We know the Extreme

Solving global challenges with Arctic knowhow for your success

Team Arctic Finland 2019-2021
arcticfinland.fi/teamarctic
Team Arctic Finland

Our Customer Promise

- Fast track to planning ➔ One contact point
- Reduced design time ➔ Competencies with great synergies
- Maximum value ➔ Integrated, optimized and innovative solutions
Team Arctic Finland

We know the Arctic and much more

Strong experience of extreme environments brought organizations together to establish the unique **Team Arctic Finland**

- **Ideal innovation partner** for improving investment and sustainability performance in remote areas and harsh conditions

- Integrates the best engineering competencies, services, and products into and turnkey deliveries and high performing operations using the **Total Concept Approach**

- **Advanced intelligent solutions** for operation optimization (OPEX, CAPEX) and improved safety and environmental management

”The more demanding is your environment and project, the broader is your scope and need of expertise – the more often we make business together“
Team Arctic Finland

**ABB**
Improves vessel safety, energy efficiency, maneuverability and performance.

**Boskalis Terramare**
High environmental standards, including knowhow in treatment of contaminated sediments.

**DESTIA**
Creating intelligent infra solutions that enable the flow of people, goods, services, and energy as a natural part of northern life and the world economy.

**ESL Shipping**
Dry bulk carrier for the demanding northern conditions. Optimized, reliable, energy efficient and safe cargo deliveries.

**DOF Offshore Constructions**
Reliable and proven solutions in delivering structures for demanding conditions applying safe and environmentally conscious practices.

**PINJA**
Operational reliability and cost savings through hybridizations among our services for the marine industry: design and project management of electrification, automation and electric drives.

**RAUMA MARINE CONSTRUCTIONS**
Shipbuilding company specialized in the construction and maintenance of multi-purpose icebreakers, car and passenger ferries, and vessels for use by the armed forces.

**STEERPROP**
Propulsors to vessels working in the arctic, offshore and cruise industries

**VTT**
Ships and offshore structures “Extensive know-how and innovative solutions”

**coordinated by gaia**
Team Arctic Finland
Promise for quality and efficiency

EXPERIENCE  Proven know-how with several successful demanding projects in harsh condition such as the Arctic as references and much more

EFFICIENCY  Systematic engineering with operational efficiency and discipline

RELIABILITY  Reliable partner, advanced technologies and quality standards

INNOVATIVENESS  Innovation power with broad spectrum of competencies

SUSTAINABILITY  Sustainable and safe accessibility and operations in extreme conditions
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Total Concept Approach

- More value with less management efforts
- One contact point to manage the optimal network
- Optimized solutions with concrete total cost reduction opportunities
- Capacity and capabilities of tackling variety of challenges simultaneously
- Vast variety of state-of-the-art tools and solutions for sustainability
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Total Concept Approach for addressing customer needs

1. Marine logistics, fleet and special vessels
2. Offshore structures and solutions
3. Infrastructure services and solutions

Energy
Infrastructure
Mining
Shipping
Team Arctic Finland

Support throughout the project’s life cycle

Early design  Planning  Execution  Operational support
1. Marine logistics, fleet and special vessels – robustness for harsh conditions

Vessel design and manufacturing
• Concept and basic design, model testing, newbuilding construction
• Proven safety, reliability and eco-efficiency
• Advanced vessel power, equipment and solutions
• Propulsion solutions

Logistics support services
• Design and planning
• Simulation and testing
• Shipping and cargo logistics
• Maintenance services
• High quality customer service (globally)
• Data for remote monitoring

Automation solutions
• Ship and port operations automation
• Fleet management systems
• Machinery condition monitoring
• Positioning systems
2. Offshore structures and solutions

Planning, design and construction
- Floating and fixed offshore structures for harsh conditions
- High strength and durable structures

Wind modules and facilities
- Construction, installation, handling and transport of large structures on land and at sea
- Project management and control

Platform engineering
- Propulsion systems, machinery, equipment
- Ice management
- Simulation and testing
3. Infrastructure services and solutions

**Marine and port engineering and construction**
- Port location and logistics optimization
- Port engineering, design and construction
- Dredging, blasting, slipform casting
- Offshore foundations
- Special constructions, floating structures

**Other onshore construction**
- Engineering, design, EIAs and construction
- Wind farm installations
- Construction of transport routes

**Wide range of infrastructure services**
- Road and railway services
- Construction technology services
- Tailored and efficient constructions solutions
- Design, construction and life cycle solutions
- Earth and rock services
- Design services and urban development
Team Arctic Finland
For more information arcticfinland.fi/teamarctic

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Opening the Arctic with electric, digital and connected solutions

Azipod® propulsion enables economical, reliable and safe ice operation

- ABB is in a unique position to manufacture total electric power and propulsion solution for icebreaking vessels combined with digital solutions and 24/7 global service
- ABB has almost 30 years of experience with Azipod® propulsion operating in arctic conditions
- Independent and economically efficient operation in harsh ice environment can be achieved with Azipod® propulsion together with the Double Acting Ship operation principle
- Azipod® propulsion is proven to save energy and enables the use of multiple energy sources
- ABB is heavily investing in product development and is using experience from already operating arctic vessels in order to maintain the leading position in arctic operations
Azipod® propulsion key facts and figures

~90
Icebreakers or ice-going vessels

25+
Vessel types equipped with Azipod propulsion

PC2
Highest ice class on order

18,000,000+
Azipod® operational hours in total

NSR
Independent crossings of the Northern Sea route

~30
Years since first delivery
Front-runner in arctic harbour and marine construction

Services | Turn-key solutions
- Channel dredging and reclamation
- Environmental dredging
- Underwater drilling and blasting
- Port and harbour construction
- Concrete slipform casting
- Marine piling works
- Offshore foundations
- Special projects

Key figures
- Over 60 years of experience
- Personnel: 190 (2019)
- Own plant: Over 40 units

Our parent company is the globally operating Royal Boskalis Westminster N.V. The listed company operates in 90 countries on six different continents.
Nynäshamn, Sweden
Norvik Port dredging and quay wall contracts (2016-19)
Client: Ports of Stockholm

Helsinki, Finland
Pre-construction and cruise vessel quay at Hernesaari contracts (2016-18)
Client: Port of Helsinki

Hammerfest, Norway
Underwater rock blasting in Polarbase fairway (2015)
Client: Kystverket

Naantali, Finland
Jetty extension contract (2017-18)
Client: Port of Naantali
Destia – Connecting Northern life

Privately owned by Ahlström Capital Oy

High quality infrastructure solutions for the Nordic region

Road Services
Maintenance Services
Railway Services
Construction Technology Services
Earth and Rock Services
Design Services and Urban Development

Key figures 2018
- Revenues €550.3 million
- EBIT-margin 3.1 %
- Personnel on average 1,658

Destia
destia.fi
Searching for growth in Scandinavia

- Finnish infrastructure and construction service company with a history dating back more than 200 years.
- We design, build and maintain traffic routes and railways, industrial and harbour as well as urban living environments.
- Our customers comprise of industrial enterprises and businesses, municipalities, cities and government organisations.
- We actively search for opportunities to expand in Sweden and Norway with our offerings, e.g. wind and other renewable energy solutions, maintenance services, foundation engineering and transport infrastructure.
Versatile ice strengthened fleet built for the demanding conditions in Arctic and remote waters including unique 1A-ice strengthened Supramax-vessels.

Experienced crew on board and personnel ashore guarantees customers quality of service they can rely on in all conditions.

The following chart shows our recent voyages in the Arctic region, including two Northeast Passages by our newbuildings Viikki & Haaga.
• All Handy- and Supra-class vessels are equipped with cranes on board enabling independent and efficient cargo handling at ports and STS-operations at open sea.

• ESL Shipping Ltd has been in business 70 years and is a subsidiary of Aspo Plc. ESL Shipping's Board of Directors includes world-class Arctic know-how.

• Our subsidiary AtoB@C Shipping is specialist in carrying industrial products, project cargos and raw materials. Company operates several liner services around the year from Scandinavia to UK and Central Europe with ice-classed vessels in 3,000-5,000 dwt segment.

2 x 56 000 dwt, ice class 1A

3 x 20 000 dwt, ice class 1A Super

2 x 13 000 dwt, ice class 1A Super

2 x pushers, 4 x 14 000 dwt barges, ice class 1A Super

34 x 3,000-5,000 dwt, ice class 1A/1B
Outstanding turnkey project deliveries

- Extensive design and analysis capabilities of floating and fixed offshore structures intended for arctic conditions
- Expert in construction of high strength and high thickness steel materials with stringent quality requirements
- Proven quality control system in engineering, procurement, project management and construction
- Extensive track record of delivery reliability demonstrated in successful execution of world class offshore projects such as Spar hull EPC deliveries on schedule and within budget
Specific Competence and Competitive Edge on Arctic

World’s first offshore wind turbine foundation operating in heavy ice conditions

Spar hull under construction at Pori Offshore Constructions yard

R&D program of fixed offshore structures designed for arctic conditions
Marine Industry Services

• Cost-efficient solutions for vessels of different sizes with consideration of the individual needs
• Services both as a full-line supplier and as an integrator
• Pinja’s systems enable the operation of vessels more efficiently, system life cycle is under control, subsystem data are made available for remote analysis, and vessel operation can be monitored remotely

Solutions for marine and offshore projects

Newbuilds and Modernizations
Electric propulsion, power distribution and automation deliveries for both new and upgraded units

Cost Saving Solutions
Development of low-emission diesel propulsion systems and energy saving systems, as well as of hybrid systems.

Digitalization and Automation
Digital solutions for improvement of maritime transport profitability, such as vessel control applications.
Solutions to take on global sustainability challenges

- Extensive experience in propulsion and automation modernizations of all vessel types and in development of low-emission propulsion systems
- Solutions for vessel hybridizations leading to fuel economy and flexibility in operation under varying load circumstances:
  - extra power from different energy reserves without starting the generator
  - battery technologies
  - the Green Drive developed by Pinja allows reducing fuel consumption by lowering the generator RPM
- The hybrid solutions also reduce the noise emitted to the sea
Ramboll Group

fi.ramboll.com

15,500 specialists
300 offices
35 countries

Founded in 1945

Turnover €1.5 billion (2018)

Engineering, design and consultancy company

SERVICES WE PROVIDE WORLDWIDE

BUILDINGS
WATER
TRANSPORT
ENERGY AND OIL & GAS
MANAGEMENT
CONSULTING
ENVIRONMENT & HEALTH

Ramboll home market
Ramboll office
Feasibility study of the Arctic Ocean rail corridor (Finland, Norway)

Construction management of the dredging of Rauma fairway and Port of Rauma’s basin (Finland)

Umeå waste water treatment plant (Umeå, Sweden)

Collection of household waste, masterplan (Narvik, Norway)

Fakken wind farm (Karlsøy, Norway)

Technical safety study for Goliat FPSO (Barents Sea, Norway)

Biedjovaggi gold and copper mine, zoning and EIA (Norway)

Kevitsa nickel mine, ramp-up and production monitoring (Finland)

Statoil new office building (Hammerfest, Norway)

Harpa concert and conference center (Reykjavik, Iceland)
Rauma Marine Constructions, RMC, is the new beginning of an old story. The long shipbuilding traditions in Rauma form a solid base for continuing construction of high value added ships. Founded in 2014 RMC, as a Finnish maritime cluster company, started a new era for meeting both global and domestic challenges.
RMC, the shipyard in Rauma, has earned back its position as a leading yard for design and construction of special vessels, icebreakers for polar and domestic ice-covered waters, car-passenger ferries as well as naval craft for the Finnish Defence. We represent world-leading expertise in technology for these segments, i.e. areas strongly relied upon by the network, know-how and competitiveness of the Finnish marine industry.

Ship Owners’ recurring return to Rauma shipyard for a next-generation special vessel or icebreaker is most awarding for RMC. It compiles natural steps securing the development, sustainability and energy efficiency for preserving the environment.
Steerprop – the azimuth propulsion company

Steerprops brings the icebreaking endurance, excels in ice management and provides robustness to the harshest operation conditions on the Earth.

Steerprop delivers:
• Reduced lifetime costs
• Lower fuel consumption
• Short payback time
• Auxiliaries with FAT tested modular design to plug and play
• Future-proof solutions with excellent serviceability
• Steerprop Care - Condition monitoring included

Together with our partners we are able to deliver extensive scope from controls to power train propellers and thrusters.
VTT – Sustainable solutions for safe arctic operations

- Our main goal is to ensure high performance of ships, reliable and energy-efficient systems and safe sea traffic towards low-carbon and zero-emission targets
- We work in close collaboration with leading companies in arctic technologies to develop safe and sustainable solutions for arctic operations and offshore wind energy
- With VTT you gain of our multidisciplinary research in technologies applicable for arctic maritime environment
Solutions and validation for sustainable and safe arctic operations
• Towing tank
• Ship handling simulator
• Sea and ice trials
• Long term monitoring for loads and vibrations
• Fuel cell, battery, and engine research infrastructure
• Cold rooms, icing wind tunnel
• Advanced simulation methods

Customer references:
• ABB, Arctia, Aker Arctic, Lamor, Meyer Turku, Meyer Werft, NAPA, RMC, Keppel, Wärtsilä
• Technip, Siemens, Ramboll, Hochtief
• Authorities