O.R.B.S

(Oxygen reactive biological spheres)

One of the most important aspects of keeping a successful Koi pond is biological filtration. Orbs are a new generation of filter media specifically designed for the aquatic industry and are not bi-products from other industries.

New Pond Syndrome

No doubt you may have heard of this term before, they should really be named IBF's (Immature Biological filters). This period is when colonisation of the media is taking place. Toxic levels of ammonia and nitrite are not being converted fast enough into less toxic nitrate. IBF's can and do cause fish health problems.

Toxic ammonia can cause extensive tissue damage both to the gills and kidneys. High ammonia levels will also inhibit the immune system leaving koi vulnerable to disease and death. IBF's also result in high nitrite levels, which reduce the amount of oxygen absorbed by red blood cells, this causes a condition called methemoglobinemia, more commonly known as (brown blood disease). The Hemaglobin in red blood cells is converted to methemoglobin causing hypoxia and eventual death. The addition of sodium chloride ions (salt) will inhibit the uptake of methemoglobin reducing its toxicity. IBF's come to maturity when nitrogenous waste is converted to nitrate. This is accomplished by the nitrifying bacteria Nitrosomonas and Nitrobacter; this is also more commonly referred to as the (Nitrogen Cycle).

Surface Area

Orbs have a massive biological surface area and are up to 80% more efficient than other leading biological media. Also unlike other media the surface is grainy not smooth, this grainy surface is ideal for the nitrifying bacteria's nitrosomonas and nitrobacter to secrete their sticky slime matrix. Once colonised the dense bio-film is more resistant to cleaning which in turn accelerates the biological process.

ORBS TECHNICAL DATA

Orbs: diameter 12mm *(max diameter 13mm)*
Number per ft: *12x25 4/13* = 24
Number per ft³: *24x24x24* = 13824
Surface area: 697.87mm³
Surface area per ft³: 589in³

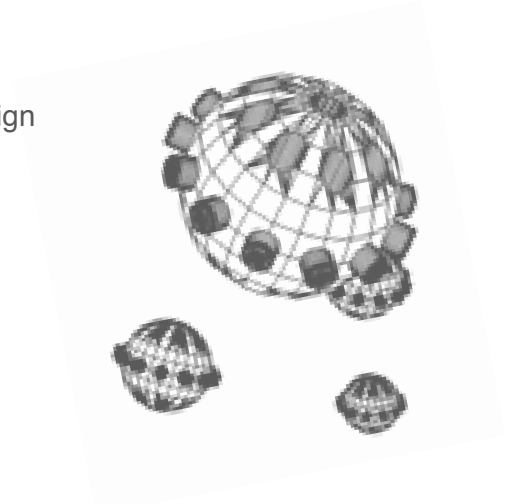
Orbs: diameter 7mm *(max diameter 8mm)*
Number per ft: *12x25 4/9* = 34
Number per ft: *34x34x34* = 39304
Surface area: 424.34mm³
Surface area per ft³: 1018in³

Void Space

Compacted media such as beads and similar types are excellent at trapping solids. They give good water clarity but fail to achieve full biological capability. Put simply, most compacted media do not have void spaces and water is inhibited from flowing freely around the surface area. Most commercial media are by-products from other industries. These by-products have large surface areas and have been adapted for use in biological filters; unfortunately they seldom have void space and once compacted the surface area is significantly reduced.

Orbs unique design overcomes this with EVP's (External Void Protectors). Encompassing the Orbs, EVP's never allow the spheres to totally compact, allowing water to flow freely around the surface area.

Durability



Orbs have been designed with durability in mind and the unique design has internal and external protection. The internal surface area is protected from being crushed by specially designed cavities. Having multiple cavities instead of one gives the sphere its integral strength. The outside surface area is well protected by the EVP's. Unlike other dual surface media or open cell media. Orbs strength provides structural integrity against the crushing effects of being compacted. This structural integrity ensures the spheres maintain maximum productivity while colonising nitrifying bacteria.

Mechanical and Biological

Mechanical & biological filtration is really one and the same unless a completely separate filter is used for both; also the mechanical filter would need to be anaerobic (without oxygen) and could not be classed as biological. Most mechanical filters are attached to a main filter in some fashion or another and if they are fed by oxygenated pond water they will provide aerobic (with oxygen) conditions for nitrifying bacteria to colonise. Orbs are designed for biological filtration but are extremely efficient at solids removal.

Orbs come in two sizes 12mm & 8mm. The large Orbs (12mm) are used for both solids removal and as a first and second biological stage. Regular cleaning of the first bio-reactor will ensure the removal of most of the solids above 80 microns. The Smaller Orbs (8mm) are designed for The-Qube 200 and 300 units to give a large surface area in a small filter. The smaller Orbs once colonised will develop a much denser stronger bio film. The second bio-reactor also provides exceptionable water quality and clarity. Orbs intercept particles between 30 and 80 microns by colliding with the surface area. These collisions increase particle sizes and are more easily removed. Particles below 30 microns are also removed by a process called bio absorption. This is where particles are removed by the biofilm itself, although this process happens at a much slower rate.

The whole process will leave you with crystal clear water. Regular cleaning of the second bio-reactor is also encouraged and because Orbs surface area is well protected very little biomass can be lost. Orbs media is not meant to have direct aeration and air stones should not be placed under the media. Orbs can be used in any filter unit but was specifically designed for a new generation of filters, called The Qube.

Cleaning

Cleaning Orbs could not be simpler; In fact any filter bay can be retro-fitted with an air cleaning system. To clean Orbs turn off the water flow, turn on your air pump and orbs will bubble and rotate, this releases any detritus from the media which can then be flushed to waste. If you don't have an air cleaning system you can simply agitate the media which again releases any detritus, once you have flushed to waste rinse the media with pond water until the water runs clear.

Chemical

Orbs are totally inert making them chemically resistant and are green in colour. Once the orbs have become colonised the nitrifying bacteria is protected inside the sphere, making the bio-film very productive.

WHY USE ORBS?

Unique design
Massive surface area
Superb water clarity
Easy cleaning
Low maintenance
Cost effective
Protected surface area
Chemically inert
Durability
Specific media (not adapted)
Enviromentally friendly
Eliminates smells