

## SEA GROWTH

### The Problem

The cross-over and the seawater lines of existing vessels can be quite full of scaling and seagrowth in general.

Seagrowth, barnacles and shells can grow when they can hold fast to rough surfaces, like scaling.

As a result, the pipes get blocked and show reduced flow. In turn this affects for example the cooling capacity of the engines.

**In the picture you can see sea growth built up in less than one year !**



### The Set-up

The seawater lines are equipped with the Merus technology as close to the point of water intake as possible. This will mainly be the cross-over: two Merus rings, one at each side, after the seawater inlet filters. Behind the point of installation there is the cross-over pipe itself, which acts as manifold, and the various sea-water lines (e.g. going to the engines with strainers in front of them).

Another set-up can be to only equip a distinct seawater line, e.g. leading to heat exchangers.

### The Merus Technology

The Merus technology prevents or slows down new scaling, but it also loosens already existing scaling with time.

The Merus technology does not harm any biology, but with loosening the scaling, also the sea-growth gets loose and is released to the pipe. At the same time, new larvae do not find so much breeding ground any more due to cleaner pipes and the seagrowth is slowed down.

### The Monitoring

After installing the Merus rings, the Merus technology will loosen the scaling with time, and together with that the seagrowth, shells, etc. will get loose.

What we experience with the Merus technology is that scaling and seagrowth comes loose and is found or filtered somewhere along the flow line.

**The scaling is brittle and typically found in loose parts.**

Many chief engineers report to us that at that moment there is an increase of filter change and cleaning work is indispensable until the loosened parts have been flushed out and cleaned away.



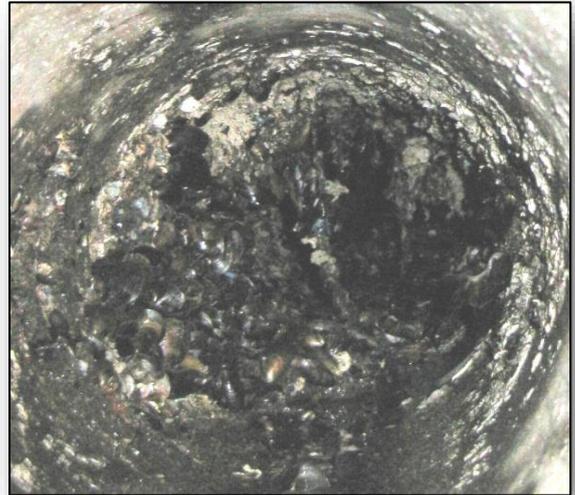
## The Challenges & The Result

Depending on the flow conditions in the system several effects can be noticed:

In case the flow is quite low, the scaling and the shells can just come to lie at a lowest point. For example in a cross-over they can lie loose at the bottom of the pipe.

Another example is when only one sea-inlet is used and the other side is closed: in this case quite a lot of scaling and shells can accumulate in the not so much used section.

With full flow (for example when sailing with full engine power and thus maximum flow), the accumulated matter goes with the flow and is then found e.g. in strainers as quite loose material.



Another possibility is that with increased flow the shells come loose from the pipes because the loosened scaling does not hold the shells so tightly any more.

**A seawater pipe on a dredger after 2 years sailing in warm waters with the Merus Technology.**

Additionally to less seagrowth in general, it was reported that the remaining barnacles were much easier to clean.