled completely – Chamber 1 should be partially filled with bioballs or live rock). Place Pre-filter 200 micron bag in Chamber 1.
2. Pour the Miracle Mud® substrate into Chamber 2 and level it evenly to create a 1 inch (2.54 cm) thick layer.
3. In order to prevent the Miracle Mud® from being stirred up, place the Miracle Mud® BAG on top of the Miracle Mud® bed. Gently pour water (**pre-mixed*** salt for a marine aquarium and fresh water for a fresh water aquarium) onto the Miracle Mud® bag. Continue filling up Chamber 2 with the appropriate water until it begins to flow into Chambers 1, 3 and 4. Stop filling with water when the height of the water level in Chambers 1 and 2 are the same as the height of the divider in Chamber 2. (More water may be added –if needed when pump(s) are turn on.) Remove the Miracle Mud® bag.
*** Never add salt directly into tank – always premix saltwater and allow to stand for 24 hrs. before use.**
4. Allow the Miracle Mud® bed and all particulates to settle and water to clear before proceeding any further (~ 1 hour but may take longer in certain cases). Remove any floating debris in the water with a net or paper towel.



**SET UP PROCEDURES
NEW AQUARIUM
Livestock – Pg. 16**

REEF TANK (continue)

4. **After 4 weeks** of cycling your Deluxe EcoSystem Miracle Mud® Filter, check your aquarium tank water quality. If it is within the specified range (refer to Table 5 on pg. 14), you can gradually introduce corals that are recommended by your dealer. Please do not add more than two corals each time, allow the current corals to acclimate in your aquarium tank before adding more corals.
5. **After 6 weeks**, check the water quality (refer to Table 5 on pg. 14) of your aquarium tank before adding any fish.
6. Gradually introduce **quarantined*** fish, placing one fish at time into your aquarium tank. Test your aquarium tank for ammonia daily, the level should be zero before you add more compatible fish into your aquarium tank.

TROPICAL FISH / FRESHWATER TANK

1. **After 3-4 weeks** of cycling your Deluxe EcoSystem Miracle Mud® Filter, check the water quality (refer to Table 5 on pg. 14) of your aquarium tank before adding any fish and/or plants.
2. Add appropriate plants into your tank. Gradually introduce **quarantined*** fish, placing one fish at a time into your aquarium tank. Test your aquarium tank for ammonia daily, level should be zero before you add more compatible fish into aquarium tank.

*** Fish should be quarantined in a separate tank for at least 2 weeks. This is a preventive measure.**



SET UP PROCEDURES NEW AQUARIUM Livestock – Pg. 15

FISH ONLY TANK (Marine)

1. **After 6 weeks** of cycling your Deluxe EcoSystem Miracle Mud® Filter, check the water quality (refer to Table 5 on pg. 14) of your aquarium tank before adding any fish.
2. Gradually introduce **quarantined*** fish, placing one fish at time into your aquarium tank. Test your aquarium tank for ammonia daily, the level should be zero before you add more compatible fish into your aquarium tank.**

* Fish should be quarantined in a separate tank for at least 2 weeks. This is a preventive measure.

** Your local dealer will also be able to recommend the appropriate amount and types of fish for your aquarium.

REEF TANK

1. **After 2-3 weeks** of initially cycling your Deluxe EcoSystem Miracle Mud® Filter, check the water quality (refer to Table 5 on pg. 14) of your aquarium tank.
2. You can introduce sea urchins, astrea snails and herbivorous fish into your aquarium tank at this stage of cycling your aquarium tank.
3. Set up high intensity lighting above your main aquarium. This lighting should be used for 10 – 12 hours per day for your aquarium. Consult your local dealer for aquarium lighting requirements appropriate for your corals. **DO NOT** turn on until there are corals in your tank.

Recommended Additional Reference / Guide Book:
Michael S. Paletta – The New Marine Aquarium
(Microcosm Publications)



SET UP PROCEDURES NEW AQUARIUM EcoSystem Miracle Mud® Filter – Pg. 12

5. Securely place the Power Compact light fixture over Chamber 2. (Peel brown paper backing of plastic cover before use) Do not turn the light on – leave the light OFF for the time being.

Safety Note:

DO NOT allow any contact to occur between the Power Compact light fixture and any water.

6. Switch on the pump assigned to Chamber 4 and initiate water flow from aquarium to the Deluxe EcoSystem Miracle Mud® Filter. Allow the Deluxe EcoSystem Miracle Mud® Filter to run continuously for 3 days **WITHOUT** any fish, corals, or plants in your aquarium tank. After this initial 3 days set up, you can start to cycle your tank by adding some hardy fish into your aquarium (i.e. yellow tang, damsels). Consult your local fish store for possible suggestions.
7. After 1 week of cycling your tank, place **cured live rocks** into aquarium. **DO NOT** switch on the aquarium lights during this period of filter preparation.
 - Cured live rocks are live rocks that have been cycling in your dealer's tanks for a minimum period of 6 weeks. Using uncured live rock is **NOT** recommended as it will cause persistent nuisance algae and phosphate problem.
8. If you plan to have substrate (live sand, crush corals, aragonite) in your main tank – please place cured live rock directly onto the aquarium bottom and distribute substrate bed around live rock.
 - Substrate bed must be only **1" (2.54cm) OR LESS** in depth. Having a deeper substrate bed will compromise the aquatic condition of your aquarium (refer to Q&A section on substrate, pg. 21 for details)



9. After 2 weeks of cycling your tank, obtain 10 – 20 strands of macro algae plants/plant (please see local fish store)

Table 4 – Recommended Vegetation

SETUPS	VEGETATION
Marine / Saltwater	Caulerpa (any species), Sea Grass, any type of hardy marine vegetation
Tropical / Freshwater	Stem/bunch & fast growing. Wisteria (Hygrophilia difformis), Rotala indica, Ludwigia repens, Hydrilla

Tie root strands to small pieces of rock with fishing line. Gently push the rock with the macro algae/plants into the Miracle Mud® bed in Chamber 2 making sure to plant the vegetation into the Miracle Mud® bed. Distribute the macro algae/plant evenly throughout the Miracle Mud® bed to ensure a higher probability of survival. (Refer to Q&A Section, pg. 22 for help)

Switch on the Power Compact light fixture for Chamber 2 and leave it on permanently for 24 hours.

10. Maintain this cycling period for a period of at least **4 – 6 weeks** before introducing any livestock.

The more time that the Deluxe EcoSystem Miracle Mud® Filter is allowed to mature – the better it is for the Miracle Mud®.



ALWAYS CHECK WATER QUALITY before adding fish, coral, plant or any animals to your tank – making sure that the water condition is within the following parameters.

Table 5 – Water Quality Chart

	FISH ONLY TANK	REEF TANK	FRESHWATER TANK
pH	8.0 – 8.5	8.0 – 8.5	7.0
Specific Gravity	1.015 – 1.023	1.020 – 1.023	N/A
Temperature	78 – 82 ° F 25.5 – 27.7°C	74 – 78 ° F 23..3 – 25.5°C	80 – 84 ° F 26.6 – 28.8°C
Ammonia	~ 0 PPM	~ 0 PPM	~ 0 PPM
Nitrite	~ 0 PPM	~ 0 PPM	~ 0 PPM
Nitrate	~ 0 PPM	~ 0 PPM	~ 0 PPM
Phosphate	0.01 – 0.03 PPM	0.01 – 0.03 PPM	0.01 – 0.03 PPM

° F = degrees Fahrenheit

° C = degrees Celsius

PPM = Parts Per Million

You can test your water with test kits or have your local dealers test a sample of your tank water.