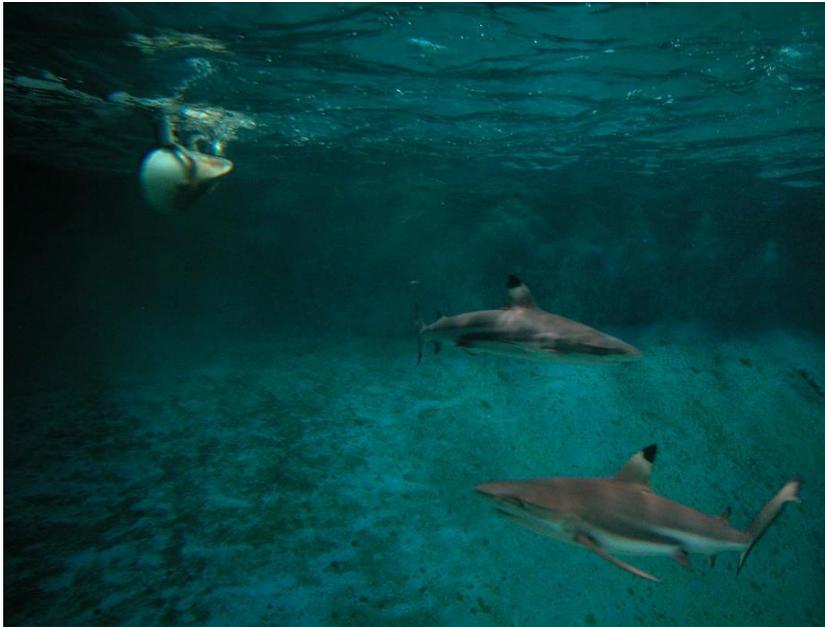


## Natural current in aquarium

Aquarium, Wilhelmshaven, Germany

"The OLOID has the advantage that there are no quiet zones"



**Aquarium Wilhelmshaven**  
Wilhelmshaven  
<http://www.aquarium-wilhelmshaven.de/navigation/start.html>

### Operation

1 seal basin 300 m<sup>3</sup> with each one  
OLOID Type 600 O/S and 400 A/S  
1 shark basin 200 m<sup>3</sup> with 2  
OLOID Type 400 A/S  
1 Amazon basin 40 m<sup>3</sup> with OLOID  
Type 200 A

### Period

Since 2002

### Success

Natural current

**Enormous energy saving**

### General information on the OLOID-technology and the materials used for seawater

The OLOID-systems are made of high-quality stainless steel. Mounting technology requires regular service. In the case of continuous operation of the equipment, a service is required every 6 months, because the salts, the fine sand, the various algae and the load of the animals produce an aggressive medium. The service is easy to carry out for trained personnel and the costs are quickly restored with the saved energy.

There is no other flow device which produces such a natural current, and at the same time offers excellent investment and operating costs. The systems have been in operation since 2002.

### Shark basin

Shark tank with 200 m<sup>3</sup> with 2 OLOID Type 400 A / S and fish: black tip shark, zebra shark, leopard streak and over one hundred swarm fish.

With 3 pumps 3 x 30 m<sup>3</sup>/h of water are feed to 3 AQUA flotors. In addition, approximately 40,000 litres of water are exchanged per week from the nearby North Sea. Energy supply for the flow in the basin 500 watts per hour, the two OLOIDs move 1,400 m<sup>3</sup>/h. The sharks have ideal natural conditions thanks to the rhythmic currents of OLOID-technology. The waves add a natural atmosphere to the water and the roughened surface creates a beautiful light. See figure above.

## Amazon basin

The 40 m<sup>3</sup> Amazon basin is only 1.6 m deep. Here an OLOID Type 200 A is used. The OLOID runs at half power, i.e. the OLOID requires only 30 watts to capture the entire basin with a flow. Otherwise the water is cleaned by means of a surface filter.

Animal-occupancy: spectacle-caiman in the company of cichlid and smolt.

## Seal basin

The basin measures 300 m<sup>3</sup> and is operated alternating with an OLOID Type 600 O/S and an OLOID Type 400 A/S. The change of the flow direction ensures that the pool remains optimally clean and the excrement is rinsed.

Here as well, water is regularly replaced by the nearby North Sea. About a quarter per month of the total volume of the basin.

The OLOIDS are equipped with a protective cage. This prevents the risk of injury without affecting the flow.

Animals: 3 seals have company of different crabs. Thanks to the good current sand covers the bottom of the basin.



Seal with oloidal wave pattern, OLOID Type 600 on the right side of the basin.

Seal in the waves generated by the OLOID Type 600.



## Interview with Mr. Hochstetter aquarium manager Wilhelmshaven

AV: Do you now operate the OLOID Type 600 in the seal pool here for the current?

Aquarium manager: So we put it here in the aquarium or in general in all aquariums once for the natural current. This is, of course, very important for the seals, that they can swim against currents, and so on. This leads, so to speak, to the enlargement of the basin when the seals can swim with the current and against the current. That is 300,000 litres and the OLOID revolves 1.4 million litres per hour of current and that makes itself already noticeable for the animals. The other is, we use the OLOID above all because of the biology. The soil in which there is a lot of organics - our soils are real sea beds, where worms, crabs and all sorts of things live - is captured by this current and the top layer in the soil is also permeated by. The OLOID has the advantage that there are no silent zones in the aquarium, even if decoration is in the way, because the water is the whole pool. When this soil is traversed, the upper layer is always enriched with oxygen. Below is an anaerobic layer and this is also good, since most of the metabolic processes occur at the interface between them. But if the oxygen zone becomes too thin and the anaerobic zone comes to the ground surface, the aquariums begin to tilt.

AV: And that could not be done with a normal agitation?

Aquarium manager: In normal flow, we are talking about a pump, which can do it, but you have to generate these gigantic currents, which means to bring in a lot of energy. The conventional pumps are mostly beam angles, so water jets which break relatively quickly, while the OLOID ensures to impulse the entire water. As a result, the flow is much wider, so it is not broken so quickly, which is the huge advantage.

AV: Nevertheless, it is so that few aquariums use the OLOID technology, what is the reason?

Aquarium manager: It is not quite so well-known, of course. It is actually a brilliant story, but you also have to know the technology. The advantage is that the engine, etc., is outside the water and what is also crucial is that the OLOID does this eighth and not a complete revolution, nothing is entangled. There are gigantic forces to circulate 1.4 million litres per hour, because you need a lot of power and of course that is on the material and it can be that after ½ year or year, depending on what else changes a service becomes necessary.

AV: ... and then you have to change a mounting or what do you do?

Aquarium manager: Because of these great forces, which act, one must immediately pay attention and do not wait. Many have always waited and then said yes, the thing is broken. Over time, you will get to know this system well and we have someone who takes care of it and does what we do in time. That is the essence.



AV: How much is the energy expenditure difference to normal technology?

Aquarium manager: It is the easiest to explain with the shark tank: we have the OLOID Type 400, which uses about 250 Watts and circulates about 800,000 litres per hour. We have other pumps in it as well, which also operate our whole technology there and which circulate 30,000 litres per hour but need almost 5 kW. If these pumps were like the OLOID at water level, they still need at least 3 kW, which means for 30,000 litres 3,000 Watt and for 800,000 litres only 250 Watt, which is extraordinary.

AV: In other words, the managing director of the aquarium is happy.

Aquarium manager: Yes, the energy savings are really enormous, but the flow is simply also much more natural. Most animals do not like directed jet of water either.

AV: That the special shark species hatched in your aquarium for the first time has this a reference point to the current of the OLOID?

Aquarium manager: So, the sharks we have just bred here are in the small pool. These are also 2,000 litres, but there is no OLOID in it.

But we bred ray, namely the Yellow stingray. These swim in our 200.000 litre shark tank around and they eat in the substrate ground worms, crabs and what else there is and the animals are 40 to 50 cm wide and the pups, which have thus 6 to 8 cm diameter. For those Yellow stingrays, we were afraid that of course the other fish will eat them, but the little ones simply take their back up, there is a poison stick, and will not be eaten. Thus we have left them in the large basin, since the flow of the soil is so good that they have developed well.

AV: This is unusual?

Aquarium manager: Yes, because this is simply a good habitat, like the natural seabed. Of course, the OLOID is crucial.

AV: I have seen that you have quite a lot of fish here in the shark tank, have you had over the 14 years of experience with the OLOID observations with other fish?

Aquarium manager: So, we have all sorts of fish, we also have an OLOID in our tropical fresh water pond where the caiman and cichlid live. We had never had any accidents there. If I have a pump with screws, the animals get quickly inside. Only with the seals, which so much like to play games, we have not dared, there we have a cage around the OLOID.

AV: Do you have other applications for the technology?

Aquarium manager: Yes, I find this much more interesting for the area of aquaculture, especially in Southeast Asia there are these shrimp breeds. Many people like to eat shrimp, which mostly come from the fresh water and the problem is, that mangroves are cut down to get the nutrients and ponds. There the shrimp are then held and the feed is thrown on the surface and then sinks very slowly to the ground. In the time when it sinks, it gets eaten, but then it is just on the ground and there it is then over and thus for the shrimp to increase sufficiently, they are constantly fed more and the feed excesses settles on the soil and contaminates the ponds bacterial. Then you have to use antibiotics again, which we eat with the shrimp and sometimes the ground is so bad that you can not hold any shrimp there again, which means again, a piece of mangrove is cut down again and again new ponds are built. This is a crazy circuit.

If I use an OLOID, I need much less to feed, because the whole thing stays in suspension. This means much less food, so you have less costs and the surplus does not settle on the ground, on the contrary are eaten away, so that the basins remain biologically stable. This would therefore be an important field of application. But it would only be possible for the OLOID Type 200, because these tanks are not so deep and you can cover the required 60 Watts even with solar.

Of course, the purchase price, has to be calculated, to date mainly tractors have used, where rods are fastened to screws, so to speak, with a propeller so that at least oxygen comes in, otherwise the shrimp also die. With the OLOID that is all no problem. But it has to happen.

AV: Thank you for the tour and the conversation.