

# MINIATURE REEF AQUARIUMS IN YOUR OWN HOME

**T**o maintain a marine aquarium is not as impossible as many people have been led to believe. Technology has made it much easier to keep corals, marine algae and fish alive and healthy. If certain criteria are met, you could expect to achieve the same results as in nature. To maintain the aquarium there are two types of filtration systems to consider.

The first being conventional filtration methods such as canister or internal power filters, the second being trickle filters. Trickle filter systems have become popular in recent years and are considered to be "state of the art" in terms of achieving optimum water quality. Once established, you would be required to spend

approximately half an hour per week in maintaining your miniature reef.

A standard aquarium would suit as a miniature reef, but a wider aquarium allows more surface area to build your reef. If a deeper aquarium is used more light will be needed as it doesn't penetrate as well. We would recommend not to set up an aquarium that is too small as it makes it harder to maintain water quality. When all the live rock is added to an aquarium of any size water is displaced. A standard 48" aquarium may hold 200 litres, this will be reduced to approximately 140 litres when 3 boxes of living rock are added.

One box of living rock weighs approximately 20kg, keep-

ing this in mind a sturdy stand is needed to support all this weight. Open magazine rack type stands, or full cupboard and hood type stands, are available. If a full hood is used allowances must be made to help reduce heat build up from the lights. This can be achieved by using some form of venting or fan.

The major problem with marine aquariums is to maintain the water stability. Waste products from fish, corals and invertebrates are continually building up in the aquarium. If these products are not broken down or removed the inhabitants will suffer. To overcome this problem good filtration is essential. A Mini Reef aquarium should have at least 5 times water turn over per hour.



Many varieties of coral may be kept in a Miniature Reef

### *Canister and internal power filters*

Canister and internal power filters are motorized and extremely useful in removing solid waste material from the aquarium water. Eheim canister and internal filter are ideal power filters as they have ceramic shafts and the motor being set into resin is not effected by salt water. It would be best if the canister filter was the correct size as to provide suitable water turnover, then the internal filter can be used primarily to provide extra water movement for the corals etc. On the intake a surface extractor can be installed as this removes any floating debris, and double taps make removing and cleaning easier. If the power to the canister filter is off for a few hours, the contents of the filter is likely to become toxic (due to lack of oxygen). In this case, filter material must be thoroughly washed or replaced before starting the filter again.

### *Trickle filters*

The trickle filter is the best form of filtration because the amount of dissolved oxygen in the water is much higher. The action of the water raining or trickling over the bio medium dissolves more oxygen into the water and also creates larger colonies of bacteria producing impeccable water qualities. The design of the trickle filter allows you to place a heater into the sump area providing a safe and out of site place for this piece of equipment. Thermometers, pH probes and hydrometers can also be placed into the sump of the trickle filter. Another advantage with this form of filtration is if the power has been off for a few hours, unlike canister filters, the dissolved oxygen in this filter keeps the colonies of

bacteria alive, thus avoiding the task of having to clean the filter.

### *Protein Skimmers*

Protein Skimmers remove excess proteins and some heavy metals. Bubbling a fine stream of air through a narrow "reactor tube" causes dissolved organic waste to rise to the surface in the form of foam. This foam is then collected and disposed of, via a cup at the top of the protein skimmer. The skimmer helps to provide oxygen improves the clarity and chemical quality of the marine aquarium. The protein skimmer is powered by either a double outlet or a larger single outlet air pump.

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## *...Your Minature Reef display can look just like a slice of the Great Barrier Reef.*

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### *Heating*

Heating is accomplished by a submersible heater and is monitored with a thermometer. Tropical marine fish are best kept at a temperature of 25°C, with a range of 24°C to 28°C being acceptable.

### *Lighting*

Lighting in the marine aquarium is extremely important, as many of the corals and anemones have algae living within them. This algae needs intense light to allow them to photosynthesis and therefore survive. At least four fluorescent tubes are needed to provide a light similar to natural sunlight. There are many different types of light tubes available for marine aquari-

ums, and it is important that one should be actinic (blue). The lights should be on for approximately 10 hours a day.

### *The Water*

The Salt water is best if tap water is mixed with a synthetic salt as this is much cleaner and free of parasites. Store salt-water in containers for a week as this allows the salt to dissolve, water to age and warm to room temperature. It is best if a 10% water change is done each month to remove nitrates which build up.

Trace elements & fertilizers can be added, and if necessary pH buffers, as corals, invertebrates and algae's use these to grow.

Water quality is monitored with several different test kits. A Hydrometer for the specific gravity (amount of salt in the water), a high range pH test, an Ammonia test (NH<sub>4</sub>), Nitrite test (NO<sub>2</sub>), Nitrate test (NO<sub>3</sub>), and Carbonate Hardness test (KH).

The first 2 months are the most critical when setting up a marine aquarium. During this period problems with ammonia and nitrite build up can occur. This is caused by the fact that there is no bacteria in the filtering systems to breakdown the wastes. To help overcome this problem we used a freeze dried bacteria, which helps to get the biological cycle started. This can be added about 2 days before you add any rock to the aquarium and continuing every 3 days for the first 2 months.

When the aquarium has been filled and filters have been running for about 1 week, you can add 1 box of the live

rock. After this has been added the water quality must be monitored closely, as the many living creatures on and in the rock will cause ammonia levels to rise. A partial water change, of up to 25%, should be done about 3 days later to help reduce ammonia levels. If the aquarium becomes cloudy or smells this is a sure sign that ammonia is present and more water changes are needed. When ammonia levels are nil and nitrite levels have started to fall another box can be added. This process can be repeated until you have

achieved the desired effect.

When stocking the aquarium once the aquarium has stabilized fish can be added. These should also be added slowly, so that the bacteria living in the filters, has time to multiply and cope with the extra wastes. The many types of algae that grow, can appear from spores that were on the rocks when put in. Other forms of algae called caulerpa are more plant like, this can be purchased and added to the aquarium at any time. One important thing to consider when stocking the

aquarium is what type of fish you want in your system. Some of the Angelfish and Butterflies can eat invertebrates and pick at anemones, so care must be taken to ensure that only 'reef friendly' fishes are added to coral aquariums.

A display can take approximately 2 years to establish properly, so be patient, it takes time to get things looking just right. Given the time your miniature reef display can look just like a slice of the Great Barrier Reef.

## **TROPICAL MARINE FISH : WATER RECOMMENDATIONS**

	IDEAL	MIN	MAX
TEMPERATURE	25oC	22oC	29oC
SPECIFIC GRAVITY	1.020	1.019	1.025
pH	8.2	7.8	8.4
AMMONIA	NIL	0	.5mg/l
NITRITE	NIL	0	.10mg/l
NITRATE	NIL	.27mg/l	.5mg/l



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