

## Major Oceanographic Research Institute Saves Labor Using Anti Bio-Fouling Film



*In the aquafarming field, the visibility of underwater cameras can be blocked by bio-fouling on optics. Nitto developed Maringlide™, a biocide-free optical clear film, offering an easy-to-use solution to Royal Netherlands Institute for Sea Research (NIOZ). By using Maringlide™ on their underwater time-lapse camera system, NIOZ could reduce labor and downtime by 30%.*

Digital cameras are commonly deployed in fish cages to continually monitor fish health and the living environment. This helps efficiently plan fish feeding and maintenance operations. They are also used in oceanographic research to assess how changes in the environment impact marine wildlife.

Because of these cameras are permanently deployed in a highly biologically active environment, marine organisms attach and grow on the lens, called bio-fouling, making it impossible for the camera to obtain clear images.

### **Conventional anti-fouling paints severely affect the image resolution**

Conventional anti-fouling paints, designed to prevent bio-fouling cannot be used for underwater camera lenses because the coating severely affects the image resolution. That leaves camera users no option but to manually clean camera lenses every one to two weeks.

NIOZ, one of the leading oceanographic research institute, wanted to find a better solution. They were investing in a lot of labor to clean their cameras – one to three hours for each lens. They wanted a solution that was practical, effective and eco-friendly for their subsea camera

Image above: Bio-fouling results on underwater time-lapse camera. Clean surface with Nitto's Maringlide optical clear film.



The Royal Netherlands Institute for Sea Research (NIOZ) is the national oceanographic institute and principally performs and promotes academically excellent multidisciplinary fundamental and frontier applied marine research addressing important scientific

and societal questions pertinent to the functioning of oceans and seas. NIOZ serves as national marine research facilitator (NMF) for The Netherlands scientific community. Learn more: [www.nioz.nl](http://www.nioz.nl)



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systems. So, they reached out to Nitto.

Based on NIOZ's requirements, the Nitto team decided to test Maringlide™. NIOZ decided to test the effectiveness of Maringlide™ on a subsea time-lapse camera used to monitor fish behavior in the shallow waters of the Dutch North Sea.

Maringlide™, was installed on the right side of the camera lens, while the left side remained unprotected (image 2). The camera would stay in the wetlands for three months with NIOZ re-



image 2

searchers evaluating the adhesive strength and the camera image resolution over time. In just one month, the recordings became dark on the left side, where the lens had remained unprotected. But on the right side, where Mar-

inglide™ had been applied, visibility remained clear.

After three months, NIOZ researchers pulled up the camera to evaluate the lens. The physical difference between the two sides were striking. A thick layer of biofouling covered the left side of the camera lens (image 3).

## Results

NIOZ was happy with the clear results of the trial. Maringlide™ completely eliminated the need for manual cleaning of lenses by

preventing the accumulation of marine organisms on the camera lens. NIOZ estimated that they were able to reduce their cleaning man-hours by 30% which helped minimize interruptions to the plankton monitoring operations.

The film also proved to be very practical as the team found it easy to apply and the adhesive kept the film in place for the entire duration of the trials. The team was also pleased that Maringlide™ is REACH, ROHS and AFS compliant.

## Summary

The ocean feeds us, helps regulate our climate, and generates half of the oxygen we breathe. It's important that we continue to research it so we can

sustain it for thousands of years to come. Using Maringlide™, NIOZ, and other marine researchers and marine aquaculture operators will be able to engage in marine research and fish farming operations while reducing labor expenses caused by cleaning bio-fouling from their subsea cameras.

Underwater cameras give us valuable insight into the unknown, and Nitto is proud to help support these efforts.



image 3



## Maringlide™

Maringlide™ is a biocide-free optical clear film with adhesive resistant to underwater static and dynamic environments. Applying anti-biofouling protection film can prevent surface damage from marine organisms such as barnacles, polychaetes, mussels, and

more, for prolonged periods. The anti-biofouling layer works by preventing organisms from attaching to the film by blocking the proteins those organisms use to adhere to surfaces.

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