

ozone

technologies ltd

protecting our environment

innovations in aquaculture



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innovations in aquaculture

Disinfection of raw, make-up and waste water,
for Recirculating Aquaculture Systems (RAS)
flow through systems, aquariums, and hatcheries

- Or Removal or oxidation of Dissolved Organic Compounds (DOC's)
- Or Improved performance of biofilters, conventional filters and sedimentation processes
- Or Removal of fine and colloidal solids through micro-flocculation
- Or Removal of nitrites, and chemical loading oxidation
- Or Increase Dissolved Oxygen (DO) levels in water
- Or Protein skimmers (foam fractionation)
- Or solid waste recovery improvements
- Or Reticulated and wastewater quality improvements
- Or Increase lifespan of and reduced need for conventional filtration
- Or Reduce pathogens and harmful micro-organisms
- Or Reduced power and labour costs through proven process designs
- Or Efficient gas transfer contactors and injection systems
- Or Monitoring, process control, automation and data logging capabilities



enhanced ozone application...

The enhanced contacting process designed by Ozone Technologies Limited has been developed and used extensively in worldwide applications over the past fifteen years. The O3T process when used to our specifications does not form any extraneous byproducts the likes of chlorates and bromates in salt water systems, and therefore creates no risk to either the biological filtration system or the stock itself.

These systems can be easily modified for each clients specifications. Our extensive experience with these unique delivery processes ensures smooth operating and swift returns. In addition, we are able to find effective solutions to common filtration problems. Our clients inform us that our ozone systems would be the last thing they would do without.



Astana aquarium, Kazakstan



Predator Exhibit installation, Reef HQ, GBRMPA, Townsville, Australia. IPS90 units above, ozone plant below. A very small space is required for the equipment.



IPS60 system prior to despatch



turn-key solutions...

We offer peace of mind with a turnkey solution for your aquatic application. Site surveys & consultation services are available, from plant conception or integrating to existing system.

We can offer systems which incorporate all necessary equipment for successful operation, including process control, automation and monitoring as required. Follow up visits with our aquaculture specialist and servicing are available on site or in our service department.

what are the advantages?

Ozone treatment brings many beneficial effects to the water:

- disinfection (including the control of microorganisms, and algae)
- microflocculation
- chemical oxidation

All three occur simultaneously. Careful design of each application is used to emphasize either of the three effects as desired. Consequently, a well designed and operated ozone treatment system can produce high quality, aesthetically pleasing water and provide a healthy environment for the fish and marine animals.

stand alone or integrated

While this can be a stand alone treatment, such as a disinfection system for a single pass flow of water, this treatment can be incorporated into other treatment forms and filtration. It is our experience that this incorporation greatly increases the lifespan of support filtration. Recent developments in wastewater treatment means we can greatly enhance bio-filtration systems also. This system is now used in Antarctica at the Scott Base wastewater treatment plant to recover their water for ablution reuse and ensure any discharged water to the environment is fully disinfected with a high dissolved oxygen content, without colour or odour.

protein skimmers

Ozone Technologies protein skimmers delivers proven strength and reliability in a light-weight cost effective format, with optional clear acrylic towers. These are manufactured on our premises to each specific system requirements. IPS protein skimmers can be trusted to strip high yield waste organics from your aquarium or aquaculture system.

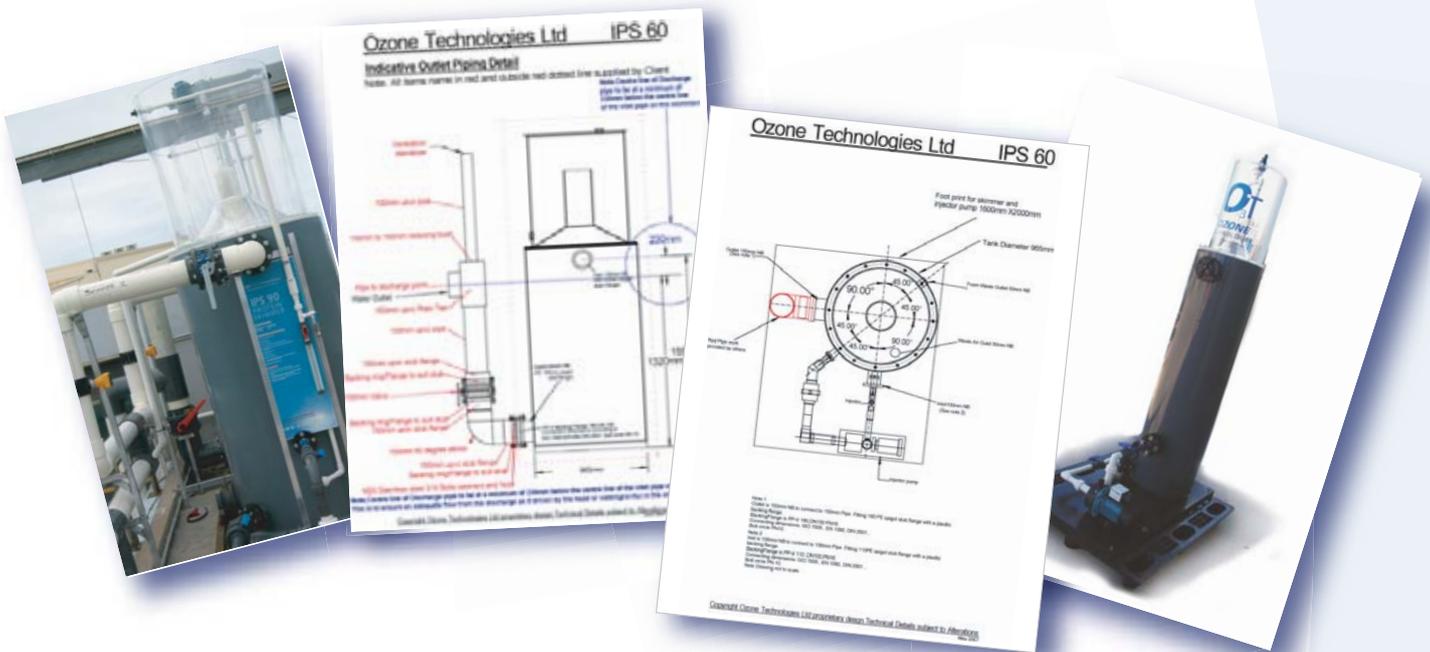
These can be provided in several configurations, depending on requirements:

- Basis units- contactor alone with top cone, flange connections on tank only
- Cone wash-down provision
- Injection manifold, injector, recirculation pump & valves
- Inlet and outlet flow control valves, standpipe & PVC pipe connections
- Flow control equipment for proces water
- Gas mixing manifolds, flow control rotameters, check and pressure valves
- Oxygen, air or ozone generation equipment
- ORP or residual ozone regulated PID process controllers, automation and PLC's.

specifications

Ozone Technologies protein skimmers come in a range of sizes, from ten to one hundred cubic metres per hour. Dimensions are indicative only and may differ from shown.

MODEL	FLOW			DIMENSIONS			CONNECTIONS	
	M ³ /Hr	LPM	L/S	Diameter mm	Base Height mm	Overall Height mm	Outlet mm	Inlet mm
IPS 10	10	167	2.8	440	1570	2280	50	40
IPS 20	20	333	5.6	440	1620	2330	100	75
IPS 40	40	667	11	860	1620	2630	100	80
IPS 60	60	1000	17	950	1700	2700	100	150
IPS 80	80	1333	22	1200	1800	3100	150	130
IPS 90	90	1500	25	1200	2200	3450	200	150
IPS 100	100	1667	28	1200	2200	3300	200	150





Reef HQ GBRMPA - Coral Reef Exhibit

The coral reef exhibit (CRE) at Reef HQ is the world's largest coral reef aquarium at 2.5 million litres. The CRE is unique not only because of its sheer size, but because it is open to the elements. This means the many thousand reef organisms that are housed there receive natural day and moonlight and experience rain and storm events like natural reefs do.

Trying to recreate a coral reef on land – is among the most difficult undertakings because coral are among the most sensitive organisms on this planet. They require extremely high water quality and cannot well tolerate changes in temperature and salinity beyond normal variations. Therefore we are directing a lot of technical effort to control the water quality (protein skimmers, sand filters and ozone), the temperature (chiller system), water motion (wave machine, water circulators), light (shading), salinity (reverse osmosis machine), their food requirements (farming algae, rotifers and Artemia), trace metal supplementation (calcium, strontium) – efforts that are not immediately obvious to Reef HQ visitors.

The protein skimmers at Reef HQ are sized to have a water flow of 25 litres per second. The ozone generators are housed separately in a very cost effective arrangement. In this case, a small garden size shed has been used.

Since implementation of these two systems in 2005, water clarity and quality has improved markedly in the closed system. These two skimmers have replaced the ten previously serving this system, and in addition the sand filters have now been turned off. We've been informed that the coral is thriving, and that rare species that have not spawned in captivity are now spawning repeatedly.

In July 2007 two more 25L/sec protein skimmers with ozone & oxygen feed were installed for the adjoining Predator Exhibit beside the CRE.

Attached are a couple photos for you to see as I thought you may be interested in some muddy foam.... Skimmer 1 (the one near the wall) has been running since Tuesday evening now (~36 hours), and seems to be working very well. Water clarity is definitely improving. Thanks a lot for the huge amount of help you gave us in getting them set up. And definitely let us know when you come towards Queensland again.

....Just a couple photos from the coral tank taken this morning, after 10 days of one skimmer running continuously. The photo may not show it much, but the clarity has greatly improved since when you were here.

*Letter from **Dr Séverine Thomas - Water Quality Officer** ReefHQ, Great Barrier Reef Marine Park Authority*

Emailed reference from Dr Severine Thomas, after first installation in Coral Exhibit:

Sent: Friday, April 07, 2006 4:21 PM

Subject: Comments on our new installation

Since the installation of two IPS90 protein skimmers on our 3 million litres coral microcosm tank at Reef HQ, the inorganic and organic nutrient levels have been reduced, water clarity has improved significantly and coral mortality has been reduced.

The skimmers have been extremely reliable and in general low-maintenance. They have also made it sustainable to put our sand filters off line, which represents a significant saving over the long term by increasing the lifetime of the filters and by reducing the routine maintenance effort (for instance on back-washes).

Ozone Technologies has provided excellent advice to design an adequate solution for our unique coral system. Just as importantly, we have received exceptional technical support during and after installation of the skimmers.

We consider the new IPS90 skimmers to be good value for money and would use this product on other tanks in the future.

Please feel free to refer my and Kirsten Michalek-Wagner's contacts for further enquiries of potential clients.