



PLANET FRIENDLY®  
Est. 1994

Soft Oxidation with Carbon Dioxide pH Control

## ECOsmarte's Aquaculture System

35,000 to 1.0 Million U.S. Gallons  
Retail Price: \$4,995 - \$39,950

ECOsmarte offers the most efficient system in the world to raise the dissolved oxygen in water, beneficial in all aquaculture applications.

This efficiency permits major reductions in ammonia, nitrite, nitrate and pathogenic microorganisms. The ECOsmarte cost efficiency is based on wattage of power (versus aeration or ozone), maintenance of cell and replacement. ECOsmarte uses just 6 watts of power per 50,000 U.S. gallons, warrants the titanium/platinum oxygen anode for five years and requires just 15 minutes of maintenance per week or month.

- Soft oxidation of contaminant's prior to filter nitrification.
- Soft oxidation of organic compounds -- raising dissolved oxygen.
- Removal or reduction of ammonia, nitrate and chloramine even in warm water.
- Disinfection of bacterial, (heterotrophic) fungal and protozoan aquaculture pathogens.
- Removal of colloidal solids with proper filtration.

ECOsmarte is compatible with all filtration and water treatment strategies including UV and OZONE. ECOsmarte recommends Glasspack® filter media in all sand, gravity or low pressure filtration vessels. ECOsmarte generates ZERO OZONE eliminating toxicity issues. Glass media will not load phosphates or nitrate and uses 1/2 the water of zeolites.

Since 1997 ECOsmarte has been the world leader in carbon dioxide pH control in either high or low pressure environments and has perfected the injection without sensors.



40 Grams per MINUTE  
of O2 Oxygen per Cell

\$3 Million KOI  
Case Study  
On Reverse



# Glass Pack®



1600 East 78th St. Richfield, MN 55423  
(612)866-1200 (800)466-7946 US, Canada, Mexico  
[www.ecosmarte.com](http://www.ecosmarte.com)  
[www.glasspackfilter.com](http://www.glasspackfilter.com)



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## Three Million Dollars of KOI with 12 Feet of Depth

By: Larry Couture

Dale Price had no illusions that a 60,000 gallon pond would operate crystal clear with the “natural” biological filters proposed by local pond builders in the mid 1990’s. His first attempts were unsuccessful as the pH of the pond water wanted to be 8.5 and his biological filters and UV could not maintain clarity.

Price knew that as the KOI fish grew he would be violating every pound per gallon rule in the KOI books. With his wife, a veterinarian, he embarked on a one year build and water treatment effort to have one of the most valuable KOI collections in the U.S. displayed in crystal clear water with unique flora on the bottom.

The pond is twelve feet deep, oval in shape with a complete water garden bottom. A small peninsula protrudes so he can ring his liberty bell to summon fish for feeding, often from the hand.

Price first began with a 30 GPM well water turbo system from ECOsmarte to treat his home, irrigation and auto fill needs for the pond. The natural oxygen and ionization chambers for the home resulted in .10 to .15 ppm residual copper going into both his residence and the pond on the replenishment water.

The residual was never measured however in the main pond, probably due to the 2 900lb bubble bead biological filters. Upon ECOsmarte’s recommendation Price installed 2 Zeolite filters with an ECOsmarte KOI oxygen system to prevent ammonia buildup from the large KOI, harmful both to the KOI and their water garden plants. The CO2 ph injection system from ECOsmarte was also required to keep the pond from reaching the 8.0ph that existed in Price’s well, particularly after the daily KOI feeding. Ph was ultimately maintained in a 7.2 to 7.6 range with carbon dioxide injected 24/7 and even backed up by a sulphuric acid injector that kicked on by sensor when ph levels hit 7.5.

The pond hit 80-90% clarity on a daily basis, still not acceptable for Price and the pond also developed periodic string algae. With his wife’s, the veterinarian, help Price decided to introduce copper to the pond to get rid of the string algae and strive for 95-100% daily clarity in the 12 foot deep pond. Veterinarians and fish stores had used low level packaged copper but always indicated to consumers that copper was toxic to KOI.

With daily monitoring of the copper levels, .10, .15, .20 and finally .25ppm copper was introduced with the KOI fish monitored. Price reported at .25ppm his fish “were not happy” and levels were scaled back to .15ppm - - enough to eliminate string algae and get clarity to almost “mirror quality”.



After one year of monitoring a .15 ppm copper was added to achieve maximum water clarity.

1999 International KOI Tour  
Winning Pond at [www.ecosmarte.com/koipond.html](http://www.ecosmarte.com/koipond.html)

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