

Newsletter




- **Testimonials**
from satisfied Clarity users around the world
- **My Experience with Clarity**
by Dennis Wordsworth
- **The principle of foam formation**
- **Technical specifications**



Clarifications

A newsletter for Clarity Water Treatment Systems AS



Fall 2007

www.clarity-wts.com

Dear Koi/garden pond enthusiasts

Like the world we live in, a Koi pond is a complex biosphere with many components and variables. The beauty of the world and a Koi pond working together, create something far greater than the sum of the individual parts. This is what attracts us to the Koi pond - and to the world.

However, there can also be imbalance in this biosphere; perhaps too much of one component or too little of the other. The result of otherwise seemingly insignificant changes can have far-reaching and serious consequences. In such situations, we search for ways to mend the damage, or minimize the effect of the damage. In most instances, considerable effort is put into this so-called "fire-fighting". Strategies and solutions are sought, but what we often see is that by changing one condition to improve the situation, the delicate balance is affected and harmony is disrupted. We must look at what caused the problem in the first place.

By focusing on what the real problem is, and understanding it, we can take corrective action and introduce optimal conditions in the biosphere. This restores the original and intended conditions and enables us to once again enjoy the beauty of the Koi pond and the world in which we live.

We cannot solve the problems in the world - but we can help you create optimal conditions in your Koi pond.

Enjoy your pond!

The CLARITY Team



Clarifications is a communication piece from CLARITY WATER TREATMENT SYSTEMS to various customers around the world.

It highlights some of the features and benefits of Clarity Protein Skimmer, and its applications in different fields.

For more information on Clarity, and to subscribe to future issues of Clarifications, please go to our website: www.clarity-wts.com



Table of contents

| | |
|---|---------|
| Greetings from Clarity | Page 2 |
| Testimonials | Page 4 |
| My Experience with Clarity | Page 7 |
| Why a Protein Skimmer / Foam Fractionator | Page 10 |
| The principle of foam formation | Page 10 |
| Technical specifications | Page 11 |

This is Clarity™

Why the Clarity Protein Skimmer is special:

- First ever truly effective protein skimmer for fresh water
- Proven track record of success in improving water quality in fresh water ponds/Koi ponds
- Improves fish skin and health
- Reduces the need for other water treatment requirements
- Patented technology – granted patent in the US and Norway – pending in many other countries around the world
- Available for smaller ponds (up to 10 000L) and larger ponds (over 10 000L)
- New and improved versions available
- Broad applications in many areas

USA

We had achieved what we thought to be the highest level of water quality possible with existing water treatment technology, this being zero ammonia, zero nitrites, zero nitrates - with stable pH and alkalinity parameters as well. One nagging problem remained however - organics. There seemed

no way to eliminate them altogether. Water changes were not accomplishing much. At certain times of the season,

"We have achieved pond water nirvana!"

small bubbles would remain at the base of the waterfall, and float as little islands around the pond. Very aggravating! We had begun to think that we would have to live with this, or get rid of half of our koi, which we were not about to do. We were introduced to Clarity Protein Skimmer, which claimed to eliminate organics. I placed an order for one unit and had it installed when it arrived. The result was truly amazing.



The foam began to form immediately. Not just small amounts, but HUGE amounts (see picture). The results have been far better than we could have ever expected. We still produce foam, which falls nicely out of the side of the unit and onto the lawn below. The clarity of our water has improved significantly, we see brighter colors on our koi, and, of course, no more aggravating bubbles. We have achieved pond water nirvana! The

Clarity unit is most definitely the biggest improvement in pond water treatment technology since the Nexus Easy.

*Bryan Bateman
Koi enthusiast and AKCA (associated Koi clubs of America) certified Koi Judge*

United Kingdom

While a total cynic, I like to look at all new developments in Koi, this sounded too

good to be true. However I have used the unit now for almost a year and I'm amazed at what a difference it's made. I thought my water was pretty good before but now it's like glass and sparkles. Add to this the benefit of significant reduction in

blanket weed, and it's a pretty compelling combination of benefits.

Jonathan Alcock

"I'm amazed at what a difference it's made."

Testimonials

feedback from around
the world

AUSTRALIA

Despite having a three year old Koi pond with crystal clear water and healthy fish, our nitrate level was over 200. We do frequent water changes but as quickly as the nitrate reading goes down, it then returns to high levels. We managed to get the nitrate level down to around 120 with water changes. After installing Clarity for only 13 days, nitrate has come down from 120 mg/l to 40 mg/l, and phosphate from 0.25 mg/L to <0.1 mg/L! The other

parameters of our pond which was good are constant. These readings are doing a great job of convincing us that the Clarity Unit does reduce nitrate and phosphate which is what we wanted for our pond. In fact I must say we are totally thrilled with the product because it has also made our water crystal, crystal clear. We thought it was clear before, everyone who looks at our pond says we have the best water they have ever seen, but now the Clarity has taken our water quality to this even higher level, a fantastic standard. . The fish

"Now we won't have to do all those constant and time consuming water changes"

are also doing very well, I think their colours look more vibrant and the white seems brighter too."

*David Lonergan & Michelle Cranra
Sydney, Australia.*



United Kingdom

I would like to tell you all about the new Clarity unit which I have had put on my pond now for a week. And the results are unreal the water is so clear it's untrue. It was clear before but mat could not believe how clear

it is now its like glass. They put the same one on Bill Oakley pond over a year ago and he said his water was great before but now it even better

"NO more blanket weed for me any more – a must on any Koi pond."

now. Also he said the growth of his Koi is even better now as well since the charity unit was put on. Also my nitrate was over a 100 a week ago now it down to 20 and that in a week so NO more blanket weed for me any more – a must on any Koi pond

Derek from Liverpool

United Kingdom

For years I have been haunted by the dreaded blanket weed, and although I haven't had a full season with the unit the level of blanket weed in my pond is dramatically reduced. The unit removes DOC, micronutrients and organic nitrate and judging by the amount of foam it generates, does it extremely effectively. It's clear to me that this unit offers an elegant, compact, highly effective additional stage of filtration.

*Bill Oakley,
United Kingdom in 2006*

"Clarity has made a significant contribution to the quality of my water and to the benefit of the Koi"



*Picture taken at the BKKS show 2007.
(Bill in the middle, Dennis and Gary on either side)*



*Bill Oakley's Grand
Champion Kobaku*

My Experience with Clarity

by Dennis Wordsworth



Dennis Wordsworth and Peter Waddington at their Infiltration office, UK.

A few years ago when Peter Waddington and I were in Japan we arrived back at the Grand Hotel in Nagaoka, and in the lobby were two men who introduced themselves to us.

They were from Norway and had come over to look at koi in Niigata. Their names were Stein and Steinar and they asked us if they could spend

a couple of days with us looking at koi. Over the next two or three days we got to know them better, and asked a lot of questions about how they kept koi in Norway. Steinar was always talking about the new skimmer that he had made. It was working on his koi pond at home and was getting great results.

The story unfolds

At Infiltration a year later we were still talking about the skimmer which Steinar thought would have an appli-

cation for Koi keepers and other businesses involved in keeping good water quality.

Then one day I had a phone call from Steinar who asked me if I would like to come to Norway, and see the prototype skimmer that he had made. I phoned my friend Gary Joynes - a fanatical Koi keeper - and asked him if he would like a trip to Norway. Despite Gary being a little nervous of flying we were both curious to see the results of the skimmer that Steinar had designed.

We arrived in Oslo on a very beautiful day to be met by Steinar and pro-



Steinar's Pond with the first prototype skimmer

ceeded to his home through fabulous countryside. On arrival a cup of tea is the order of the day and then into their lovely garden.

Looking at the koi pond about 8,000 gallons, he did have good filtration with Japanese matting and Kaldness. The skimmer was working on the opposite side of the Koi pond, and the water had an amazing sheen despite the numbers of Koi.

Gary and I were amazed at the amount of foam coming out of the bottom of the unit and wanted to know how it worked. Steinar explained that the water was falling through a media in the unit causing protein to foam to waste. It was the most effective protein skimmer that we have ever seen.

Steinar had found out that he could increase his feeding rate and still produce great water quality when using the skimmer. Also no traces of the dreaded blanket weed. Not so easily achieved in any Koi pond. We then went into his garage and saw a smaller Clarity working on a growing on pond with up to 500 baby Koi 10cm.

Flying back to the UK Gary and I were in deep conversation about what we had seen and I was thinking about who to ask to trial it. Gary immediately said yes, but I needed two

ponds for a trial, Bill Oakley was an obvious choice. When I talked to Bill two days later he was very interested in what the Clarity could do for his water quality and his Koi, so he agreed to have one on his home pond.

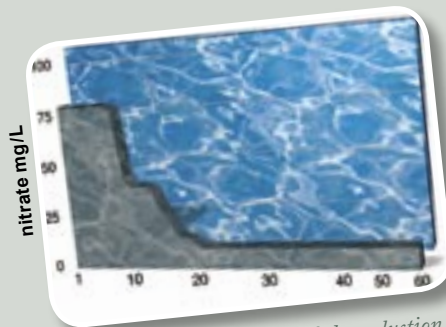


Gary feeding his Koi and the new Clarity unit in-

weed was nearly zero. The first time ever! Bill has since put a Clarity on his second koi pond.

Gary's pond was slower to work because of different stocking rates and feeding regimes plus GH & KH differences. Also the nitrate went up before coming down.

However the outcome was the same. The water quality improved. The skin quality Improved im-



Graphic representation of the reduction in nitrate level in Gary's pond

A few weeks later Steinar came over to set up the Clarity on Gary and Bills ponds. Within two minutes of operation, Bills started foaming and one year later his results are amazing. The skin improvements are fantastic, as this year Grand Champion at the National Koi Show demonstrated.

My time looking after Bills Koi dramatically dropped. Also the nitrate dropped dramatically and the blanket



Picture of Bill Oakley's Matsunosuke Kohaku Isawa This years BKKS National Winner 2007



Clarity installed in Roy Pillay's pond in South Africa

"- It was the most effective protein skimmer that we have ever seen..."



mensely, and the blanket weed after the nitrate stabilised dropped off. In both ponds the feeding was much better.

South Africa

Another great pond I visit is Roy Pillays in Durban South Africa. It is 18,000 gallons and 8 feet deep. The water temperature in their winter very rarely drops below 19°C - we can all dream! But he does have to use a chiller in the summer months. A Clarity was fitted about 1 year ago and now is producing the same brilliant results as in Bills pond. The skin quality, water and health, and feeding all improved. Roy only keeps 13 Jumbo Koi in his main pond and this year won the all

South African National Show with his Matsuosuke Kohaku in Durban.

He also does run a quarantine system with 2500 gallon, and he intends to fit a smaller Clarity on this pond later in the year.

Dealers as well as hobbyists are now using Clarity. At Infiltration the Clarity was fitted on the main pond, which is 8000 gallons in December 2006. Since then it



has been noticed that no koi have had to be treated for even small damages, and the amount of medica-

tion has been considerably reduced.

In conclusion, the Clarity has come a long way. Three years from discovery, to the prototype, to a protein skimmer on the market that can make an enormous difference to water quality, skin quality, feeding and general health of the Koi. I am really looking forward in the future to see many more Koi ponds with the Clarity fitted.

Dennis Wordsworth

- in Peter's Waddington's shadow

Why a Protein Skimmer / Foam Fractionator?

Water in confined areas (e.g. fish tank, pond or lake) has a certain level of organic waste and nutrients which affect the quality of the water. The organic compounds cannot be seen directly; however, once the level is high enough, the effects can be seen in the water. Some of these effects are:

- Increased algae and bacterial growth
- Decreased clarity
- Poorer fish health
- Decolourization
- Unpleasant smell and taste

Many devices and procedures exist to remove some of these effects (e.g. mechanical, chemical or biological filters, or simply exchange of



water), but Protein Skimmers or Foam Fractionators remain the preferred choice for removing the organic waste from water.

The organic waste (also referred to as Dissolved Organic Compounds = DOC) results from decomposed plant matter, fertilizers, fish fodder and excretions from farmed fish, which have been broken down and dissolved in water.

High levels of DOC are undesirable in the water because it leads to:

- Less oxygen
- More bacteria, algae and parasites
- Build up of ammonia, nitrite and nitrate, which are toxic to the fish

Altogether, this results in unhealthy conditions for the fish, affecting both health and growth conditions of the fish, as well as undesirable environmental conditions.

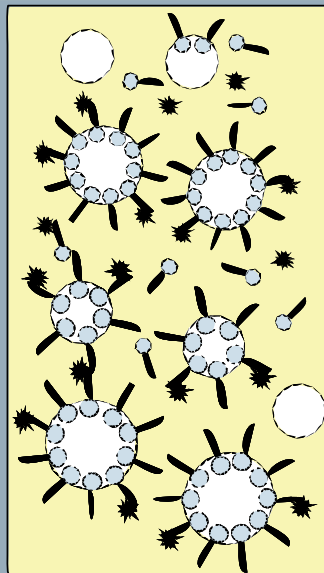
The principle of foam formation






Protein Skimmers, also called Foam Fractionators, work on the principle that most DOC and nutrients in the water have bipolar properties, meaning that one part of the compound prefers air and the other part prefers water. This means that these compounds are attracted to the air bubbles in the water, where there is an interphase between air and water. When sufficient DOC has bound to the air bubble, stable foam is created and collected. The smaller the air bubbles, the larger the surface area and more effective the Protein Skimmer or Foam Fractionator works.

Due to the lower density of fresh water compared to salt water, the air bubbles that forms in freshwater is larger than the bubbles formed in salt water. This means that the fresh water bubbles has less surface area, and most of the bubbles formed in fresh

Principle of foam formation:

DOC and particles are trapped in the air bubbles and form stable foam.



-  Air bubbles in the water
-  Dissolved organic compounds (DOC)
-  Hydrophobic (water-hating) end of DOC
-  Hydrophilic (water-loving) end of DOC
-  Other particulate matter

water are not stable enough to form stable foam. This is the reason that traditional protein skimmer / foam fractionators does not work very well in fresh water.

Clarity is based on an entirely different approach to form bubbles, and therefore does not have the limitations in fresh water associated with traditional protein skimmers.

In addition, since the DOC trapped in the foam contains charged molecules, other charged molecules in the water, such as other nutrients and particulate matter, will also be trapped in the foam.



Foam created by Clarity

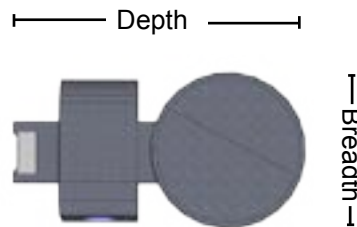
Technical specifications

| Item no. | Capacity (L/hour) | Recommended volume (L) | Dimensions (Height/Depth/Breadth) cm | Connecting tube diameter (mm) |
|----------|-------------------|------------------------|--------------------------------------|-------------------------------|
| CL 3 | 3 000 | 3 000 - 10 000 | 115/70/30 | 40 |
| CL 10 | 10 000 | 10 000 - 30 000 | 135/85/40 | 50 |
| CL 25 | 25 000 | 25 000 - 75 000 | 165/120/60 | 63 |
| CL 50 | 50 000 | 50 000 - 150 000 | 200/165/80 | 90 |

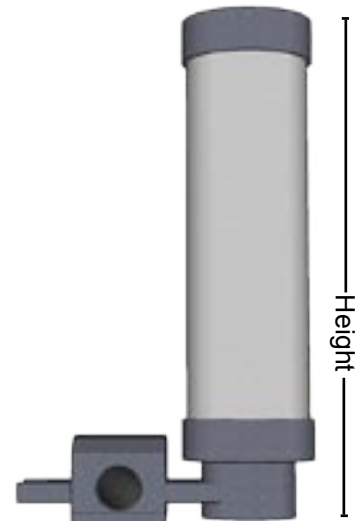
Connecting tubing and pump not included. For best performance we recommend a high quality pump with sufficient strength to lift the required amount of water at least to the top of the skimmer, including the height from the water level to where the skimmer is fitted.

It is also important to remember that the connecting tube will be attached on the top of the skimmer, so

you will need some extra head-space to attach the connecting water tube on top of the skimmer.



Top view



Side view



CLARITY Water Treatment Systems AS

c/o Bioparken AS

Saghellinga A

N-1432 Ås

Norway

Tel: +47 92 69 15 17

Fax: +47 64 94 84 35

info@clarity-wts.com

www.clarity-wts.com

IMPROVE WATER QUALITY INCREASE FISH HEALTH

www.clarity-wts.com



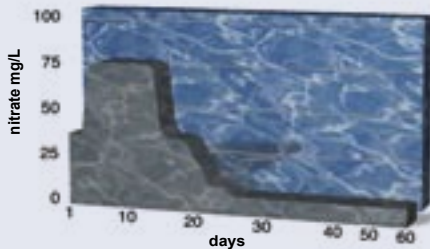
“Removes the problems of excess nutrients in the water, instead of just treating the symptoms.”

- Significantly reduces unwanted organic waste
- Ensures stable water-conditions
- Creates optimal health and growth conditions
- Low maintenance

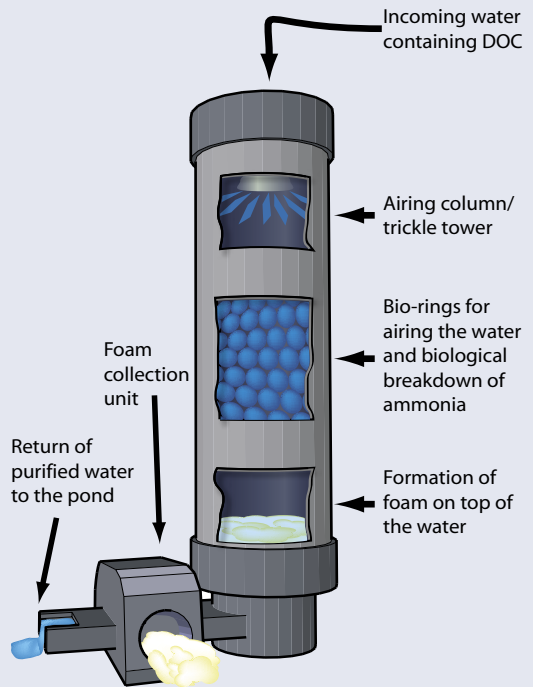
“A protein skimmer that works in fresh water and does not pressurize the water - *that’s a breakthrough!*”

Prof. Thomas Losordo
North Carolina State University

Removal of nitrate from a Koi pond



The effect of treatment with Clarity™ on the nitrate level in a Koi pond over time. Notice the initial peak of nitrate as the algae in the pond is deprived of nutrients, and the stable, low level of nitrate as Clarity stabilises the pond.
(Courtesy Gary Joynes, UK)



For more information, contact:


Water Treatment Systems AS
www.clarity-wts.com

Purdin Koi Farm
Louisiana
Tel: 800-530-1626 or 225-627-6762
sales@purdinkoi.com
www.purdinkoi.com

design: Kjetil Strøm-Hval @ iShop . no



Clear and Clean