

## *Turbine Aeration System*

### OVERVIEW of System Specifications

#### Floating Surface Self-Aspirating Turbine Aerator:

Capacity:	36 liters per/sec (76 ft <sup>3</sup> /min) of air injection as micro bubbles transferring 4.7 lbs of oxygen/per horsepower hour. (Approximately 450 lbs of O <sup>2</sup> per/unit/day.)
Motor:	5 hp, 3 phase or single phase, 60 hz, 240/480/575 volt, industrial grade motor.
Pontoons:	¼-inch thick polyethylene shell, filled with closed cell foam, UV protected.
Pontoon System:	LWH = 68" X 44" x 36", 240 to 300 pounds.
Turbine drive shaft/air shaft:	1 ½-inch outside diameter, 304 Stainless steel, ¼-inch wall thickness.
Turbine:	High density nylon embedded with 30% fiberglass for corrosion and wear resistance.
Low water legs:	Polyethylene legs for low water safety to protect the turbine and pit liner.
Debris Sleeve:	Installed around the air shaft, if needed, to help prevent strings, rags, etc., from wrapping around the air/drive shaft.
Electrical Panel Option:	IP 66 Nema 4x Weather proof box w/motor starter, overload protection, on/off switch, w/optional Variable Frequency Drive.

#### VaraCorp's Air Turbine

VaraCorp's air turbine uses the twin physics principles of *precession* (as applied to rotating fluids) and *centrifugal force*. Precession creates the low pressure zone which draws in the surface air.





Once inside the turbine chamber, this air is discharged rapidly through the power of centrifugal force.

There are two important factors that further distinguish VaraCorp's turbine aerator. First, the centrifugal force slings the air outward at a high speed in a lateral direction.

Second, tests in a clear water tank have shown that the dissolved oxygen is also pushed downward up to ten feet below the surface. These forces create a mixing and sheering action which produce and disperse micro bubbles. The air turbine offers a gross air transfer volume up to 76 cubic feet per minute.



Finally, VaraCorp's air turbine aerator requires no routine maintenance. There are no bearings to grease or floats to be checked. The aerator's polyethylene pontoons are filled with closed-cell foam, are UV protected, and are guaranteed not to sink, even if punctured. The motors are hazardous duty, industrial- grade, designed to run 24/7. The air shaft is made of a stainless

steel tube that has a ¼-inch thick wall. The rotating turbine is made of nylon imbedded with fiberglass making it both corrosion and wear resistant.

The aerator prefers to be left alone once it is turned on, i.e. no need for routine maintenance or inspections.

Also, note that VaraCorp's 3-horsepower air turbines have replaced 20-horsepower propeller-type self-aspirating aerators on a one-for-one basis in a municipal wastewater lagoon. The result was an *increase* in dissolved oxygen from 4-5 ppm to 5-7 ppm. (These results, though seemingly impossible, were carefully recorded over several weeks of daily lab tests.)

The current pontoon system consists of a 5-horsepower industrial-grade motor, pontoons, air shaft, and air turbine. Optional: Nema 4x Control boxes with motor starter, overload protection and outside-the-box on/off switch. A Variable Frequency Drive can also be added for more versatile operation with RPM control and remote operation control.



The Pontoon Aeration System Includes:

1. Polyethylene pontoons filled with closed-cell foam and protected against UV damage.
2. ¼-inch thick stainless steel air/drive shaft.
3. Turbine.
4. 5 H.P. Industrial Grade Motor. (Single or 3 phase, at any voltage)
5. All stainless steel hardware.
6. Eye bolts for cable anchoring.

