

BREATHING LIFE INTO LAKES & PONDS



The Dynamics of Diffused Aeration

The single most valuable water management and maintenance strategy is installing aeration to a pond or lake; oxygenated water moving from the bottom up provides a long list of benefits to your water.

Did you know that ponds and lakes age? The older a body of water, the higher the organic muck load and the higher Total Oxygen Demand (TOD). Aeration can stop and even reverse the effects of lake or pond aging; oxygen is the “fuel for the engine” that drives all biological and chemical processes in your water. Nothing will decompose without the presence of oxygen. All the fish waste, dead algae/plant material, leaves, etc. that fall to the pond bottom will only continue to build up unless there are sufficient oxygen levels to maintain aerobic bacteria colonies. These bacteria, in turn accelerate the decomposition process and aid in the overall biological balance of a lake or pond.

Bubbling fountains and diffused air systems are commonly used to increase the natural levels of oxygen. Added oxygen and circulation provided by these devices help to create a stable and productive ecosystem.

Fountains, also known as surface aeration systems, are a popular choice for aeration when wanting a more decorative look. They float on the surface of the lake or pond and spray water into the air. As the water droplets fall back to the surface, they pick up oxygen to redistribute back into the water. Fountains also create



surface ripples and circulation that help control surface algae and duckweed, but doesn't contribute to deep ponds. Shallow ponds, where the sunlight reaches the lake or pond bottom, and wind action helps stir the water, may benefit most from a surface aeration system.

Deeper bodies of water will seldom have good oxygen all the way to the bottom. Diffused air systems utilize a shore-mounted air compressor that pumps oxygen through a hose to a special diffuser lying on the pond bottom. Since the bottom of the pond is where the most oxygen is consumed, it is an ideal way to deliver oxygen to where it's needed the most. As the bubbles rise out of the diffuser, they create a “lifting” or boiling action, which provides considerable circulation throughout the pond. This circulation helps to prevent water stratification.

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Stratification

To help understand the concept of stratification, let's review the two graphics below. The first graphic (A) indicates what occurs in a pond without proper water mixing and oxygen. The body of water can be divided into three layers of oxygen content.

1. Epilimnion – The upper most layer of a stratified body of water

- Warm, typically oxygen-rich
- Recurrent surface scum
- Floating weed masses

2. Metalimnion – The middle layer of a stratified body of water

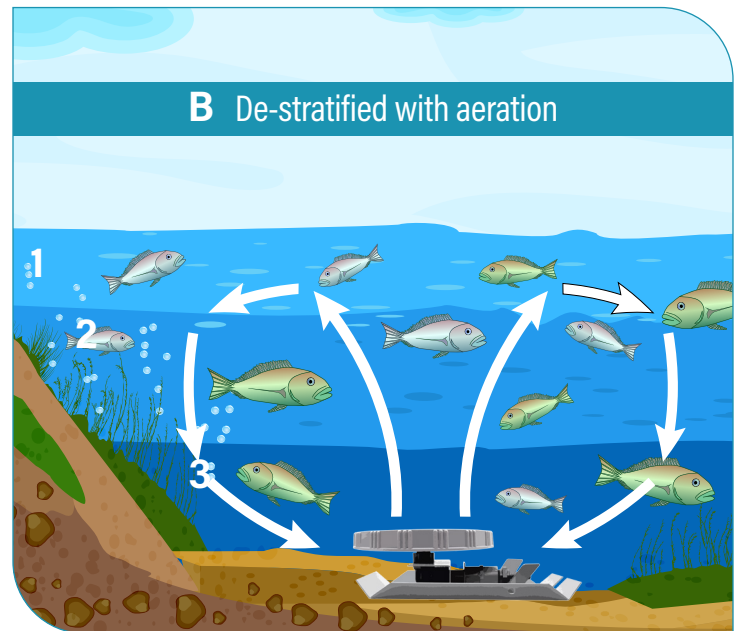
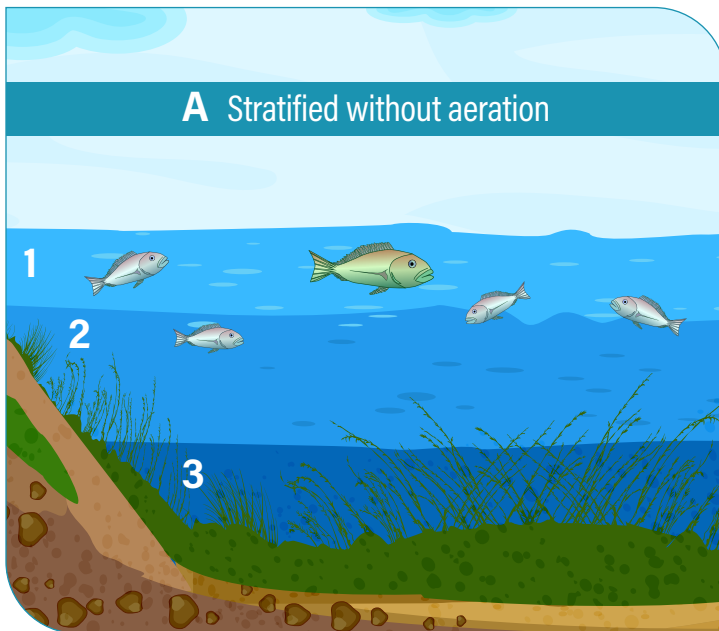
- Zone of decreasing water temperature
- Zone of decreasing dissolved oxygen

3. Hypolimnion – The pond or lake bottom that becomes uninhabited when stratified

- Zone completely void of oxygen
- Cold water temperature
- Accumulating organic muck
- Weeds prevalent
- Unusable by fish and all aerobic organisms

The second graphic (B) illustrates a body of water that has become de-stratified by the boiling action of a diffused aerator.

- Uniform temperatures
- Uniform oxygen levels
- Fish can use the entire pond all year long
- Improved water clarity
- Reversed aging effects
- Improved natural pond bacteria populations
- Fewer aquatic weed problems
- Improved fish habitat
- Less organic material accumulation
- Protection from winter and summer fish kills
- An enhanced pond ecosystem
- Reduced surface scum build-up
- A better swimming and recreation area



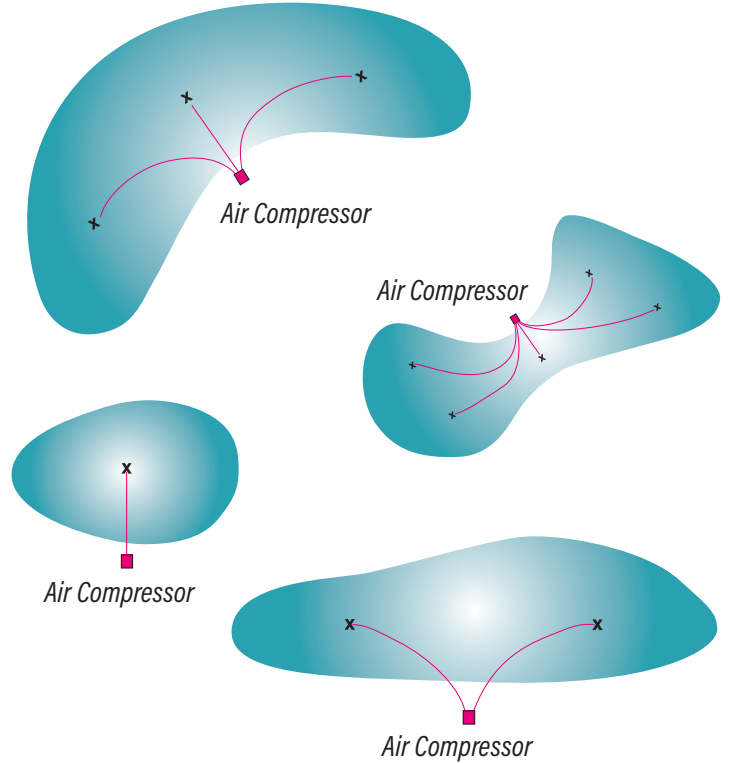
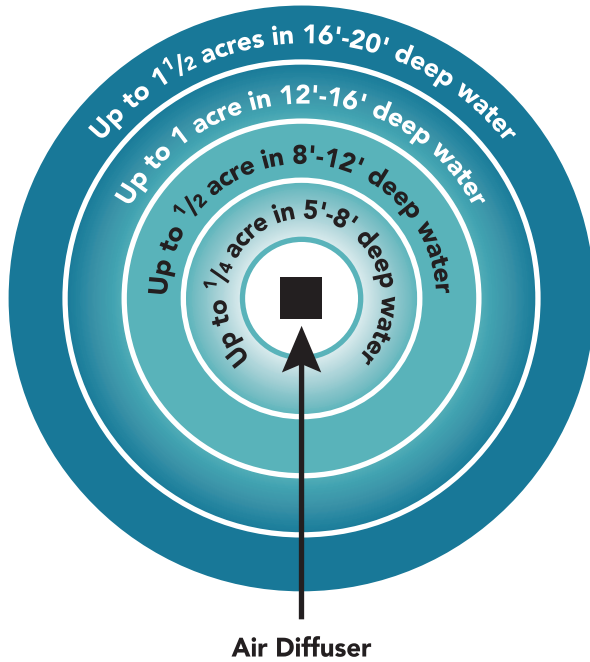
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Aeration Coverage

The amount of surface area an aeration system will effectively cover depends on two factors – depth and shape. The deeper an air diffuser is located, the more boiling action it will create and a larger area will be aerated.

Example: The EasyPro® PA34 pond aerator would aerate only 1/8 of an acre if operated in 4' deep water, but can aerate up to 1-1/2 acres when operating in 16' – 20' of water.

Pond shape affects the amount of diffusers needed. Irregular or odd shaped ponds may require multiple diffusers to adequately aerate entire water column.



A unique shaped pond or lake will require more diffusers to cover the same surface area.

The chart below shows how much surface area is effectively aerated per each basic aeration kit from EasyPro.

Rocking Piston Systems			5' - 8' Deep	8' - 12' Deep	12' - 16' Deep
Base Part #	Horse Power	Diffusers Included			
PA34	1/4 hp	1 or 2	up to 1/4 acre	up to 1/2 acre	up to 1 acre
PA65	1/2 hp	2	up to 1/2 acre	up to 1 acre	up to 2 acres
PA66	1/2 hp	3	up to 3/4 acre	up to 1 1/2 acres	up to 3 acres
PA86	3/4 hp	4	up to 1 acre	up to 2 acres	up to 4 acres

Rotary Vane Systems			5' - 8' Deep	8' - 12' Deep	12' - 16' Deep
Base Part #	Horse Power	Diffusers Included			
PA50	1/4 hp	2	up to 1/2 acre	up to 1 acre	up to 2 acres
PA75	3/4 hp	4	up to 1 acre	up to 2 acres	up to 4 acres
PA100	1 hp	6	up to 1 1/2 acres	up to 3 acres	up to 6 acres

¹PA34-2 will aerate larger ponds - call for details

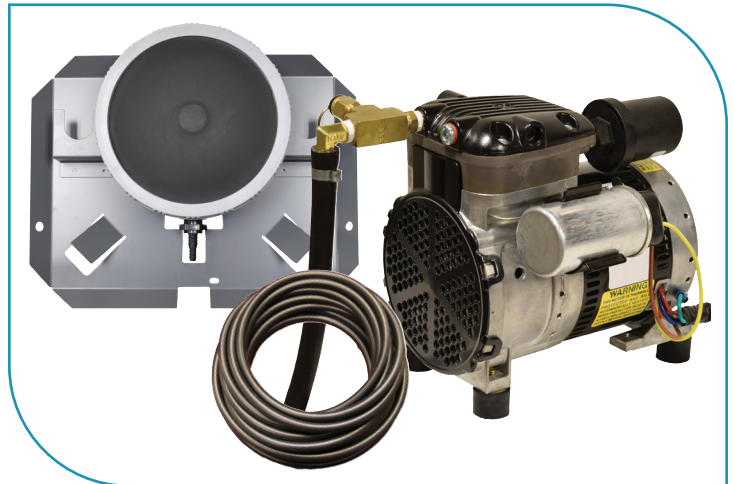
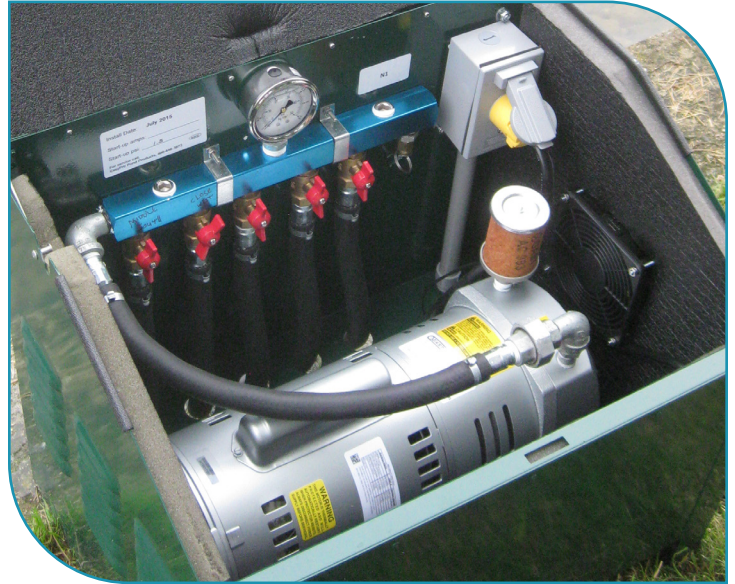
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Selecting an EasyPro® Diffused Aeration System

From individual components to Sentinel Deluxe Aeration Systems, we have a wide range of aeration solutions.

Basic aeration kits include a **compressor, tubing and diffusers**. These systems require that the compressor be housed in a barn, garage or other structure. Sentinel Deluxe systems provide all the components of the basic kits and include mounting the compressor, outlet assembly, fan and electrical components in a lockable weather proof cabinet.

Custom tubing lengths or choosing a preferred diffuser type can be done by starting with a base kit and making appropriate adjustments. Because ponds come in all sizes and shapes, one of our standard kits may not work best for your application.



Need help choosing a system?

Let us know the location of your pond, the average depth and the location of power supply and we can help select or design a system for your pond.

You can call us at 231-834-7720 or fill out our online form to submit your Aeration System Request.