

WHALE TOOTH™ AERATION



OXYGENATED WATER

Activities ranging from sewage treatment to fish farming, and a few industries in between, are dependent on oxygenated water to support life and biological activity. Well oxygenated water enables more effective, more productive, and more cost-effective operations.

Dissolving oxygen requires energy. The challenge in many instances is that the tanks or ponds being used are shallow, and the traditional methods of oxygenation – diffusers and blowers – are inefficient at shallow depths, whilst surface aerations do just that – aerate only the surface layers.

Clearedge's Whale Tooth™ technology is a unique system which addresses both these problems – efficient aeration at any depth.

HOW IT WORKS

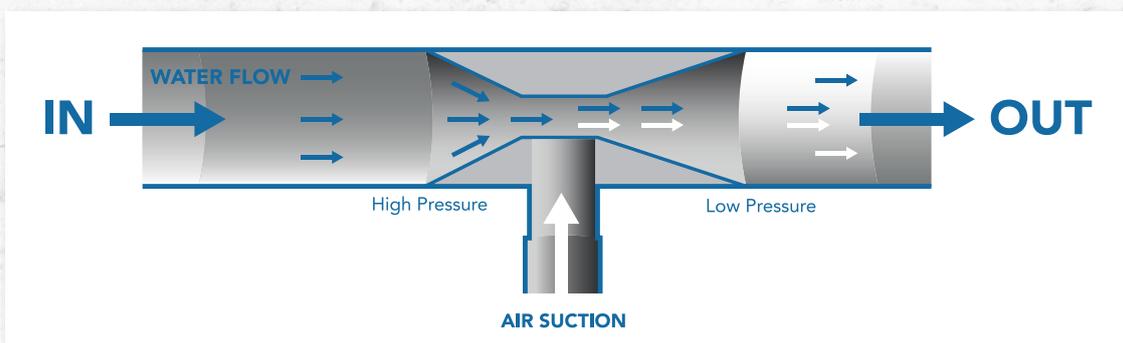
The Whale Tooth™ system utilises a pump, a venturi, and pipes of varying sizes (i.e. non-specialised components) to dissolve oxygen (or any gas) into the liquid. Our configuration has no restrictions or small holes that can clog. In fact the smallest opening below the liquid line is $\text{Ø}50\text{mm}$.

A Whale Tooth™ aerator does not rely on depth for efficiency as the air is dissolved into the liquid *before* it leaves the system. We thus do not require any travel time for the bubbles to ensure efficiency.

Let's take a closer look.

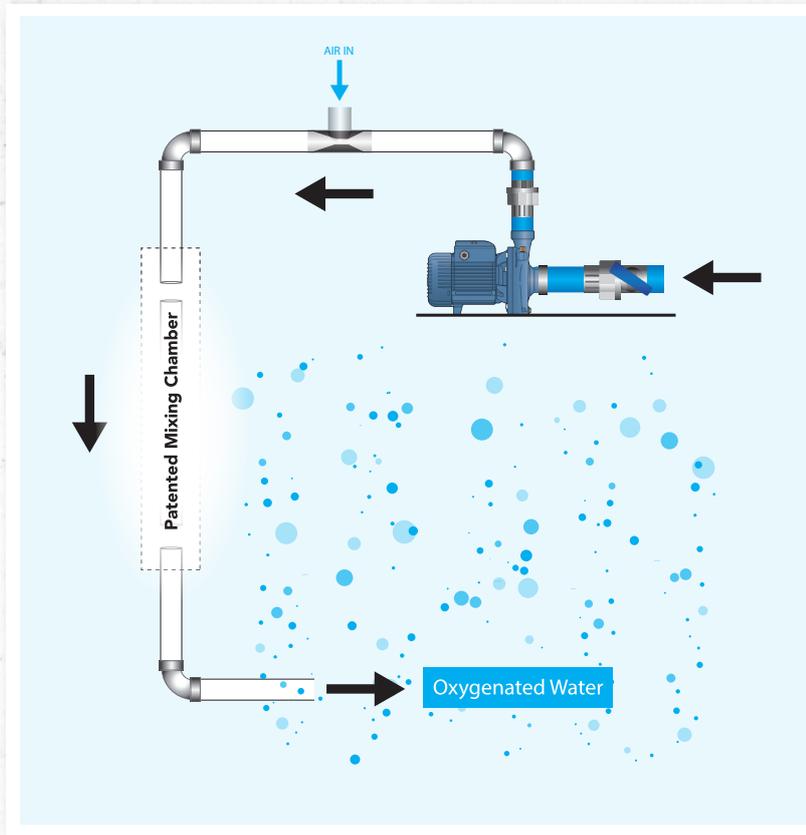
Stage 1 - Primary Mixing

Using Venturi's in aeration is not new, but Venturi's on their own give a low mixing efficiency. Whale Tooth™ uses the Venturi principle in the primary mixing phase:

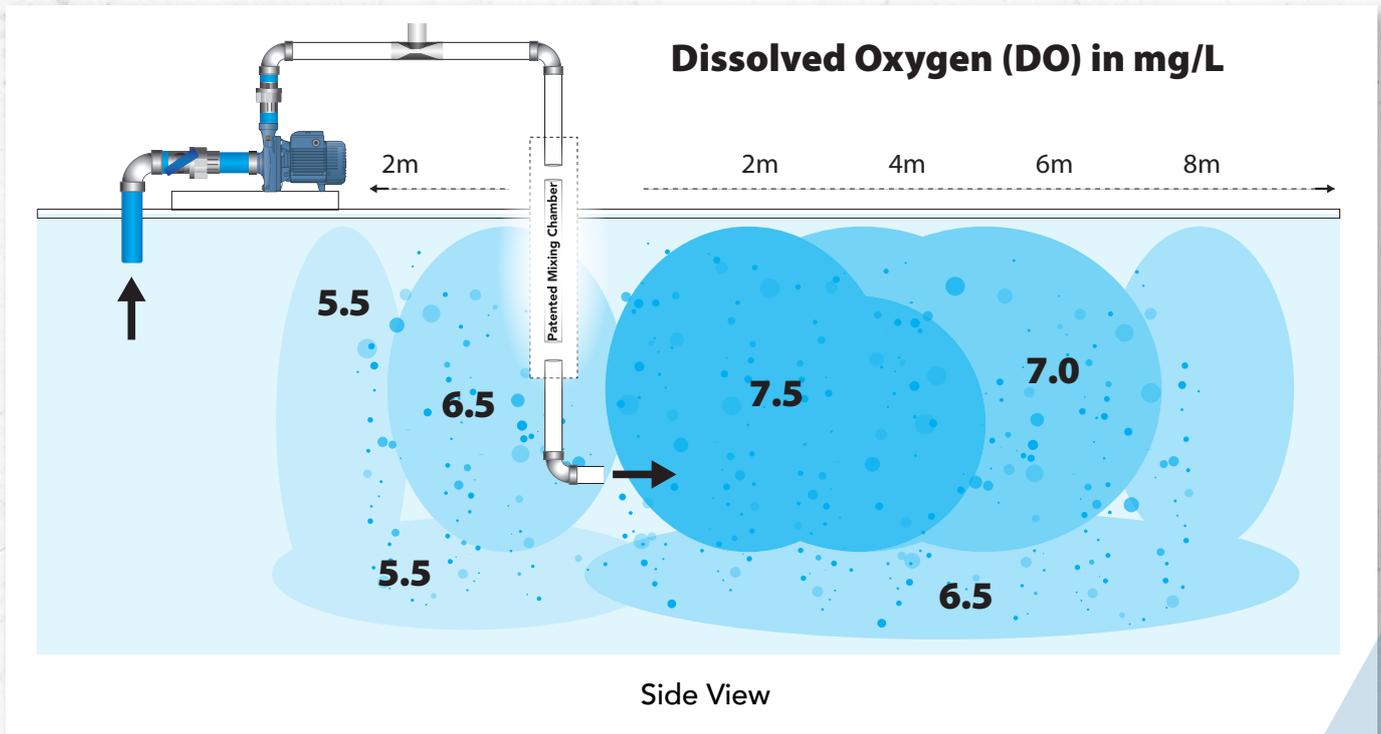


Stage 2 - Secondary Mixing

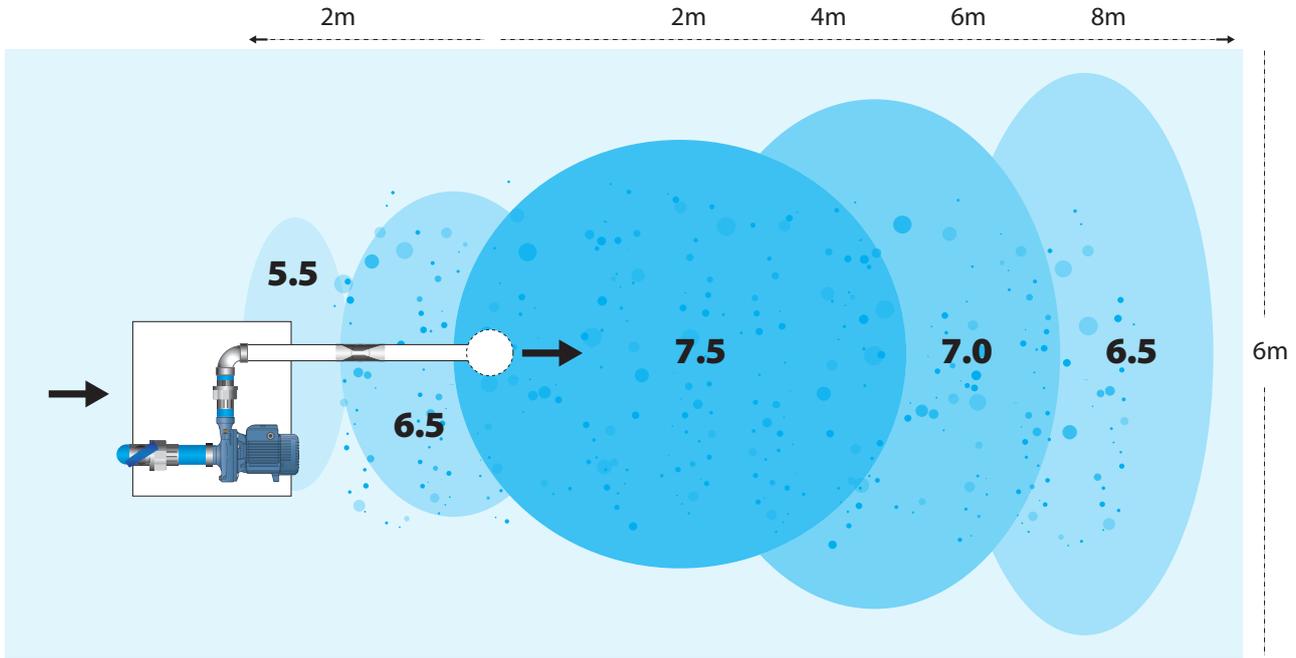
In stage two, a mixing chamber comprised of a series of pipes in varying dimensions is used. It's here where the air bubbles are converted into a fine plume by back pressure and counter-current flow, before they are released at the bottom of the tank – exponentially increasing the aeration efficiency and thereby delivering more oxygen.



OXYGEN DISTRIBUTION - FIELD TESTS IN OPEN WATER



Dissolved Oxygen (DO) in mg/L



Top View

WHALE TOOTH™ AERATION IN WASTEWATER TREATMENT

Our design philosophy is to make robust, low maintenance systems whilst avoiding costly specialised equipment. Whale Tooth™ Technology does exactly that.

The process uses open impellor, centrifugal pumps that transfer liquid through a Venturi. The Venturi draws air into a specific pipe configuration that mixes the liquid and air. Counter-current flow and back pressure is achieved through a patented mixing chamber that causes the aerated liquid to be forced out at high pressure with a fine bubble size at the bottom of the tank. The result is a dynamic agitation and mixing of the effluent with high dissolved Oxygen levels.

There are no small apertures below the liquid line, thus eliminating potential blockages and resulting in a maintenance-free system. The Dissolved Oxygen in a Clearedge bioreactor averages between 4-6mg/L, and can be as high as 7.5mg/L - depending on the biological load.

WHALE TOOTH™ SYSTEM ADVANTAGES



**EFFICIENT
AERATION**



**READILY-AVAILABLE
REPLACEMENT PARTS**



**LOW
MAINTENANCE**



**NO
BLOCKAGES**



**QUIET
OPERATION**



**NO
MINIMUM DEPTH
REQUIREMENT**



**NO
ODOUR**

GET IN TOUCH

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