

SEABay

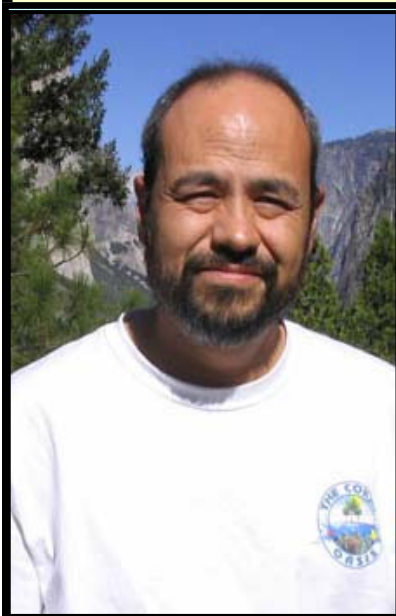
Saltwater Enthusiasts Association of the Bay

July 2008

www.seabay.org

Volume 13 No 4

Sept 20 meeting: **Frank Burr—Low Maintenance Marine Systems**



Frank Burr of *Tropical Reef Oasis* and author of several books related to marine systems will give a presentation on various methods and techniques used to design marine systems ranging from 1 to over 200 gallons, that require minimal maintenance within 6 months of initial setup. Also discussed will be livestock requirements and how they can help achieve a more balanced, self-sustaining system. Sure to be a fascinating talk and not one to be missed—so see you there.

From the President ...

Hi Folks,

Summer is here with longer days and warmer temperatures. It may be a real concern for some of us. This time of year we must keep check on extreme temperatures changes in our tanks, especially to warm. If you are having trouble keeping the tanks cool you may consider some of the following suggestions to help keep temperatures

under control: You may consider using fans and or chiller to control heat. Turning off your high powered lighting system for limited time periods or even shutting them down would help. Keeping our invertebrates and fish at a comfortable temperature is very important. Remember, many of these animals will not survive for long extended periods of time at high temperatures so be prepared. Severe temperature swings may cause problems.

Our last general meeting May 17, 2008 "Virtual Tank Tours" was a delightful one. The members and others were given the opportunity to show and talk about their aquariums. SEABay also provided Pizza and beverage that night making for a very enjoyable evening together.

SEABay is taking a summer vacation this year so **no general meeting in July.** This is not to say the

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Dosing "Kalkwasser"

Aquacare



What is lime water "Kalkwasser"?

Lime water "Kalkwasser" is an old method developed for waste water treatment. PETER WILKENS discovered it for coral reef tanks. To produce "Kalkwasser" you need the chemical Calcium Hydroxide (Calcium Oxide is possible, too, but it has disadvantages in handling) in a very pure quality and pure water e.g. Reverse Osmosis Water. Calcium Hydroxide is very soluble but you can only dissolve very low quantities in water:

The pH value of fresh saturated "Kalkwasser" is about 12 and 13 depending on the temperature. So lime water is a strong base and dangerous. You must handle it very carefully. At contact with skin or eyes flush with plenty of water and if necessary, go to the doctor.

There is another disadvantage: if lime water is standing in an open tank the CO_2 of the air dissolves in the water and neutralizes the "Kalkwasser" very quickly. Within 1-2 days "Kalkwasser" will be destroyed. So you must work with a fresh solution or you need a "Kalkwasser" Reactor / Chalk Mixer.

Advantages of lime water "Kalkwasser"

If lime water flows into the aquarium water the pH will rise very fast. To prevent this effect you must only drop the "Kalkwasser" into the water (about 1 drop per second and 100 liters aquarium size). At the dropping point in the water is a small place with a very high pH value. At this place phosphate will precipitate to calcium phosphate. So phosphate levels will be reduced.

If you use the lime water method and KH in the water is sufficient (minimum 7°dH) the pH will be 0.1 to 0.2 higher. With this slight pH increase the balance of CO_2 - carbonic acid - hydrogen carbonate - carbonate will be a little bit more on the side of carbonate. So there is a little bit less free CO_2 in the water. As algae growth is stimulated by higher



Fresh slurry of limewash ("Kalkmilch"; right) and after about 20 min. time (left): at the bottom the limewash has settled (calcium hydroxide - water—mixture), over it there is the turbid lime water ("Kalkwasser") that you can drop into the aquarium water.

CO₂ and phosphate levels you will help keep it under control with use of "Kalkwasser".

Dangers with lime water "Kalkwasser"

Like all methods lime water has disadvantages too. If the pH in the aquarium is already very high (over 8.3-8.4) you should not use this method - or fish may have trouble.

In aquaria with lower nutrient levels (hard coral tanks with less fish and less feeding) the addition of "Kalkwasser" can cause a too low a phosphate level. In this case you have to feed more to get more phosphate into the tank. Artificial dosing of phosphate is possible, too. The phosphate concentration should never fall below 0.05 mg/l. If the concentration is lower you will have problems with growth of hard corals and clams. Maybe in the future it will be possible to feed the corals with living plankton extensively. Then the phosphate concentration may be at zero because the animals will get the phosphorus and



Especially heaters, pumps and heat exchangers can block easily at high calcium concentrations and KH (alkalinity) values. Dosing of lime water will speed up the precipitation.

nitrogen with the plankton. In healthy reefs this feeding is the normal way.

The lime water dosing can cause carbonate precipitation. Therefore it is very important that the "Kalkwasser" is not introduced near any pumps. Otherwise the pump can quickly develop chalk crusts that will hinder the pump's operation. The "Kalkwasser" should never be dosed the near of the outlet of any CO₂ calcium reactor either due to similar danger of calcium precipitation.

If the lime water is the only method of adding calcium a reduction in carbonate hardness (KH) can occur. It is

best to combine other methods like calcium reactor, KH-plus, triple buffer to maintain KH levels in the water.

Chalk reactor and "Kalkwasser" and KH-plus / Triple Buffer?

You may occasionally hear that "Kalkwasser" and CO₂ calcium reactor will not work together very well. The only problem you might have is if both outlets of "Kalkwasser" and calcium reactor's outputs are together at one point. At this point Calcium Carbonate will precipitate and the efficiency of both systems

Upcoming **SEABay** speakers and events:

The SEABay board has been busy lining up a really excellent group of speakers and events for the future. Take a look at what we have coming up and remember that its your continued support for SEABay that makes all this possible.

*July 2008: **Summer vacation***

*September 2008: **Frank Burr** —Low Maintenance Marine Systems.*

*November 2008: **Bart Shephard** — Opening of new Steinhart Aquarium.*

We are always looking for new suggestions for speakers and topics so let us know what and/or who you want to hear or hear about and we'll see what we can do.

will drop. But if both outlets are far away from each other or the systems are not working at the same time, nothing will occur and you have the advantages of both systems:

First, the CO₂ in the aquarium water that is introduced by the calcium reactor will be neutralized partial by the "Kalkwasser" (pH rising).

Second, the lower buffer capacity (KH value) that results from "Kalkwasser" input will be compensated with a calcium reactor.

With the combination of "Kalkwasser" and calcium reactor you can also lower the daily pH oscillations: at night the "Kalkwasser" will help compensate the falling pH and during the daytime the calcium reactor will reduce the increase of the pH.

It is possible, too, to combine Carbonate Hardness supplies (e.g. KH-plus, Triple Buffer), Calcium solutions (e.g. Calcium-plus) and Magnesium solutions. These substances are useful in small aquaria

if the installed systems (e.g., calcium reactor, "Kalkwasser" Reactor) are insufficient. In some aquaria one of the two values of calcium or KH may not be in balance. In that case you can rise the deficient parameter with the appropriate additive.

How much lime water "Kalkwasser"?

This question is very easy. Fill up all the evaporated water with "Kalkwasser". Be careful in aquaria with a very high pH (over 8.3 to 8.4). If you fill up the "Kalkwasser" too quickly a calcium carbonate precipitation will occur. The water will get turbid very fast - you can see only a few cm into the water. This is not dangerous for the animals! It is important to react in the proper way: stop the "Kalkwasser" dosing at once. You will see that the "white" water will disappear within some hours. If the water is clear again check calcium and KH value.

Supply of "Kalkwasser" by hand

The simplest method of dosing "Kalkwasser" is to use a plastic tank with cap. Fill about 1 tea spoon per 5 liters water (1 gallon) into the plastic tank. Add reverse osmosis water (or very soft water) to the powder, close the tank with the cap and shake it. If the tank (or the cap) has small valve you can open it after about 1 hour and the clear "Kalkwasser" will drop into the aquarium water. In the top of the tank there must be a small hole to let air into the tank - otherwise the "Kalkwasser" will not drop out.

It is very important to use a closed plastic tank (with a very small hole at the top). Otherwise the CO₂ of the atmosphere will lower the efficiency of the "Kalkwasser" very fast. A part of the "Kalkwasser" will transform to a hard chalk crust. You will see that the outlet valve and tube must be maintained very often. Any crust build up can be cleaned with a weak

acid (e.g., vinegar).

The dosing by hand is a very low cost system but you must maintain it of-



The AquaCare lime water reactor KWR has a rigid pump that circulates the lime wash (chalk milk).

ten. The "Kalkwasser" must be produced very often (every 2 or 3 days) because after this time the efficiency will be lowered very fast. The handling with very big tanks is very complicated and dangerous. Remember: the lime water is a strong alkaline substance (pH 12-13). It is not easy

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Editorial contributions are welcomed!

Please submit your articles to the editors (shown on page 7). Any material published is subject to such editorial revision as is necessary, in our discretion, to meet the requirements of this newsletter. The opinions stated in this newsletter are those of the individual author and do not necessarily reflect those of SEABay.

**SEABay dues are only...
\$20 per year for single and \$25 per family. Please plan on attending our next meeting! See last page for topic/speaker and directions.**

SEABay Marine Aquarium/Environment Quiz #55

Quiz #55:

Hardware category:

1. What is the purpose of a bulk-head connector?
2. What is the other common name for a Protein Skimmer?

Chemical category:

3. pH is often lower in the morning and higher in the evening in a reef tank, why?
4. What is the term for the process of bacterial decomposition of organic compounds to inorganic ones called?

Fish category:

5. What could you deduce about a fish that had a lunate or crescent moon shaped tail fin?
6. Many fish have something called the lateral line, what is its purpose?

Inverts category:

7. What is the common name of the mollusk shaped like a small volcano?
8. What is a common example of a Polychaete found in reef tanks?

Misc. category:

9. What languages are normally used for scientific names of organisms?
10. What is a barrier reef?

Quiz #54 Answers:

1. What is the name of the instrument used to measure salinity by a property of light. **Refractometer – measures refractive index of light in liquid which changes with salinity.**
2. Name two common methods of producing ozone for use in aquariums. **Ionizing air by either electrical discharge or UV radiation.**

3. What is the process of converting nitrate to nitrogen based gasses called? **Denitrification.**

4. What is normally meant by buffer reserve in marine aquariums and why is it important? **The buffer reserve is the acid-neutralizing capacity of the water and helps stabilize the PH.**

5. Give at least three purposes for the slime coat found on most fish. **Protection from parasites, difficult for predator to grasp, reduce drag in water and chemical barrier.**

6. What family of fishes commonly found on reefs has the largest number of species (2000+)? **Gobiidae (gobies)**

7. What is the generic name for the symbiotic algae found in many corals and other reef invertebrates? **Zooxanthellae.**

8. Give two different examples of common orders of marine anthozoans. **Gorgonians, corals and anemones.**

9. Give the common name of the tree sometimes found along the edge of saltwater estuaries and marshes. **Mangrove.**

10. What is Batesian mimicry? **Where an innocuous species takes on the appearance of a noxious/dangerous one for protection.**

SEABay Grading scale:

1-2 questions right - OK for a beginner but you need to come to more SEABay meetings if you want to learn more.

3-4 questions right - there is potential here, I think we can help you but you need to show up at our meetings for us to do so.

5-6 questions right - not bad, but you really don't know as much as you think you do, so you best come

to more of our meetings to fix that.

7-8 questions right - consider yourself well informed so be sure to come to our meetings so we can pick your brain.

9-10 questions right - can you speak at our next SEABay meeting?

Thank You !!

SEABay would like to thank the following businesses and individuals who donated items to our fund raising events:

May 17, 2008

- ◇ **Rex Niedermeyer Member**
- ◇ **Fish, Fish and More Fish SF store**

Again, we encourage you to bring aquarium related items in good working condition (please NO junk) that you no longer have a use for to donate as raffle prizes at our general meetings and we will give you a fair valued receipt for tax purposes This helps you make more space for new "stuff" while helping SEABay to continue and

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to control the volume of the outlet with a valve and the evaporation rate of the aquarium is not constant every day.

Automatically supply of "Kalkwasser" - the "Kalkwasser" Reactor / the "Kalkwasser" Mixer

It is very comfortable and safe to use an automatically working system to dose "Kalkwasser" to the aquarium. The maintenance intervals are longer. A "Kalkwasser" Reactor or Mixer is a close tank with Calcium Hydroxide and reverse

osmosis water. A pump or stirrer will mix both substances all the time or as "Kalkwasser" is needed. If fresh reverse osmosis water is pumped into the reactor "Kalkwasser" will flow out of the system. It is important that the "Kalkwasser" is mixed regularly (minimum every 24 hours). Otherwise the Calcium Hydroxide will build a sediment layer at the bottom.

There are some systems with different methods to mix the Calcium Hydroxide on the market. All systems will work if the units are constructed well.

- pumps that mix the limewash
- stirrer mounted at the top of the reactor

- stirrer at the bottom with a magnetic coupling

The best system for dosing "Kalkwasser" is a dosing pump. But the method is expensive. So most systems work with a circulation pump. The water flow is reduced with a ball valve. If you combine the "Kalkwasser" Reactor with a level control the evaporated water will be refilled with "Kalkwasser" automatically. If the "Kalkwasser" is to be dosed only at night you can combine the level control with a simple timer. It is important that the pump that pumps the water from a reverse osmosis tank into the "Kalkwasser" Mixer is reduced with a ball valve.



Pure hard coral tanks with many rapidly growing SPS corals need high amounts of calcium, a not too low pH value and very low phosphate concentrations. All conditions will be produced by lime water. Only the carbonate hardness (alkalinity) must be produced by other means. Picture: J. Frotz.

The fresh "Kalkwasser" should be only slowly dropped into the aquarium water. Otherwise the pH will raise very fast. And if the level control does not work properly too much water will flow into the aquarium. If too much water runs through the "Kalkwasser" Reactor solid Calcium Hydroxide will flow into the aquarium possibly dangerously increasing its PH too high.

Important hints for buying a "Kalkwasser" Reactor

All systems - driven with pumps or stirrers - will work very good if the components are high quality and the unit is assembled in a professional way. Here are some things to look for if you want to buy a "Kalkwasser" Reactor:

- The **volume of Calcium Hydroxide**, the more powder in the reactor - without blocking!!! - the longer the period from one filling to the next. Per gram of Calcium Hydroxide you can produce ~ 1.4 liters of "Kalkwasser". A reactor with e.g. 100 g capacity will produce maximal 140 liters "Kalkwasser". If 1 liter per 100 liter aquarium volume will evaporate daily one filling of the reactor is good for about 28 days. But if the evaporation rate is about 5 liters per 100 liter and day the filling is only sufficient for 6 days. It is not possible to calculate the maximum filling volume from the volume of the reactor. The mixing methods are too different! You will find 5 liter reactors with a capacity from 50 g to 500 g.
- In the reactor a **definite phase** between clear "Kalkwasser" and white Calcium Hydroxide must exist. Otherwise the danger of filling Calcium Hydroxide into the aquarium is too big.
- All built in parts must be **very durable**, because the abrasion caused of Calcium Hydroxide is high.
- The reactor must be **air tight**. So CO₂ from the atmosphere is not able to destruct the "Kalkwasser".

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- If a **power loss** occurs the reactor should run again after this without problems.
- Larger models should have a ball valve to **drain** the volume of the reactor. You can maintain an empty reactor more easily than a heavy one.
- The reactor needs a **free outlet**. All components for dosing or preventing water back flow should be in the inlet. Parts in the outlet tube will calcify very fast. The outlet must have a big diameter. Otherwise the outlet tube will block very fast.
- The **top** of the reactor must be maintained very easily.
- There must be a **warning** at the "Kalkwasser" Reactor. The filling of this unit is a very strong alkaline.

SEABay's charter is to act as a forum for marine aquarists to exchange ideas and learn more about the creatures they keep and in doing so become more responsible concerning both their charges and the natural environment in which they originated. If we have fun in the process, so be it!

Contact SEABay to become a member today!

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we are sitting on our "you know whats" and so wanted to let you know what to expect through the rest of the year.

First, in Sept. we have planned a very interesting presentation from Frank Burr on how to design and setup marine systems that require minimal maintenance though achieving a more nature balance within the tank itself. If your anything like me then the weekly (or maybe even daily for some of you) maintenance on my tank is a necessary evil and anything I can do to reduce this chore would be welcomed news so I'm very interested in what Frank will have to say about this and hope many of you are too.

As many of you may be aware, the new Steinhart Aquarium will be opening this fall to much fanfare. Last year its head aquarist, Bart Sheppard, gave us a glimpse for what they had planned, in Nov he will be back to show us how its all come together which should be very exciting as the glimpses he gave us earlier were very impressive indeed. Even if you will already have seen the new Steinhart by then this will be a great opportunity to get more details and ask questions to someone that has been involved in this from the beginning.

As always, we are constantly looking for suggestions any of you might have concerning meeting activities, speakers or any other aspects of our group's operation. The easiest way of getting your suggestions heard is to attend one of our SEABay business meetings and bring these up there. Our next business meeting will be in August and notices will go out to our normal mailing list for those wishing to attend (remember you get a free lunch out of this if nothing else).

**Rod Leong, President
SEABay**

Frank Burr: Low Maintenance Marine Systems

Sept 20, 2008

Frank Burr of *Tropical Reef Oasis* and author of several books related to marine systems will give a presentation on various methods and techniques used to design Marine systems ranging from 1 to over 200 gallons, that require minimal maintenance within 6 months of initial setup. Also discussed will be livestock requirements and how they can help achieve a more balanced self-sustaining system. Sure to be a fascinating talk and not one to be missed - so see you there.

SEABay MEETING

Co-Sponsored by the city of Palo Alto

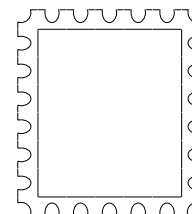
TIME: 9/20/08 @ 7:00 pm

LOCATION:

Baylands Interpretive Center
2775 Embarcadero Road
Palo Alto

- Take Hwy 101 South
- Exit Embarcadero Road (Eastbound)
- Go towards the bay past Palo Alto Airport
- At the "T", take a left
- Go past the gate and park across from the brown wooden building on the bay

SEABay



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