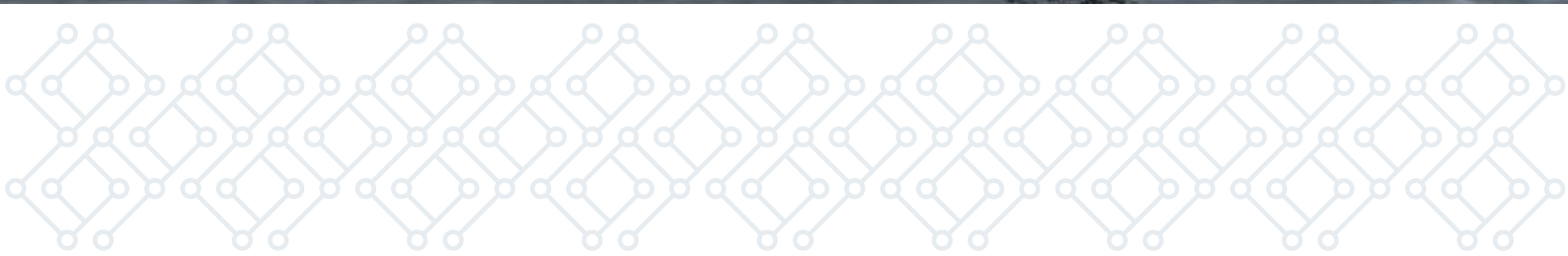
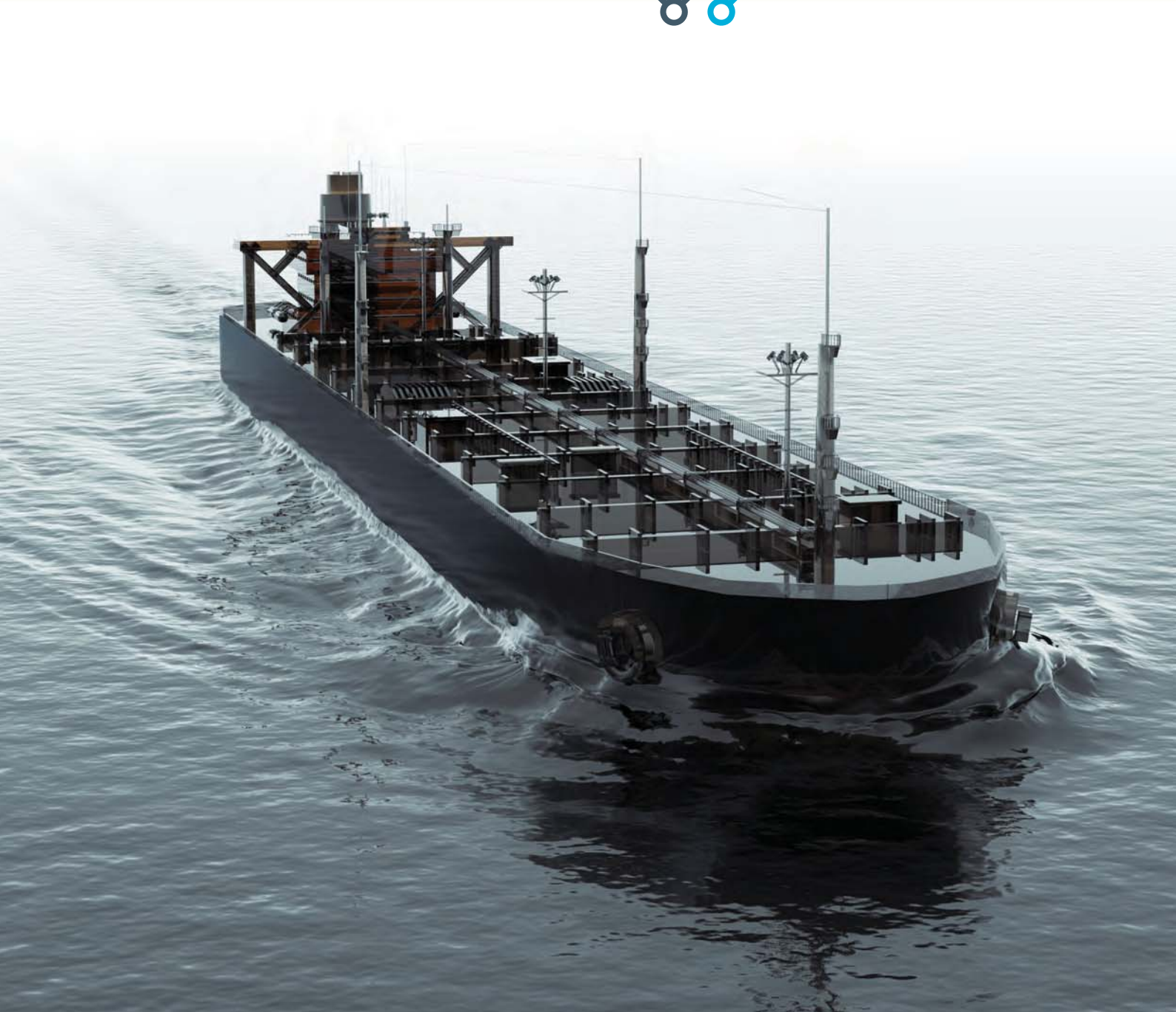
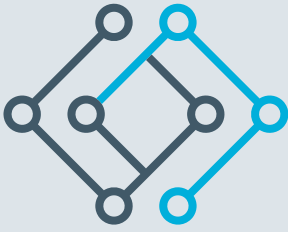


LIGHT STRUCTURES
Passion for Monitoring





LIGHT STRUCTURES

Passion for Monitoring

SENSFIB Hull™

Safe and cost-effective operation of a vessel requires exact knowledge of the ship's design and awareness of the operational risks and their consequences. One of the challenges involved has been the lack of information to the bridge about the actual loads on the hull. Historically this has been resolved relying on navigators' judgment and experience, but with Light Structures' solution it is possible to get live data via the SENSFIB Hull™ Hull Stress Monitoring solution.

By monitoring the stress responses in the hull structure during operations we can provide the navigators with online information about the load margins and provide support for the decision-making. The same data can be post-processed to give valuable input to maintenance planning and fleet utilization.

SENSFIB Hull™ benefits tankers, LNG carriers, bulk carriers, offshore ships and structures, container ships, navy and advanced hull design vessels.

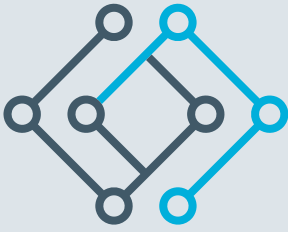
The Fiber Bragg Grating (FBG) optical sensing technology gives SENSFIB™ a competitive edge compared to the conventional strain gauges as the fiber optic technology gives more accurate monitoring and are much more cost-effective over time compared with conventional systems.



Hull Stress Monitoring – operational control

- Fiber optic technology
- Dynamic operator guidance
- Reduced maintenance cost
- Extended hull lifecycle
- Approved by leading class societies
- Improved fleet utilization
- Attractive ROI





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SENSFIB Ice™

The challenges of operating in ice infested waters affect more and more vessels as Arctic shipping routes are opening and offshore oil and gas related activities in the Arctic continue to increase.

Financially it is essential to be able to operate and utilize the vessel all year around. However ice loads that exceed the design load is a major risk for the hull structure.

SENSFIB Ice™ Load Monitoring measures the actual real time load on the hull and sends data to the bridge helping the navigator making informed decisions.

Saved data provide valuable input for maintenance planning and contributes to a safer, cleaner and more effective usage of the vessel.

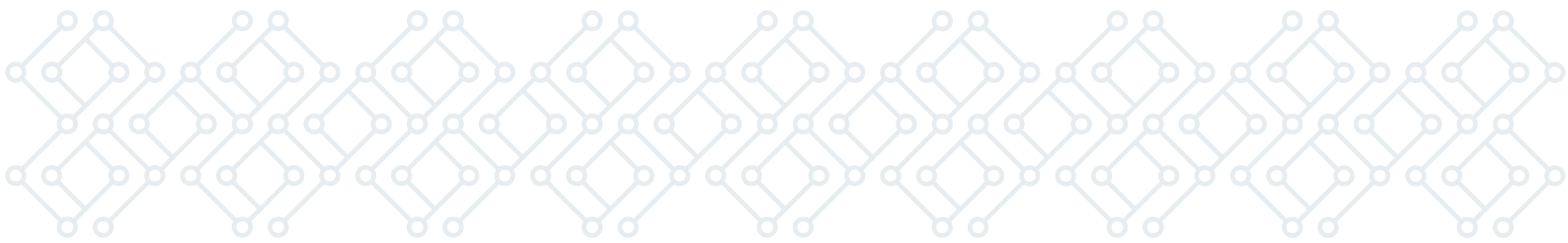


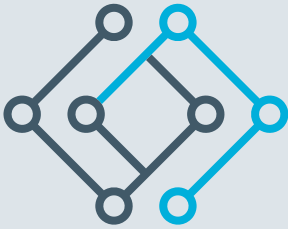
Ice Load Monitoring – operational control

SENSFIB Ice™ is the world's leading technology on ice load monitoring.

Our advanced fiber optic technology is approved by all the major classification societies and is a vital tool for the increasing number of navigators without former arctic experience who will operate these vessels in the future.

SENSFIB Ice™ can easily be retrofitted and the return on investment is attractive as the vessel can both be better utilized and the maintenance costs are kept down.





LIGHT STRUCTURES

Passion for Monitoring

Light Structures AS was founded in 2001 as a spin-off from the Norwegian Defence Research Establishment (FFI). The company is enjoying steady growth in the shipping and oil & gas markets and is today the world's leading provider of fiber optic hull stress and other structure monitoring systems. Our main office is located in Oslo and solutions are sold through a dedicated network of agents worldwide.

SENSFIB™ offers a complete suite of hull and structure condition monitoring systems with decision support functions. All sectors of the shipping and oil & gas industries will benefit from the guidance of the monitoring system.

Current SENFIB system installations include navy and coast guard vessels, large container and ro-ro vessels, shuttle tankers, FPSOs, VLCCs, LNGCs and other floaters in the oil & gas segment. Our concept is based on Fiber Bragg Grating (FBG) technology and this gives a competitive edge compared to conventional strain gauges.

Product range of SENFIB condition monitoring systems includes:

SENSFIB Hull™

SENSFIB Ice™

SENSFIB Sloshing™

SENSFIB IMMS™

SENSFIB Mooring Tension™

SENSFIB Navy™

SENSFIB Active Fatigue Management™

SENSFIB Wind™

Benefits of FBG Optical Sensing

Explosion Safety: No electric sparks in hazardous areas.

Reliability: Robust design and long-term stability.

Waterproof – no short circuits.

Accuracy: High signal precision and fast response over long distances without loss of data accuracy. Immune to electromagnetic interference.

Cost efficiency: No sensor maintenance.

Flexibility: Small size and weight.

Easy to install with adhesives.

Measure on deck or overhead, in void space or submerged in water ballast tanks.

SENSFIB™ enables you to:

- Increase safety
- Protect your ship, crew, and cargo
- Reduce risk for environmental disasters
- Optimize heading and speed by knowing weather impact in real-time
- Know the limits for safe operation
- Document and verify hull performance
- Analyze failure (black box function)
- Save costs
- Extend hull life and earning period
- Reduce unscheduled dry docking resulting from overloading damage
- Support risk-based inspection
- Improve competitiveness
- Boost public image of safety and awareness
- Receive additional classification notation to demonstrate your ship's quality and safety



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