Marine Life Cycle Solutions
Elomatic provides a wide range of services for Shipowners. The assignments may be specific one-off studies or comprehensive design and engineering projects and may cover any phase of the vessel’s life cycle. Our goal to create quality products and services is achieved by combining creativity with technical expertise.

Elomatic offers experienced staff in all disciplines of naval architecture, marine engineering and project management to assist in both newbuilding projects and conversions.

We also supply special services such as laser scanning, 3D modelling, exterior design, architectural design and coordination as well as various visualisation tasks.

**Concept and project design**

We identify the Shipowner’s needs and develop the ideas into feasible concepts and solutions. Our excellent naval architectural skills and advanced design tools combined with our profound knowledge of the required rules and regulations ensure the good performance of the vessel. All project materials needed for a shipbuilding contract can be produced by Elomatic. We also provide services related to bid evaluation and contract negotiations.

**Naval architecture**

- General arrangement
- Machinery arrangement
- Building specifications
- Conversion specifications
- Hull form development
- Resistance and propulsion
- Coordination of model tests
- Sea keeping and load analysis
- Noise and vibration studies
- Rules and legislation follow-up
Marine Life Cycle Solutions

Hydrostatics and stability
- Hull form and hydrostatics
- Intact stability calculations
- Damage stability calculations
- Ship weight control
- Inclining tests and stability material updates
- On board NAPA support

Safety
- Safety studies and evaluations
- Safe return to port
- Structural fire protection
- Fire safety
- Life saving appliances

Health, Safety and Environment, see www.elomatic.com

Technology and operability support
Elomatic provides sophisticated operability studies, structural and safety analyses, energy efficiency studies, and simulations to aid smooth operation and solve actual or potential problems on board. We carry out studies in various stages of a project to support the decision making process and help selecting the appropriate technologies and solutions.

Newbuilding support
Elomatic provides support for the selection of building yards and related negotiations. When a newbuilding contract has been signed we can form or take part in an on-site inspection team that takes care of plan approval and on-site supervision. We assist the shipowner with project management and coordination and after delivery we provide guarantee support and perform troubleshooting on board.
New and expected environmental regulations will have a significant impact on the world merchant fleet and require retrofitting of existing ships. Elomatic has the expertise, special competence, experience and resources to provide the key services required for the successful implementation of retrofit projects.

We focus on ballast water management, sulphur scrubbers and other exhaust gas cleaning solutions, alternative fuels such as LNG as well as energy savings in general. Our systematic retrofit approach ensures the selection of the most suitable technology, which can be integrated with existing systems and structures and installed in a cost efficient way.

Marine Life Cycle Solutions – Environmental Retrofits

**SO\textsubscript{x} and NO\textsubscript{x}**

The IMO ship pollution rules set limits for sulphur and nitrogen oxide emissions from ship exhausts. Every ship is unique and requires a comprehensive evaluation when selecting and planning the optimal solution for the reduction of SO\textsubscript{x} with scrubbers and NO\textsubscript{x} with selective catalytic reduction (SCR) plants.

**Ballast water**

Impending regulations require treatment plants to be installed on most ships around the globe. There are several technical, operational and cost considerations that have to be taken into account when choosing the right ballast water management solution.

**Alternative fuels**

Exhaust gas emissions can be reduced with alternative fuels to heavy fuel oil such as marine diesel oil or LNG. Dual fuel operation may also be an alternative.
Saving energy means reducing both costs and emissions. There is a wide range of technical and operational measures that can be introduced on existing ships in order to achieve these goals.

**Environmental services and solutions**
- Environmental maritime consultancy
- Green ship design
- Environmental technology evaluations
- Energy efficiency and optimisation
- Environmental impact assessments
- Emissions and carbon footprint calculations
- Environmental legislation follow up
- Technology retrofit projects

**Technology retrofits**
- Feasibility studies and ship inspections
- Technology evaluations and cost estimations
- As built verification using laser scanning
- Integration design and classification documentation
- Detail design and workshop drawings
- Project management and supervision

---

**Efficiency**

**Minimised off-hire**

The vessels return to service as scheduled and the implementation of plans is ensured through the management and site supervision services carried out by our experienced personnel.
Marine Life Cycle Solutions
– Information Management Solutions

To improve your ships’ operational performance Elomatic offers solutions to generate, organise and integrate technical information. We have developed a concept that combines operational management e.g. maintenance functions with document- and equipment management, supported by an easy-to-use 3D model user interface. Additional benefits are gained through improved communication and training. As part of the concept we offer qualified support for implementation and updating.

EloWise software, customisation and implementation

We build our services on purpose-built state-of-the-art software that we customise based on the particular needs of our customers. We have developed a software family to cover all the various information management requirements. The modules relevant to the application are fully integrated to form the core of our EloWise concept.

Current status audits and information management consultation

Starting with a status audit of our customer’s current information management procedures and available data we propose the optimal application of our EloWise concept including data content principles and implementation steps.
Information structure set-up and data entry services

Based on the agreed specification we create document and equipment hierarchies and databases and when possible also link the data to a computer model, panoramic 360° photos or laser scanned images. Maintenance specifications as well as spares and storage data are defined and all necessary references are generated. This data entry is made in close co-operation with the shipowner.

Data updating services

The information is easily updated and instantly available throughout the vessel’s life cycle for all relevant parties both onboard and ashore. This is valuable both during daily operations and especially in emergency situations when finding the right information quickly is crucial for decision making. Our technical information updating service ensures that technical and statutory documents, equipment data, and 3D models are kept up to date. Utilising our marine design services we can take care of the engineering of retrofits and conversions and in the meantime ensure that the data in your EloWise system is kept up to date.

Training

Safe and efficient operation requires a well-trained crew. Elomatic’s EloWise concept provides excellent possibilities to improve crew training. We also provide support in developing training programs and can conduct actual training if required.
EloWise is a modular and integrated tool for a variety of MES and PLM/SLM applications. The EloWise solution combines production information management (documents), production execution management (functions and maintenance tasks) and production facility management (equipment and material data) in an all-in-one integrated system.

The technical information is easily updated and instantly available throughout the ship’s or plant’s life cycle for all relevant parties onboard, on site and at the office. Maintenance tasks are planned and monitored, spare parts and storage are managed and relevant reports are generated. EloWise is also an excellent aid for communication and training. In order to maximise the added value of EloWise we customise the software to the particular needs of each application.

The EloWise modules complement each other to form an optimal application for each customer. The application is based on the EloWise database supported by the user interface base on which the required modules are installed.

**Easy access to information**

Searching for documents, user manuals, certificates and maintenance information can waste up to 30% of working time. By integrating the EloDoc document management system, the 3D eBrowser and a powerful equipment and material database the EloWise solution provides an excellent tool for storing and retrieving technical information relevant for operating a ship or plant. When the information is kept up-to-date significant operational savings are gained. The interlinked information can easily be obtained by exploring the hierarchy structure, by searching the database, or by browsing the 3D model.
**Reliable maintenance**

The maintenance program is defined as function specifications in the EloWise database and maintenance tasks are automatically generated from the specifications. The timing of the tasks depends on the calendar or running hours of the automation system. Spare parts and other material information as well as storage data is defined and the stock status is kept up-to-date based on input of storage events.

Manuals and drawings needed for a particular maintenance task are directly available through references in the task card. EloWise keeps track of the maintenance task status and the overall situation is shown in a dashboard view. Relevant reports and statistics can be generated as required.

EloWise EIA applications, see The Elomatic Catalogue
Conversions and retrofits

**Norsepower Rotor Sail**
Development of Rotor Sail construction and pilot installation on M/V Estraden
- Feasibility study, mechanical design of rotor and rotor components
- FEM analysis of the composite rotor, FEM analysis of rotor tower and supporting structures
- Basic and detail design for pilot installation on M/V Estraden

**Bit Viking, LNG retrofit**
LNG Pack retrofit design for chemical tanker Bit Viking. The work was done for Wärtsilä.
- Laser scanning
- Exhaust stack gas flow calculations in emergency case and burst disc solution
- LNG pipe, strength calculations, flow calculations
- 3D modelling and detail design
- Site assistance

**Selected References**

**Scrubber retrofits**
More than 20 scrubber retrofit projects for RoRo and RoPax vessels, Cruise ships and tankers.

**BWT retrofits**
- Ballast Water treatment system study for Neste oil tankers: Mastera, Tempera, Futura, Jurmo, Purha, Neste, Suula and Kiisla.
- Tanker fleet BWT technology evaluation and integration design
- Detail design for a 3700 PCC

**Crystal Symphony, refurbishment of spa area**
- Concept and detailed engineering for the interior refurbishment work
- Complete modular design of spa area

**Color SuperSpeed 2, scrubber retrofit**
Exhaust gas scrubber retrofit design for Color Line vessel Color SuperSpeed 2.
- Basic and detail design including 3D modelling
Marine Life Cycle Solutions

Contact Information

Helsinki
Henrik Bachér
Senior Vice President
Marine and Offshore
Tel. +358 10 395 7626
Mob. +358 400 444 004
henrik.bacher@elomatic.com

Antti Yrjänäinen
Senior Design Manager
Tel. +358 10 395 7601
Mob. +358 40 501 1414
antti.yrjanainen@elomatic.com

Turku
Ray Essén
Senior Vice President
Shipowners, Life Cycle Solutions
Tel. +358 2 412 4667
Mob. +358 400 784 025
ray.essen@elomatic.com

Peter Albrecht
Vice President
Shipowners, Marine Marketing
Tel. +358 2 412 4675
Mob. +358 400 201 348
peter.albrecht@elomatic.com

Marine concepts

NYK Super Eco Ship 2030
Innovative concept design of a futuristic, environmentally friendly and low emission container ship for MTI / NYK Line, Japan. Elomatic cooperated with MTI, NYK Line’s research institute and Garroni Progatti to develop the 8,000 TEU container ship that boasts a 70% reduction in CO₂ emissions.

Utopia
105,000 GT residential ship concept developed for Utopia Residences. The ship is intended for worldwide cruising with 190 ultra-luxurious estates.
- Concept development
- Stability analyses
- Full building specification

Attila
Backhoe dredger Attila for Wasa Dredging.
- Project development jointly with Wasa
- Hydrostatics and stability calculations
- Hull classification
- Basic design and outfitting design

Turva, UVL 10
Concept development of multipurpose offshore patrol vessel with functions for prevention of environmental damage, search and rescue, and different underwater assignments.
- Complete concept design for LNG application development, machinery arrangement, machinery system calculations and specification

Information management

Finnish Border Guard
EloWise was selected by the Finnish Border Guard as the maintenance and technical data administration tool for the new offshore patrol vessel TURVA built by STX Finland in Rauma as well as for the patrol vessels TURSAS and UISKO.
- The system was customised and the data structure was defined by Elomatic to fulfil the operator’s requirements
- The data entry was made in close co-operation between the operator, the yard and Elomatic
Elomatic is a leading European consulting and engineering company. Our 750 professionals work in machinery and equipment manufacturing, process, energy, offshore and marine industry projects.

We offer consulting, engineering, product development and project management services as well as products and turnkey solutions to industrial and public sector companies.

The cornerstones of our success are customers that are leaders in their respective fields and professional, customer-oriented and motivated personnel.

- Technical Consulting
- Engineering
- Project Management
- Product and Service Development
- Products & Turnkey Solutions
- Software Development
- Design Software Solutions

**Key customer segments**

- Biotech and Pharmaceuticals
- Process Industries
- Energy
- Starch and Potato Processing
- Machinery and Equipment Manufacturing
- Marine & Offshore
- Oil & Gas

**Contact information**

We operate globally and have clients in over 80 countries. Our offices are located in Finland, China, India, Italy, the Netherlands, Poland, Serbia, Russia and the UAE.

Elomatic – Headquarters
Itäinen Rantakatu 72, 20810 Turku, Finland
Tel. +358 (0)2 412 411
info@elomatic.com

www.elomatic.com