

**LIGHT STRUCTURES**  
Passion for Monitoring

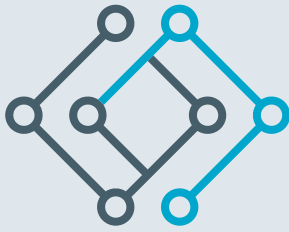


# Navy & Coast Guard

SENSFIB NAVY, SENSFIB ICE and  
SENSFIB GLOBAL FORCES

Achieve Reliability through Knowledge





## LIGHT STRUCTURES

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### SENSFIB NAVY

Navy Vessels often operate in open seas with severe wave and weather conditions. Navy vessels are also operated at high speed in semi-displacement condition. The severe effects of wave impact and whipping response on the fatigue life and ultimate strength is important to measure and handle.

The monitoring-data can be presented in real-time as an advisory system to the operator. The data is stored and post-operation analysis can be performed to have full control on the status of the hull.

SENSFIB NAVY are being more frequently used for patrol boats to monitor fatigue damage accumulation and maximum load statistics to make informed decisions for life cycle maintenance of the boats hull.

SENSFIB NAVY will enable review and evaluation of operational location and possible rotations to manage fatigue damage accumulation.

The use of onboard monitoring is a proactive approach towards lifecycle maintenance and reduces the need to replace structure during the service life. It also offers potential to extend the service life of the patrol boats, and thereby reduce the lifecycle costs significantly.

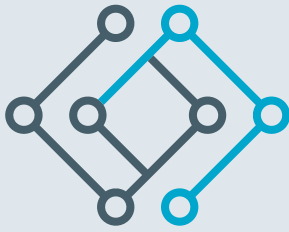
Navy and Coast Guards are increasingly pursuing a hull structure monitoring system for lifecycle maintenance on their patrol boats/semi-displacement vessels.



### Naval Hull Structural Stress Monitoring Operational Control

- Reduced maintenance cost
- Dynamic operator guidance
- No annual recalibration
- Analysis
- Fiber optic technology





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## SENSFIB ICE

The challenges of operating in ice infested waters affects more and more vessels as Arctic shipping routes are opened, and offshore oil and gas related activities in the Arctic continues to increase.

Financially it is essential to be able to operate and utilize the vessels 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 provides valuable input for maintenance planning and contributes to a safer, cleaner and more effective usage of the vessel.

SENSFIB ICE is the world's leading technology within ice load monitoring. Light Structures' 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.

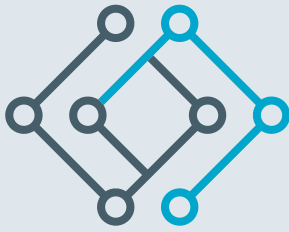
SENSFIB ICE can easily be retrofitted and the return on investment is attractive, as the vessel can be better utilized and at the same time keep the maintenance costs down.



### Fiber optic monitoring

- Fibers not responsive to external disruptions
- High reliability and stability
- Excellent long-term accuracy
- No annual recalibration required
- Flexibility in positioning:  
Small size, low weight and high IP grade





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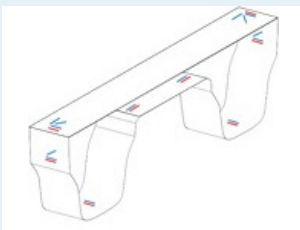
## SENSFIB GLOBAL FORCES

For complex structures such as semi-submersibles and catamarans Light Structures offer the unique SENSFIB GLOBAL FORCES system. Based on the same high-performance fiber optic monitoring solution as SENSFIB NAVY and SENSFIB ICE, the SENSFIB GLOBAL FORCES package utilizes Finite Element analysis to move from localized strains and stresses to the global moments and forces acting on the hull.

With the powerful data processing that is the core of the SENSFIB GLOBAL FORCES, system owners and naval architects have the opportunity to understand the behavior of complex structures during interaction with wind and wave patterns and compare actual loads on the structure directly with the limiting design loads.

Hard to grasp loads such as torsion and twisting are made available real-time to the user, and warning thresholds can be set. Virtual sensors can be configured to monitor the actual stress from real-life combinations of forces and moments that are not easily modelled.

SENSFIB GLOBAL FORCES can be combined with other SENSFIB systems such as SENSFIB HULL, IMMS for SENSFIB or SENSFIB COMFORT.



### Global monitoring

- Vertical bending moment
- Horizontal bending moment
- Torsion moment
- Vertical shear forces
- Horizontal shear forces
- Normal compressive force

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