

Air Diffusers

the best fine bubble aeration system



Applications

- Waste water treatment
- Activated sludge aeration
- Thermal destratification of reservoirs
- Aquaculture & public aquaria

Description

The Aqua diffusers are among the most robust and versatile fine bubble diffusers commercially available. We have been manufacturing the diffusers for 20 years and are one of the leading air diffuser manufacturers in Europe.

Fine bubble diffusion is inherently more effective than coarse bubble diffusion in providing a greater mixing action and aeration efficiency. We are not aware of any other fine bubble diffuser that can compare with the performance of the diffuser.

The diffusers are of semi-flexible construction 32mm in diameter and of variable length up to 5 metres depending on the air, oxygen or carbon dioxide through-put required. The diffusers have their own ballast and will stay on the bottom of the aeration tank without the need to add additional ballast or to secure them to the base.

Construction

The diffusers are manufactured from a very heavy duty polyester fabric tube, a nylon distributor hose runs down the centre of the tube. Between the nylon hose and polyester tube there is ballast comprising of spherical glass beads.

The diffuser is banded using 316 stainless steel (covered in blue sheath) compressed on to the nylon inner tube with a nitrile rubber bush. The metal end fittings are 316 stainless steel. As standard each diffuser is fitted with a 1/2" acetyl plastic hose tail for connection of the diffuser to 1/2" flexible hose. The plastic hose tail is screwed into the stainless steel fitting on the end of diffuser.

Stainless steel, or brass hose tails are also available. A NRV, (non return valve) can fitted into the diffusers, product code 6.2.10 has an NRV as standard.



Cleaning

Solid diffusers have problems with carbonate and iron deposition which blocks the diffusers. Solid diffusers are therefore very difficult to clean and maintain. Flexible membrane diffusers stay largely free of fouling, however they need a heavy frame or are anchored to the base of the aeration tank, this makes the diffusers much more expensive and difficult to handle, it also makes them difficult to use in lagoons, or in retrofitting systems.

The Aqua diffuser is a hybrid unit, because it is semi flexible, carbonates and metal oxides simply crack off the unit. Also because our diffuser has its own internal ballast it does not need to be anchored to the base of the tank. If any cleaning or maintenance is required, the diffuser is simply pulled out of the tank using the air hose. The tank can be full of water and the air blowers running when the diffuser is removed.

Life of diffuser

Normal operating life is from 5 to 10 years

Installation notes

The diffusers require an air blower or compressor, to drive the system. The air pressure required depends upon the depth of the water, in most situations the blower should be sized to give up to 1 bar air pressure with water depths up to 5m. Positive displacement 100% oil free blowers are best, such as a diaphragm or linear compressors, rotary vanes, or rotary lobe compressors. If the water is over 5m depth, claw compressors should be used, and for the highest pressure screw compressors are appropriate.

The compressor or air blower should be located adjacent to the air diffusers. However you could locate the compressor many 1000's of meters from the diffusers if the pipe work is sized accordingly. The pipe work should be in metal, if plastic pipe is used, then the first 6 meters of pipe work should be metal in order to bring the air temperature down to at least 90 degC in the plastic pipe. In lakes and lagoons, make an air ring main and come off the ring main with ½" flexible hose, fit a diffuser on the end of the hose, and then simply drop the diffuser into the tank. Installation is therefore simple and very quick.

Oxygen Transfer performance

Air diffusers details					Typical amount of oxygen transferred per diffuser			
Diffusers length (m)	code	diameter	weight Approx Kg	air flow cubm/hr (+/- 20%)	Aquaculture & environmental applications		Waste water treatment and Activated sludge	
					1.5m@20degc@60%sat in Kg/hr	3m@20degc@20%sat in Kg/hr	kg/hr	kg/day
0.33	6.2.1	32mm	0.5	1	0.015	0.36	0.06	1.44
0.66	6.2.2	32mm	1.0	2	0.03	0.72	0.12	2.88
1.00	6.2.3	32mm	1.5	3	0.045	1.08	0.18	4.32
1.33	6.2.4	32mm	2.0	4	0.06	1.44	0.24	9.6
1.66	6.2.5	32mm	2.5	5	0.075	1.80	0.30	7.2
2.00	6.2.6	32mm	3.0	6	0.09	2.16	0.36	8.64
2.33	6.2.7	32mm	3.5	7	0.105	2.52	0.42	10.08
2.66	6.2.8	32mm	4.0	8	0.12	2.88	0.48	11.52
3.00	6.2.9	32mm	4.5	9	0.135	3.24	0.54	12.48
3.00	6.2.10	32mm	4.5	9	0.135	3.24	0.54	12.48
5.00	6.2.15	32mm	7.0	15	0.21	5.04	0.84	20.16

Kg of oxygen dissolved per Kw of energy expended depends on a wide range of parameters, however with an oxygen tension less than 1 mg/l, at a depth of 5m, water temperature of 10 deg C, in an activated sludge system for the treatment of landfill leachate we recorded an oxygen transfer coefficient of 7Kg of oxygen per Kw of energy expended. In most situations the transfer will be between 2 and 5 kg of oxygen per Kw because the system does not waste kinetic energy in throwing the water up into the air.