



# *SeaQuantum*

The ultimate fuel saver

*Optimum antifouling performance tailor-made for your vessel*



# A global provider of coatings



Jotun is one of the world's leading manufacturers of paints, coatings and powder coatings.

We have 64 companies in 45 countries and 37 production facilities in 21 countries on all continents, and are represented in over 100 countries with our network of agents, branch offices, distributors and sales offices around the world.

Our operations cover development, production, marketing, R&D and sales of paints and coatings to protect and decorate surfaces in residential, shipping and industrial markets.

Jotun is organised in four segments and seven geographical regions with its head office located in Sandefjord, Norway.

### PROTECTIVE COATINGS

Our protective coatings are protecting assets in industries such as offshore, energy, infrastructure and hydrocarbon processing.

### MARINE COATINGS

As the world's leading provider of marine coatings we supply to ship owners, management companies and others for newbuilding, seastock and dry-dock.

### POWDER COATINGS

Our powder coatings are supplied to manufacturers of appliances, furniture, building components, pipelines and general industries.

### DECORATIVE PAINTS

Our interior and exterior paints are being used by consumers and professionals worldwide, for protection and decoration.

### UNIFORM STANDARD ACROSS THE GLOBE

- Easy to exchange trained technical personnel across national borders and multi-national projects.
- Compulsory training for all technical and sales personnel in marine and protective segments. Most of our coating advisors and technical personnel have FROSIO and/or NACE certification.
- Same competence in maintaining company standard procedures globally.



### Jotun GreenSteps

#### FOR A MORE COLOURFUL WORLD, WE ALL NEED TO BE A LITTLE GREENER

Jotun recognises the responsibility it has to the environment and has established its own GreenSteps programme.

Through the GreenSteps programme we address market demand for more sustainable coatings solutions.



## BENEFIT FROM THE WORLD'S MOST ADVANCED ANTIFOULING TECHNOLOGY

SeaQuantum is based on the world's most advanced antifouling technology.

### Silyl acrylate technology

As a recognised pioneer in the use of polymer binders in marine coatings, Jotun has been working with silyl acrylate technology since the 1990s.

SeaQuantum's reliable long lasting protection is provided by a linear polishing rate and a low leached layer – ensuring a controlled release of biocides over time.

Predictable and reliable performance is extremely important for a vessel to maintain speed without an increase in fuel consumption.

### Launched in 2000

After years of development and testing, SeaQuantum was launched in 2000.

### SeaStar Alliance

In 2002, Jotun A/S and Japan's NKM formalised their co-operation by forming SeaStar Alliance which has around 25% of the global marine



market. Sharing and developing existing technology helps sharpen the competitive edge for SeaStar Alliance, enabling its partners to maintain their status as leaders in the marine market.



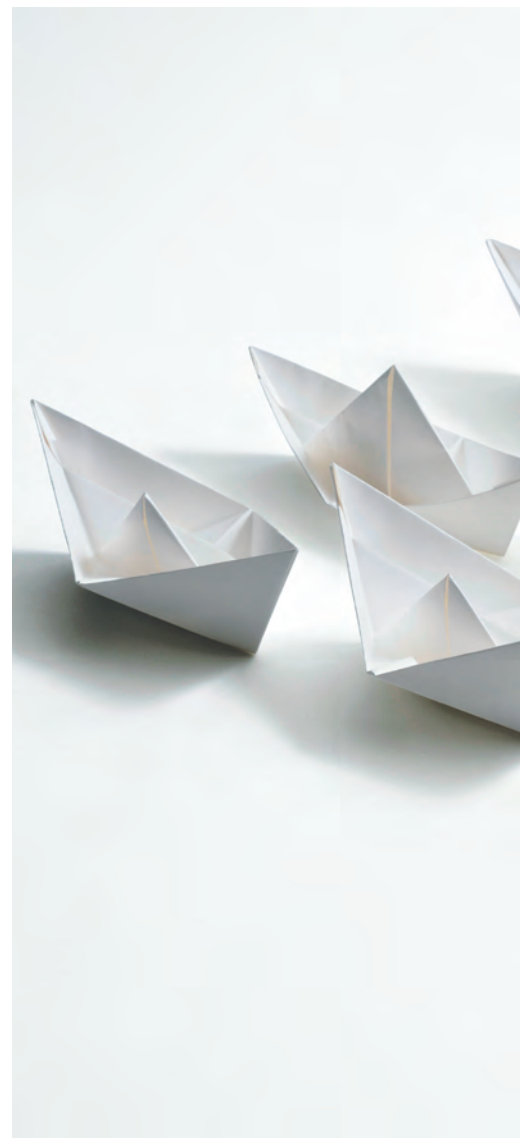
*A butterfly was chosen for the 2000 launch of SeaQuantum to represent freedom of antifouling from TBT*

### Proven innovation process

The development of silyl acrylate binders conformed to Jotun's proven innovation process. After years of development and testing, SeaQuantum was launched in 2000. The latest innovation from more than 18 years' experience came through the 3rd generation silyl acrylate technology in the SeaQuantum S-line and SeaQuantum Pro U. A further consequence of continuous focus on improvement and providing the best solution to the market was the launch of the unique SeaQuantum X200 based on silyl methacrylate in 2011.

### Applied on close to 10,000 vessels worldwide

Today, SeaQuantum products have been applied on close to 10,000 vessels worldwide, and it is widely recognised as the industry's leading silyl acrylate antifouling brand.



### Origami

*from ori meaning 'folding' and kami meaning 'paper' (kami changes to gami due to rendaku) is the traditional Japanese art of paper folding, which started in the 17th century AD at the latest and was popularised outside of Japan in the mid-1900s. It has since then evolved into a modern art form illustrated by the photographs in this brochure which also represent the close links between Jotun and NKM, our Japanese partner in SeaStar Alliance.*



### **SeaQuantum, fuel saving and the environment**

*By choosing the right antifouling solutions, fuel costs can be reduced by 15 per cent annually, with a corresponding reduction in carbon emissions of an estimated 190 million metric tonnes.*

*SeaQuantum leads the antifouling market in reducing carbon emissions.*

### **SeaQuantum – a range of proven performance options**

The current SeaQuantum range provides the very best in proven performance over the operating period – whether the vessel is static, operating at high speeds, slow steaming or for newbuilding appearance. These antifouling products incorporate the latest innovations in premium antifouling technology, based on decades of experience, providing unrivalled fuel cost savings compared to market average performance.



# MARKET TRENDS

## CHANGES IN THE MARINE MARKET INCREASE THE IMPORTANCE OF TAILOR

With the the marine market adversely affected by changes in the global economic situation, the choice of an antifouling, protection of guarantees on both hull performance and engine performance and fuel consumption, in particular, become increasingly important. To support our customers, we are tailor making solutions for the scenarios that present themselves in the market:



Fuel now represents about 60% of an average vessel's operating costs

### **Newbuilding and dry-docking challenges**

Where a vessel continues to operate at/or close to the original design speed

The condition of a ship's underwater hull surface has a substantial impact on its energy efficiency – both at the new build stage and for the vessel in operation. Around 10% of the world fleet's fuel consumption can be attributed to deterioration in hull and propeller performance. This translates into around \$30 billion in annual additional fuel cost and around 0.3% of all man-made carbon emissions.



Around 90% of vessel operators are slow steaming to reduce fuel costs

### **Slow steaming**

Where a vessel is trading at relatively low speed, much slower than the original design intention

The major negative effect of slow steaming is related to reduced polishing of, in particular, lower quality products. High quality silyl based antifouling products are less dependent on vessel movement and provide higher flexibility with regard to vessel activity and speed and are hence recommended for slow steaming vessels.

# TAILOR MADE ANTIFOULING SOLUTIONS



## Longer idle periods

Where a vessel is waiting for cargo at a port or anchorage for as long as 6 weeks or more

For lay-up and idle periods, the ability to have sufficient protection at the surface of the hull when the vessel is static is the most important aspect when choosing antifouling technology. During longer time perspectives, technical aspects such as the formation of a leached layer make the choice of antifouling technology critical. Minimal or no build-up of leached layers (i.e. SeaQuantum technology) is necessary to maintain the hull fouling free during lay-up and idle periods.



## Lay up

Where a vessel experiences longer periods of idle condition

Will this lay-up be for a short term or long term period – the so called 'hot' lay-up and 'cold' lay-up alternatives?

A 'hot' lay-up means leaving skeleton crew in place to keep all systems running on minimum power – meaning they could be redeployed very quickly. A 'cold' lay-up means shutting down the ship almost completely for an extended period. This leads to greater cost savings, but the ship will probably need dry-docking before coming back into service.

From an antifouling point of view the absolute best way to enter a lay-up situation is with a freshly painted hull directly out of a newbuilding or repair yard. Our best advice to further improve the situation is to replace the last coat with a full coat of high quality silyl based antifouling.

# UNIQUE FUEL SAVING SOLUTIONS

## A RANGE OF PRODUCTS TO MEET THE CHALLENGES OF CHANGING MARKET CONDITIONS

A SeaQuantum solution can be expected to deliver up to 15% propulsion efficiency gain as compared to a market average alternative. The pay-back period is usually less than one year. Since Jotun's Hull Performance Solutions include reliable performance measurement and a no-cure no-pay high performance guarantee, investment risk is limited when compared to typical investment alternatives.

### SeaQuantum X200

The latest development in tin-free, high performance, ultra low friction self-polishing antifouling, based on the latest development in hydrolysing silyl methacrylate copolymers.

By combining outstanding life-time performance with excellent application properties and state-of-the-art technical service, SeaQuantum X200 and our Hull Performance Solutions (HPS) is one of the most attractive investments on the market today.

### SeaQuantum S Line

A self-polishing, outstanding low friction antifouling based on 3rd generation silyl acrylate technology.

### SeaQuantum Ultra S

The ultimate fuel saver for low activity and slow steaming.

### SeaQuantum Classic S

The ultimate fuel saver for medium activity vessels.

### SeaQuantum Plus S

The ultimate fuelsaver for high speed activity vessels.

| VOYAGE FACTOR | SeaQuantum X200   | SeaQuantum Static | SeaQuantum Ultra S | SeaQuantum Classic S | SeaQuantum Plus S | SeaQuantum Pro U |
|---------------|---|-------------------|--------------------|----------------------|-------------------|------------------|
| 0 – 25%       | High performance guaranteed<br>Visit <a href="http://hps.jotun.com">hps.jotun.com</a> |                   |                    |                      |                   |                  |
| 25 – 50%      |   |                   |                    |                      |                   |                  |
| 50 – 90%      |   |                   |                    |                      |                   |                  |





**SeaQuantum offers you:**

- Environmental Advantage
- Financial Advantage
- Strategic Advantage

**SeaQuantum Static**

The ultimate fuel saver for low activity and slow to medium steaming vessels. A self-polishing outstanding low friction antifouling based on state-of-the-art silyl acrylate technology.

**SeaQuantum Pro U**

The ultimate fuel saver for universal trading vessels. A self-polishing low friction antifouling based on 3rd generation silyl acrylate technology.

| IDLE DAYS     | SeaQuantum X200   | SeaQuantum Static | SeaQuantum Ultra S | SeaQuantum Classic S | SeaQuantum Plus S | SeaQuantum Pro U |
|---------------|---|-------------------|--------------------|----------------------|-------------------|------------------|
| Up to 24 days | High performance guaranteed<br>Visit <a href="http://hps.jotun.com">hps.jotun.com</a> |                   |                    |                      |                   |                  |
| Up to 30 days |   |                   |                    |                      |                   |                  |
| 30 – 90 days  |   |                   |                    |                      |                   |                  |



# Hull Performance Solutions



Deterioration of hull and propeller performance over the dry-docking interval currently accounts for 10% of the world fleet's energy consumption.

Jotun's Hull Performance Solutions have been designed to make it easy to maximise hull performance and thereby reduce both fuel cost and greenhouse gas emissions. The solutions combine state-of-the-art antifouling and application technologies with reliable performance measurement and high performance guarantees.

## *environmental advantage*

Substantial fuel cost and GHG emissions saving

## *financial advantage*

Competitive return on investment and pay back period as compared with other eco-technology investments

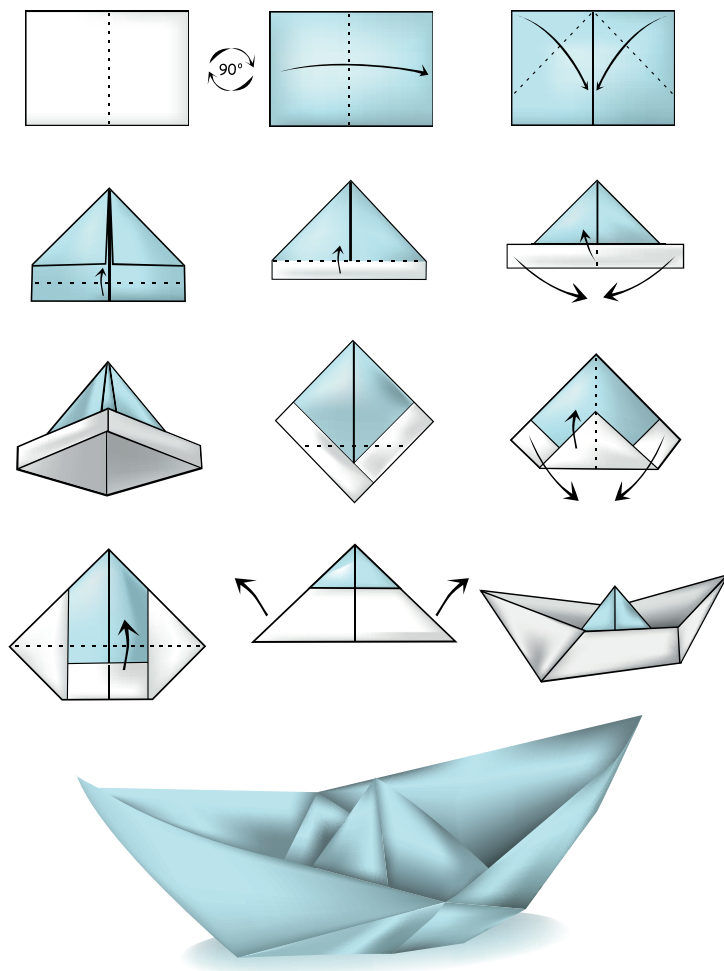
## *strategic advantage*

Low investment risk





## A guide to making your own origami ship



**SeaQuantum**  
The ultimate fuel saver

*Optimum performance tailor-made for your vessel*

# Jotun Marine Coatings and Jotun Protective Coatings offices worldwide

Legal Jotun entities worldwide are listed. For details of Branch offices and Jotun representation in countries not listed, please visit [jotun.com](http://jotun.com)

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