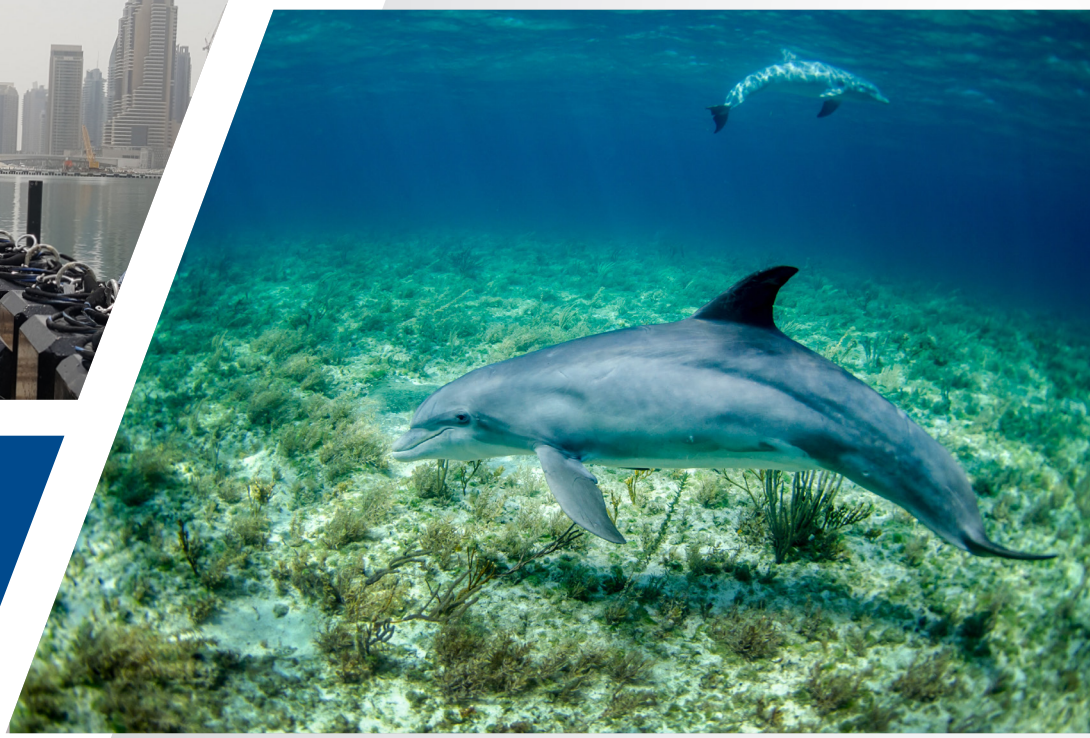
Sealite®

WHITE PAPER

Synthetic Mooring: Helping to Conserve Marine Habitats



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We believe technology improves navigation™

The Impact of Shipping on the Marine Environment

Globally, the shipping industry is relied upon for the import and export of goods across international territories.

This trade allows for countries to sustain their economies by increasing the boundaries in which they operate. It also exposes consumers to new products and markets that aren't available locally.

Shipping is heavily regulated by the International Maritime Organization (IMO) who are responsible for the safety of life at sea and the marine environment.

The IMO has drafted guidelines relating to safe mooring practice for vessels that is due to take effect in 2024.

Moorings are a necessity for the safety of the shipping industry. They must be used to effectively secure commercial vessels, recreational craft and marine Aids to Navigation (AtoN) products.

Typically, the industry uses heavy duty chain mooring affixed to an anchor or sinker that is positioned up to a few miles offshore.

The impact that moorings have and the environmental disturbance they create can be significant. Their use can impact water quality, the habitat for marine animals, and seagrasses that form part of the seabed.

Seagrass: Combating Carbon Emissions

Seagrasses are a vital part of the marine environment. In a recent blog by the CSIRO "Green superheroes of the sea (2018)", they discuss the positive impact seagrass has on the world's oceans.

Seagrass is responsible for capturing carbon dioxide (CO2) from the water they live in and storing it, usually for more than 100 years.

Interestingly, this is twice the amount of carbon that a tropical forest can store.

"The grasses of the sea hold the key to a low carbon future and are helping the planet tackle climate change," the CSIRO said.

In addition to this important discovery, seagrass provides food, habitat and a home for marine animals and marine organisms.

Marine animals use the seagrass not only for sustenance but as a sanctuary. The underwater habitat keeps them safe from larger ocean predators.

100+ Years

How long seagrass stores carbon

83,000

Tonnes of carbon / square km stored in Seagrass

A Habitat for Sea Creatures, Organisms

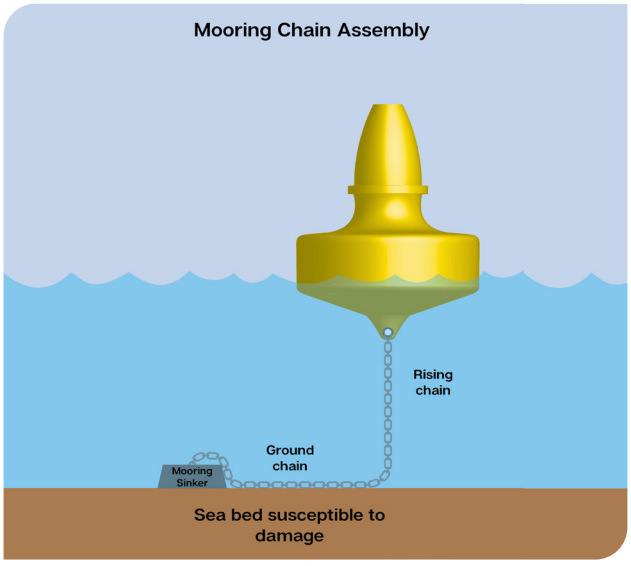
The seagrass protects these creatures from being swept away in stronger currents.

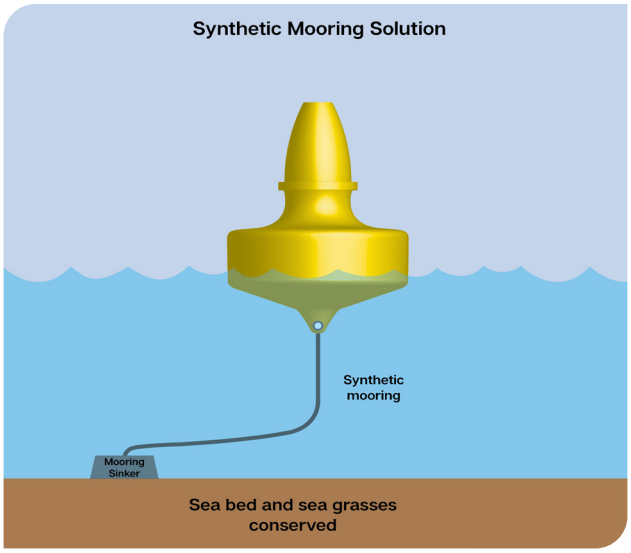
Seagrass and their dense, wide root systems are also vital to maintaining the stability of our sea beds. Their presence helps to reduce the movement of sand across the sea bottom, particularly where strong currents exist, during heavy storms or strong wave activity.

This is important because sand movement is related to accelerated erosion that affects coastline communities.

Finally, seagrass filters pollutants out of the water and traps fine particles and sediment. This helps to improve water clarity.

Bearing all this is mind, considering synthetic mooring as an alternative solution is a great way to help our marine environment.





The Impact of Traditional Chain Mooring

The impact of chain mooring on marine environments is two-fold. The first is the instance of drag and its implications on the sea bed.

When chain is used as a mooring line, it is connected to the sinker. For some distance due to its sheer weight and allowance for drag, it lies on the sea bed.

An allowance for thrashing is made during installation to allow for tidal conditions.

This is to take into consideration the rise and fall of the chain associated with current and wave activity at that particular site.

The University of Wollongong (UOW) has been working on a long-term research project into the effects of anchor and chain scour across sea floor environments.

The project is called “Dragging the Chain” and investigates the impact of ship anchoring and the use of mooring chain.

In particular its impact on the seafloor and the marine ecosystems that call it their home.

In an interview with ABC Radio, UOW Researcher, Allison Broad explains the impact of drag and the scour it leaves behind.

“As the chain moves on the seafloor, the damage can be significant with the potential to change ecosystems and reduce the biodiversity in that area,” Ms Broad said.

“Seagrass is the habitat and the nursery area for marine life. Depending on the species, it can take a very long time to regenerate,” Ms Broad added.

The second impact mooring chain has on marine environments is from corrosion. The marine industry normally uses galvanized steel as it is protected by a zinc layer.

This layer is better equipped to inhibit rust occurring. However, over time the zinc coating degrades leaving the metal exposed to the elements.

The process of wear - and therefore corrosion - occurs more rapidly in high salinity environments.

This is particularly evident with mooring chain where the natural current causes the chain links to rub against each other.

> “Seagrass is the habitat and the nursery area for marine life.”
>
> ~ Allison Broad, Researcher, University of Wollongong

This causes another problem, as the excessive wear requires ongoing monitoring and maintenance.

Failure to do so increases the risk of the mooring breaking and the buoy coming adrift.

This poses a further safety issue for mariners relying of the positioning of the buoy for navigation.

For marine animals and ecosystems, high levels of heavy metals present in the sea water can impact their health.

Commercial fisheries need to consider the quality of the seafood they source with chain mooring likely to be contributing to the issue.

The research from the UOW indicates that marine friendly mooring options are a good alternative.

From a marine industry perspective, this is also known to be the case.

Synthetic Mooring Solutions for a Sustainable Future

Sealite set out to source an alternative to traditional chain mooring. The new solution needed:

- To be able withstand the high salinity environment of the sea.
- To have an improved life expectancy.
- To be easy to maintain.
- To be environmentally sustainable.

The solution was synthetic mooring, which was released to the market in 2012.

Synthetic mooring is a much lighter environmentally sensitive alternative to traditional mooring chain, ideal for many applications.

Its neutral buoyancy means that the issues associated with drag and scouring of the seafloor is mostly eliminated, whilst still serving its purpose of anchoring to the sinker.

It allows for the seabed to be left undisturbed, and provides the opportunity for the seagrass to regenerate.

Sealite also recommends the use of a cast iron sinker instead of concrete. It has a smaller product footprint and greater durability.

The Shift to Synthetic Mooring

Eight years later, the industry is beginning to discover the benefits of using synthetic mooring.

Many customers prefer to use it over chain, or use it in combination for their installations.

While the initial commercial investment for synthetic mooring may be higher, the flow on benefits to the customer in terms of longevity, reduced maintenance and being more environmentally responsible, is significant.

They save money due to:

- A reduction in service replacement.
- Being able to commission smaller vessels due to the reduced weight of mooring.
- Reduced OH&S risk for service personnel installing and maintaining the product.
- The product being quicker and easier to handle.

It is pleasing to note the growing popularity of this type of mooring solution.

Our Online Mooring Calculator

To assist customers, Sealite has developed an easy to use, online mooring calculator.

This software takes into consideration the buoy model, water depth, mooring size, watch circle, wind speed, current, simulated mooring length and sinker mass.

It then simulates the calculation, allowing users to visualise the effect of their selections on their installation.

Sealite Synthetic Mooring has also now been accepted for use by governments, ports and harbours, consultants and Aids to Navigation service providers throughout the world.

They offer advice on mooring solutions in line with IALA recommendations.

Over fifty different types and sizes of synthetic mooring are available.

To learn about how synthetic mooring is being used in the UAE, read the case study on our website.

Minimal Maintenance

Sealite's synthetic mooring requires minimal maintenance.

The mooring offers long term longevity, reduced maintenance and is more environmentally responsible.

Sealite distributor North West Marine reports an expected life in excess of 5 years - a vast contrast to chain in the same application that needs replacement every 18 months.

Synthetic mooring is a more economical choice for many reasons.

Read the case study to find out more.

The Sealite Difference

Sealite is known in the industry for delivering what the others can't. This is the convenience of a complete packaged solution.

The business is in the unique position of being able to match aids to navigation buoys with marine lanterns, mooring, hardware and sinkers to deliver a complete packaged product.

With satellite connectivity and Star2M, the customer can then manage the solution from anywhere at any time.

For customers that require something outside of the range, bespoke products can be designed and manufactured to meet customer specific requirements.

With authorised distributors located in most countries across the globe, the support you need with local knowledge and expertise is not far away.

We are committed to the manufacture and delivery of quality products that are built to last.

About Sealite

Sealite is a global manufacturer of marine aids to navigation. The company is headquartered in Australia, with manufacturing and office locations in the United States, Singapore and the United Kingdom.

The Sealite team is dedicated to servicing the marine industry through the efficient design and production of leading-edge products.

Through close working relationships, maritime authorities and private customers around the globe now trust Sealite to enhance the safety of their operations.

For more information about Sealite, please visit our website at www.sealite.com, email us at info@sealite.com, or call us on one of the numbers below.

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All Sealite products are manufactured to exacting standards under strict quality control procedures. Sealite's commitment to research and development, investing in modern equipment and advanced manufacturing procedures has made us an industry leader. By choosing Sealite you can rest assured you have chosen the very best.

- **Experienced & Trained Personnel**
- **Worldwide Distribution Team**
- **Agile Manufacturing**
- **Product Innovation**
- **Precision Construction**
- **Total Quality Management**
- **ISO9001:2015**
- **Rapid Turnaround**

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