

# FRESH WATER ORNAMENTAL FISH CULTURE

## Introduction

An aquarium is a glass-sided tank, or bowl, in which fish or other living aquatic animals or plants are kept for recreation. Fabrication of an aquarium is not a difficult task and also it does not require any sophisticated equipment, large investment or intensive labour.



## Factors to be considered for tank construction

- Size of the tank
- Shape
- Number of fishes
- Area – No direct exposure to sunlight

## Size

Since there is no scope for changing the dimension of aquarium after construction After constructing no option to change its dimension

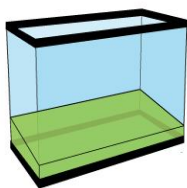
## Factors

- Number of fishes to be kept- governed by surface area of the tank(L\*B), Larger the area less stress to the fishes, thumb rule – 75cm<sup>2</sup> for 2.5cm of fish excluding tail
- Nature of aquascaping
- Capacity to invest money
- Space available
- Size of fish introduced
- Always better to opt large tank
- Small tanks water quality parameters will fluctuates
- The ideal ratio of length to height of aquarium tank is 3:2
- The minimum reasonable size of an aquarium tank is 60cm length, 30cm height and 30cm width

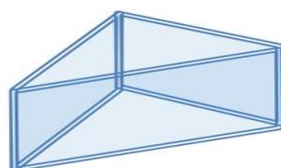
### Standard dimensions for rectangular tanks

Length	Breadth	Height	Capacity	Glass thickness
60	30	30	54	4
90	30	38	103	5
120	30	45	162	6
150	45	60	405	10
180	45	60	486	12

### Shape



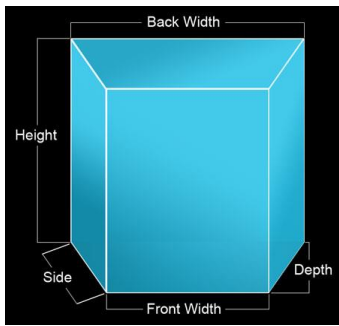
**Rectangular**



**Triangular**



**Square**



**Trapezoid**



**Global**



**Hexagonal**

## Accessories

### 1. Glass

- Glass panels of required size are cut and cleaned- 4 side panels and 1 base panel

### 2. Cleaning purpose

- Carbon tetrachloride, acetone or degreasing agents

### 3. Sealing – Silicon sealant

### 4. Aquarium lamps

- a) Light is a stimuli for plant growth (photosynthesis). Atleast 10-12hr of light period is needed. The most popular- fluorescent lamp and compact fluorescent lamp- gives a cool and effective illumination
- b) Imported aquarium lamps(Gro-lux)- enhance the color of fishes
- c) For a 48inch\*18\*12 inch tank, 25W fluorescent white tube is suitable, which would be placed above the water surface leaving a gap 4-6 inch
- d) Lamp always fitted in the hood – so no shade falls on the viewing side
- e) Necessary to give a ventilation to minimize the buildup of heat in the aquarium

### 5. Hood

- Improves the aesthetic beauty of the unit
- Protect the fishes and prevents insects, dust falling into the tank, Evaporative loss is prevented
- Provides base to which light arrangements, aerator can be fitted
- A window is provided in the hood to feed the fishes daily
- Plywood, bamboo ply and wood-ideal materials



## 6. Stand

- Must be strong enough to support the weight of full tank-gravel, water and accessories



Iron



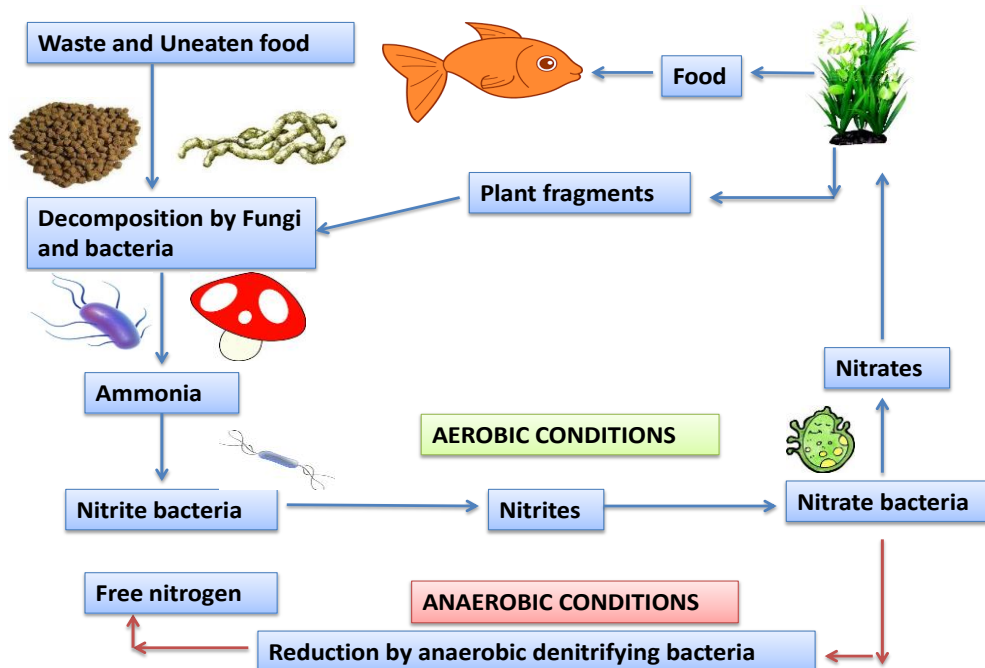
Wood



Steel

## 7. Filters

- Ammonia- highly toxic to fishes- accumulates in water –excretion of fishes, decomposition of faeces, left over feeds and organic matter.



- Filters – mechanical, chemical, biological- maintaining the water quality
- **Mechanical**- water passes through a filtration material like filter floss, foam material,
- **Chemical** – activated charcoal
- **Biological filters**- water passed through a filter bed, and bacteria convert toxic ammonia to less toxic nitrates
- Most commonly used – under gravel biological filters contains a corrugated or indented plastic sheet perforated with fine holes having a vertical pipe at the rear corner

- Gravel of 3-4mm size spread to height of 5cm over the plate
- By means of air pump a column of water moves up the pipe, creates a water recirculation through sand bed
- Downward movement of water through sand bed traps suspended particles
- Efficiency of biofilter can improved by using powerhead
- Power filter- internal filter consists of filter unit attached to powerhead, serves function of biological and mechanical filter
- Bioballs increase the surface area

## FILTER PHOTO

### 8. Aerators

- Increase the oxygen content and removes excess carbon dioxide
- Vibrator type is the cheapest and most commonly used
- Aerator must be kept above the water level in order to prevent back sucking of water if the power supply fails
- Air is supplied to aquarium through PVC tubings, airline dividers, flow regulating valves and airstones

### 9. Heaters

Tropical Freshwater fishes are warm water fish. These fish cannot survive in cold waters. They require an optimum water temperature of 26-28C. Thus heating of the aquarium is required in winter.

### 10. Gravel

Gravel is required in an aquarium to provide natural look, hold rooted natural aquatic plants and most importantly it acts as a substrate for proliferation of useful bacteria.



### 11. Aquarium plants

**Aquatic plants are used to give the freshwater aquarium**

- Natural appearance,
- Oxygenate the water
- Provide shelter
- Spawning
- Food

#### **Types of aquatic plants**

- Surface floating-azolla, lemna, eichhornia, salvinia and pistia
- Emergent plants- water lilies



- Rootless submerged- ceratophyllum, nitella
- Rooted submerged- vallisneria, hydrilla, limnophila, najas, myriophyllum



**Salvinia**



**Ceratophyllum**

## 12. Decoratives

Background posters, various types of toys, rocks and caves, shells and corals drift wood etc. Are used to decorate aquariums.



**Aquarium posters**



**caves**



**shells**

## Steps for fabrication of rectangular aquarium

- Select the glass panes, cut them into required sizes, using a glasscutter and a scale.
- Clean all of the edges of glass with acetone or alcohol.
- Spread polythene or old newspaper sheet on the surface of the selected place.
- Place one of the glass panes on a plain surface.
- First, raise the back panel by applying silicon sealant; follow the same process for other side glasses too.
- Tape all the corners from outside to give extra support during setting.
- Smoothen the sealant at the joints with the finger.
- Leave the sealant to get hardened atleast for a day.
- When the tank sets remove the extra sealant, if any with a sharp knife or a blade.
- Finally check the aquarium for any leakages.
- Acetic acid is released from settings so tank should be thoroughly washed.

## Setting up

- Install the tank on a stand with thermocoal cushion

- Biological filter assembly is arranged on bottom of the tank and sand is spread over the plate
- Aquascaping
- After filling  $\frac{3}{4}$  arrange with plants
- Then completely fill the tanks leaving 5cm at the top
- Keep the tanks with biofilter operation for 10-30days
- Introduce only compatible species
- Introduce fishes after giving a quarantine period

## Maintenance

- Temp, pH, hardness, DO, CO<sub>2</sub>, ammonia, nitrite, nitrate within optimum
- Weekly exchange 10-20% of water
- Siphoned the bottom water
- Slope the bottom gravel –accumulate the wastes at the lowest level
- Tap water – must be kept open for two days
- Introduce scavenger fishes like sucker cat fish  
e.g.- loaches, corydor
- Fed twice daily in morning and evening
- The quantity of feed will be consumed in 10-15 minutes alone should be given