

FINNISH SOLUTIONS FOR SAFE AND CLEAN SHIPS AND PORTS

COMBINING FINLAND'S VAST
SHIPBUILDING EXPERTISE
WITH MODERN SOLUTIONS FOR
SAFER AND CLEANER VESSELS
AND PORTS

#FINLANDWORKS

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FINNISH SOLUTIONS FOR SAFE AND CLEAN SHIPS AND PORTS

The global shipping industry is quickly adapting to the new reality of extraordinary precautions for the care and safety of crewmembers and passengers. This requires heightened levels of hygiene and cleanliness at terminals and on vessels.

Rethinking passenger flows, cabin designs and onboard experiences through innovative technology and digital solutions can ensure a comfortable and safe journey.

In this brochure, we present a world-class lineup of Finnish maritime, digitalization and healthcare offerings for both ships and ports to reinforce safety at sea.

INTRODUCING
A WORLD-CLASS
LINEUP OF
FINNISH MARITIME,
DIGITALIZATION
AND HEALTHCARE
SOLUTIONS FOR
THE ENHANCED
SAFETY OF SHIPS
AND PORTS.



WHY FINLAND?

AT THE HELM OF CREATING INNOVATIVE SOLUTIONS FOR SAFE MARITIME OPERATIONS OF THE FUTURE.

Finland is a maritime nation, often referred to as an "Arctic seafaring test bed." The Finnish maritime cluster is significant by all international standards. In addition to shipbuilding, our core competence also includes digital seafaring and environmental technologies.

We know how to put our talent to work for the overall health and safety of the maritime industry.

#1

IN DIGITAL COMPETITIVENESS IN THE EU

DIGITAL ECONOMY AND SOCIETY INDEX 2019

#1

IN AVAILABILITY OF SCIENTISTS AND ENGINEERS

WORLD ECONOMIC FORUM GLOBAL COMPETITIVE INDEX 2017-2019

#1

IN HEALTH TECH

THE LARGEST AND ONE OF THE FASTEST-GROWING EXPORT SEGMENTS OF HIGH-TECH FINNISH INDUSTRIES IN 2019

#3

IN MOST INNOVATIVE COUNTRIES

BLOOMBERG INNOVATION INDEX 2019

PUTTING OUR TALENT AND INNOVATIVENESS TO WORK FOR HEALTH AND SAFETY AT SEA AND ON LAND.



WE'RE MAKING SAILING SAFER

The companies in the Finnish Marine Industries Cluster have the experience, expertise and proven track record to bring about change when it comes to people flow, ship design and healthy hygiene practices. We're committed to making an even bigger difference for the crewmembers and passengers who wish to pursue their passion for seafaring voyages.

Finland's northern location and top-notch technology have produced some of the most exceptional vessels today, embracing digitalization for peak task performance.

For example, Finland

- Designs 60% and builds 1/3 of all the world's largest cruise ships
- Has built about 60% of the world's icebreakers
- Is currently designing 80% of all new icebreakers
- Is actively developing LNG-powered ships and fuel cell use

AUTONOMOUS OPERATIONS AND MORE

Finland is one of the leading countries in marine autonomy and a pioneer in applying AI to autonomous operations.

We have demonstrated

- The world's 1st remotely piloted passenger ferry
- The world's 1st automatic loading and unloading ship

And Finland is home to

- OneSea – the world's 1st test area for the autonomous maritime ecosystem
- The world's 1st commercial 5G test network

TRUST IS OUR #1 GOAL

Our goal for the Finnish Maritime Cluster in 2025 is to be the world's most creative, transformable and flexible network of companies engaged in maritime activities.

We aim to establish an indisputable level of confidence and trust in the maritime industry, allowing full enjoyment of life at sea to continue.

CHANGING THE WORLD WITH DIGITALIZATION

Finland is a forerunner in digitalization, enabling companies and individuals around the world to enjoy new experiences and solutions. We have a problem-solving population, with the curiosity to do things in new ways. Finland is a dedicated test bed for global solutions and a nation of early adopters.

Cross-industry digital innovation is at the core of Finnish DNA

- We brought text messaging, 5G and the Linux operating system to the world
- We are one of the few countries in the world with a national AI strategy
- We have long collected data, utilized data pools and offered digital public services

All this has been enabled by active collaboration between the public and private sectors, combined with a vibrant startup scene and innovative test beds. This environment constantly produces new technological innovations and brilliant end-user applications.

ALWAYS OPEN TO SAFETY

Finland is a trusted, safe and intelligent digital society that develops highly innovative digital solutions bolstered by tough cybersecurity. Our operating environment and legislation are solid, trustworthy and safe.

Globally celebrated, the Finnish education system drives our digital success. Here you'll find some of the best educated scientists and engineers in the world who contribute to a highly competent and productive workforce.

Digitalization leads to safer, more efficient operations, user friendliness and effective, streamlined services. By applying digital technology, we have vast opportunities to raise the level of safety throughout all areas of maritime operations to be more accurate and accountable.

CARING FOR HEALTH AND SAFETY

World-class research and technology know-how underpin the Finnish health sector, one of the most efficient healthcare systems in the world. Now, we're offering these same technologies to vessels that crisscross the oceans.

In Finland, we create, combine and enhance time- and place-independent technologies.

DEDICATED TO EXTRA- ORDINARY RESULTS

We have more R&D professionals and healthcare and digital startups per capita than any other country. Our bustling startup culture has created dynamic ecosystems that are among the largest in the world.

Thanks to our dedicated research in health and well-being, our experts are bringing a robust response to the "new normal" with extraordinary results.



RESEARCH AND EDUCATION

A”

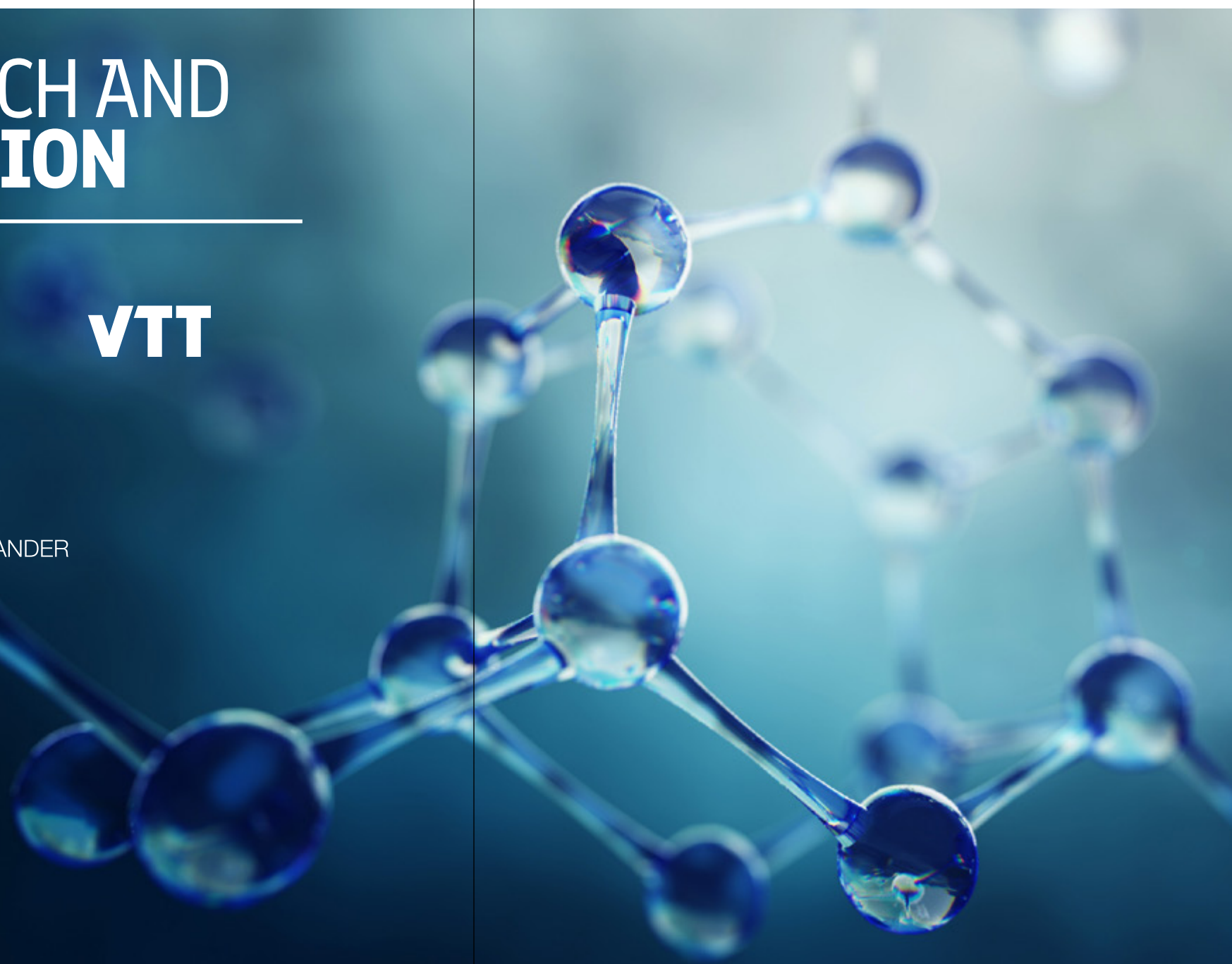
Aalto University

VTT

samk



| WANDER



VIRUS TRANSMISSION AND MITIGATION RESEARCH



Aalto University

At Aalto, there are a number of professors working in the COVID-19 task force to assess the hypothesized airborne transmission mechanism of the SARS-CoV-2 virus as small droplets via inhalation. There are also professors working on UV-light based sterilization techniques and biochemistry who can certainly contribute to this research area.

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RESILIENT BUILDINGS PROJECT



VTT's resilient buildings initiative aims to increase resiliency, preparedness for and response to outbreaks by helping identify hotspots in transportation hubs, healthcare facilities and high-density buildings and vehicles. This is where the risk of disease transmission is increased, at least temporarily.

CONNECTIVITY / 5G EVOLUTION

5G technology will significantly accelerate data transfer and open up opportunities for new digital products and services in smart ports and transport. This requires

the development of new network and service solutions, such as beyond 5G functionalities and the convergence of networks.

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INDOOR HYGIENE



Satakunta University of Applied Sciences is an experienced researcher of indoor hygiene in cooperation with national and international partners. Our goal is to break the infection chain in indoor environments and crowded public places. In addition to hand hygiene, some new and innovative solutions are needed. One area of interest is global people movement, for instance, in airports, on ships and at ports.

HYGIENE ON SHIPS

We do research on indoor environment hygiene and drinking water hygiene with actors in the marine industry, both national and international. We merge cleantech know-how, technological solutions and service concept solutions in a unique way.

DRINKING WATER QUALITY AND DISTRIBUTION NETWORK MATERIALS

We are an experienced researcher of drinking water and network materials. The quality of drinking water and the condition of network materials may affect human health. Both have financial effects also, for example, through a decreased life span of network materials. We also participate in standardization work on the national and EU level.

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WE ARE AN
EXPERIENCED
RESEARCHER IN
INDOOR HYGIENE,
DRINKING WATER
AND NETWORK
MATERIALS.

DESIGN AND BUILD

SHIPYARDS



INNOVATIVE SHIP DESIGN AND CONSULTANCY



SHIPYARDS

FOR SAFER CRUISING



HELSINKI SHIPYARD is making cruising a safe and healthy vacation alternative again. We specialize in implementing new technologies and systems into newbuildings or any of your ships in operation. New technologies help you recover your investment, reduce fuel consumption and thereby support a cleaner environment.

Early this millennium, we initiated research on various disinfection technologies for air circulation in cabins on cruise ships. With this technology, the air circulated in the ship can be 99.9% disinfected from viruses and bacteria.

New worry-free immune concepts cover every aspect of a vessel to ensure the highest sanitary standards. The freshwater and water treatment systems maintain the highest standards, and infection control is integrated into the design of the ship's systems. Medical

treatment and isolation wards fulfill the latest requirements. Catering systems and facilities are designed and made to comply with the most demanding norms. Even contact-prone surfaces are safe to touch and easy to clean, thanks to a special nanotechnological treatment.

LEGACY IN INNOVATION

Helsinki Shipyard specializes in developing demanding marine technology and building advanced special vessels. Over the decades, we have delivered more than 40 cruise ships and ferries from Helsinki.

We are known for icebreakers and other special vessels for arctic conditions, where low temperatures and low air humidity create special challenges.



REFERENCES

Project Vega: Helsinki Shipyard is currently working on two luxury expedition vessels intended to operate in the Arctic and Antarctic areas, as well as in tropical waters. Operation in the cold environment creates extreme requirements for the indoor climate. And the ice class and icebreaking capability set special requirements for the vessels.

Our new generation of polar expedition vessels fulfills all international requirements, including the Polar Code and SOLAS 2020.

Specifications:

Length – 113 m

Ice class – PC5

Capacity – 75 cabins

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WORLD-LEADING EXPERTISE



IMPROVING SAFETY AND SANITIZATION

RAUMA MARINE CONSTRUCTIONS

has always been a frontrunner in terms of technology, innovations and environmental-friendly solutions and other requirements in shipbuilding. Rauma Marine Constructions (RMC) represents world-leading expertise in technology for segments that are strongly relied upon by the network, know-how and competitiveness of the Finnish marine industry.

We are constantly finding new ways to improve the safety and sanitary aspects, among others, in the vessels together with our network and partners to fulfill the current and future needs of our customers. Together with our partners, we find the best technological solutions.

We develop ways to work safely when the ship is under construction as well as when it operates at sea with passengers and crew. We make it possible for our customers' businesses to grow in the rapidly changing, beautiful world of ours.

REFERENCES

Our newbuilding, Aurora Botnia, for Wasaline will be delivered to the operator in spring 2021. The new ferry will be the first-ever RoPax ferry with Clean Design class notation. The vessel can utilize LNG or biogas in addition to diesel fuel for power generation. It will feature a battery system and electrical azimuthing propulsion seldom implemented on car and passenger ferries.

Another RMC newbuilding, Tallink's new MyStar shuttle ferry, will be delivered to the operator in early 2022. The vessel will make use of the newest technology and innovative solutions, with the aim of building the most environmentally friendly and energy-efficient vessel possible. This includes machines that run on dual fuels and the option of a battery solution. The main fuel source is low-emission LNG.

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INNOVATIVE SHIP DESIGN AND CONSULTANCY

REDUCING THE RISK OF INFECTIONS ON SHIPS



FORESHIP is one of the leading cruise ship industry experts. We have collective experience that no other naval architect and marine engineering consultancy can match.

Based on our long-lasting expertise and that of our extensive partner network, Foreship has launched Project Hygiea, a four-step approach toward reducing the impact of coronavirus on ships. The strategy outlines processes to intercept the virus, prevent it from spreading, mitigate its impact and evacuate those in urgent need of medical care.

STEP 1: INTERCEPTION

The first step focuses on keeping the coronavirus off ships by barring passengers who have not been vaccinated or quarantined or who lack immunity. Ports will be designed for effective interception, while tests and temperature measurements are performed regularly.

STEP 2: PREVENTION

The second step involves enforcing strict measures related to hygiene and spacing, as well as providing staff training and designing spaces to minimize virus transmission.

STEP 3: MITIGATION

Mitigation is a matter of isolating the virus through decontamination, quarantining, air filtration and other measures.

STEP 4: EVACUATION

Evacuation is a last resort, but cruise operators must be able to respond if critical cases arise onboard their ships. Evacuation routes, emergency suits, capsules and craft need to be quickly and easily available.



GETTING THE CRUISE INDUSTRY UP AND RUNNING AGAIN

To help shipowners implement the approach, Foreship has formulated the Hazard and Operability (HazOp) study. As part of the HazOp process, stakeholders identify risk areas individually and convene to share their findings and develop an action plan.

With Project Hygiea, Foreship aims to get the cruise industry up and running again – in a way that prioritizes the safety of passengers, crew and the wider population.

REFERENCES

Project Hygiea: Foreship is currently working with two confidential clients regarding their services as part of Hygiea.

CONTACT

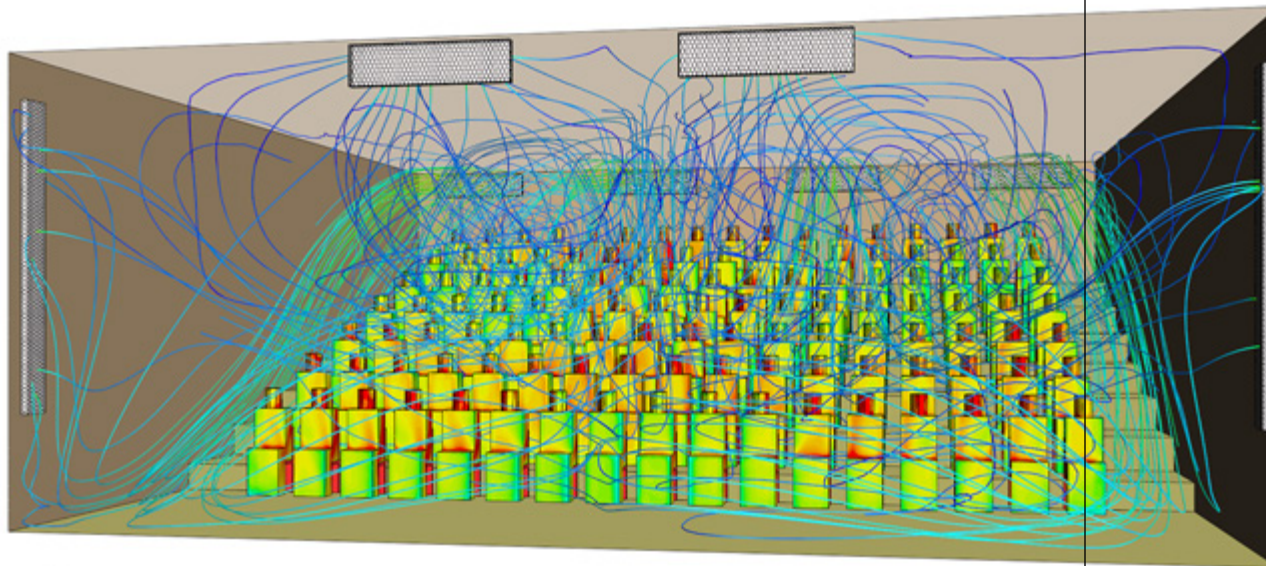
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INTELLIGENT HEALTHCARE IN SHIPPING



In the picture the audience is colored by contours of static temperature experienced, air motion is visualized by streamlines colored by velocity magnitude.

ELOMATIC provides comprehensive engineering, optimization and verification of sanitation and health safety design and processes.

The three most typical ways of contagious disease spread are air flows with infectious aerosols, touch contamination by infected persons and contaminated freshwater or provisionally stored supplements.

Freshwater system problems can be avoided by high-grade design engineering with proper materials, equipment and strict operational control.

Minimum touch contact can be achieved by adding automation, like smart elevators and motion-detection doors with specific operational rules and procedures along with the simulation-based design of optimum material and passenger flow.

PROPER VENTILATION AND AIR CONDITIONING

Safe and situation-sensitive ventilation and air conditioning need highly qualified and simulation-based design engineering with sophisticated control systems.

Ventilation and air conditioning have an impact on the time a particle spends in its domain. The time spent impacts the probability of capturing a particle. The air exchange in a domain can be simulated using computational fluid dynamics (CFD) to see the required air exchange rate needed to reduce

the particle residence time in the domain to a specific level.

Combining the design to include the optimization of the air supply and extraction units can lead to high-performance air treatment without elevating energy consumption or reducing comfort level.

A COMPREHENSIVE RESPONSE

Elomatic has long experience in cruise, passenger and special vessel designs and business operations development assignments. Additionally, we have onshore-based competences from designs of multiple cleanroom solutions for the pharmaceutical industry.

Our technical analysis teams can be used to optimize the areas in ship operations, such as HVAC solutions in particular areas, reduced manual material logistics and improved sanitation in loading and unloading operations.

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SHIP / PORT SYSTEMS AND TECHNICAL OPERATIONS

DIGITAL TECHNOLOGIES, CONNECTIVITY, CYBERSECURITY
AND CRITICAL COMMUNICATIONS

NOKIA

KNL
NETWORKS

Baseⁿ



Valmet
FORWARD

POINTR
by Delta Cygni Labs

HVAC SYSTEMS

Halton

AirD

NaavaTec

ISEC

WASTE AND GARBAGE HANDLING AND
SEWAGE SYSTEMS



Cleantech Solutions.
Anywhere.

MariMatic[®]
Member of MariGroup

Altum
TECHNOLOGIES

**DIGITAL TECHNOLOGIES, CONNECTIVITY,
CYBERSECURITY AND CRITICAL COMMUNICATIONS**

KEEPING CONNECTED AT PORTS AND TERMINALS

NOKIA



NOKIA understands that bigger vessels and tighter supply chains are increasing the pressure on ports and terminals to operate at peak productivity and efficiency. Shipping lines depend on promised productivity, while port operators need to deal with the dynamics of the maritime industry and aim to become even more cost effective.

Wireless technologies play a key role in the digital transformation of ports. Today's Wi-Fi networks are not up to the task. It is time for industrial-grade private wireless systems powered by 3GPP mobile technologies – 4.9G/LTE today and 5G tomorrow.

A GLOBAL LEADER IN WIRELESS COMMUNI- CATIONS, ADVANCED ANALYTICS AND IOT

Nokia has extensive experience in working with ports and terminals worldwide. Our industrial-grade private wireless systems deliver resilient, secure connectivity for critical communications and operational applications – with coverage that reaches every corner of the terminal.

A reliable, high-performance network provides a seamless connection between the terminal operating system and drivers and equipment anywhere in the container yard, helping increase moves per hour. Real-time situational awareness and greater visibility enhance safety across the terminal.

It is easy and more cost effective to retrofit an LTE network today that's ready for 5G tomorrow.

REFERENCES

Nokia has deployed 150+ private LTE and 5G networks worldwide of which dozens are in ports and port terminals, including customers in the following locations:

- Port of Oulu, Finland
- Port of Zeebrugge, Belgium
- Port of Hamburg, Germany

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MONITORING SANITATION AND SAFETY



KNL NETWORKS enables customers to access and collect data onboard and transmit it onshore securely.

Based on IoT technology, KNL's system creates an independent communication channel for data sharing. The channel enables the data to be securely transferred globally with extremely high reliability and easy access.

With KNL, analyzing real-time data from the vessel allows fast reactions to sanitation and safety issues on board.

SMART AND VALUABLE DATA

Accessing data is not enough. It needs to be analyzed to be valuable. By using data in a smart way, fleet operators can automatically and systematically monitor and analyze the operational quality of their vessels.

With KNL, collecting and sharing data is effortless. Gathered data

allows pushing real-time alerts to the operational staff, which helps to manage and maintain safety and sanitation operations on board. In addition, it can then be shared easily and securely, providing visibility to the vessel's state of operations.

Our connectivity solutions integrate easily into third-party applications used to monitor safety and sanitation data on the vessel. This also includes BOQA and risk management platforms.

SECURE WORLDWIDE CONNECTIVITY

With KNL's technology, controlling operational data and enforcing cybersecurity is easy. Our solution fulfills even the toughest cybersecurity requirements.

No matter where the vessel is in the world, accessing data is safe and smooth.

KNL collects data from different sources on-board the vessel. Signal amounts can range from a few hundred to thousands of signal sources. Since 2019, not a single customer data package was lost.

REFERENCES

- 100+ vessels currently sailing the globe with our technology
- Customers include the Finnish Navy, the Finnish Defence Forces, Thomas Schulte Ship Management and Lindblad Expeditions

ABOUT KNL

KNL Networks provides simple, reliable and affordable connectivity through a dedicated network trusted by governments and industrial users. We make maritime IoT connections smarter with military-grade security, the world's strongest network and easy installation.

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FOR HEALTHIER ENVIRONMENTS

Baseⁿ

BaseN enables healthier indoor and outdoor environments. With its powerful analytics, important correlations can be easily detected and alerts sent to stakeholders.

BaseN Platform collects, visualizes and displays a vast amount of data in real time. Due to our powerful analytics, important correlations are easily detected, and alerts for immediate reactions are sent to

port authorities, maintenance crews and passengers.

Whether it is the ventilation system at a terminal or on a ship, or the environmental data like temperature, humidity or CO₂ concentration of a room or open space, BaseN provides scalable data processing and long-term historical storage for mission-critical applications.

- Digital twins
- Indoor and outdoor environment monitoring
- Big data analytics
- Alerts & alarms when thresholds are crossed
- Insight for all stakeholders
- Predictive maintenance

- Terminal access control and automation
- Passenger and cargo flow monitoring and control
- Digital infrastructure management
- Workforce management and optimization



CREATING A SAFER ENVIRONMENT WITH TRANSPARENT AND ACTIONABLE INSIGHT

BaseN Platform introduces healthier and safer port and passenger ship operations for various players, such as sensor providers, ventilation unit manufacturers, shipowners or port authorities. One of the key elements of the platform is providing information at a glance and with varying depth for various stakeholders, so that everyone sees what is relevant to them.

With BaseN, a next-generation system for air quality and purity monitoring and control in closed spaces can be easily created. Threshold-crossing alarms guarantee fast actions to mitigate health risks. Also, the well-being of cruise passengers can be enhanced by automatically adjusting room temperatures and regulating air flows. From certain points of contact, such as access gates, the movement of staff and other parameters can be detected and analyzed.

ENERGY EFFICIENCY IN MARINE

Numerous companies have already used BaseN services to create smarter and healthier environments in apartments, houses, smart buildings, data centers and hospitals. In addition, BaseN serves customers in the maritime industry in energy efficiency and passenger and cargo flow applications.

REFERENCES

- Norsepower Oy Ltd
- Carbon Neutral Municipalities (HINKU) Project
- Royal VolkerWessels B.V

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SHIP HSE DATA RECORDING – QUICK AND EASY



NAPA Logbook is a PC and mobile application, which can be used from any onboard computer and smartphone device. It records, monitors and reports all of a vessel's crucial data.

To comply with the highest health, safety and environmental standards, ship operators use digital tools to record and report all ship operations.

As the world's leading provider of electronic logbooks, NAPA has more than a decade of service on board vessels.

REPORTING WITH NO HUMAN ERROR

With NAPA Logbook, different checklists can be combined with data recording, ensuring easier routines, transparency and decreased human error.

Reports can be easily generated for port officials or for further analysis ashore. With the help of a monitoring view, NAPA Logbook ensures transparent communication of any key data on board.

NAPA Logbook is also available on the new NAPA Mobile smartphone interface, allowing reporting anywhere around a ship.

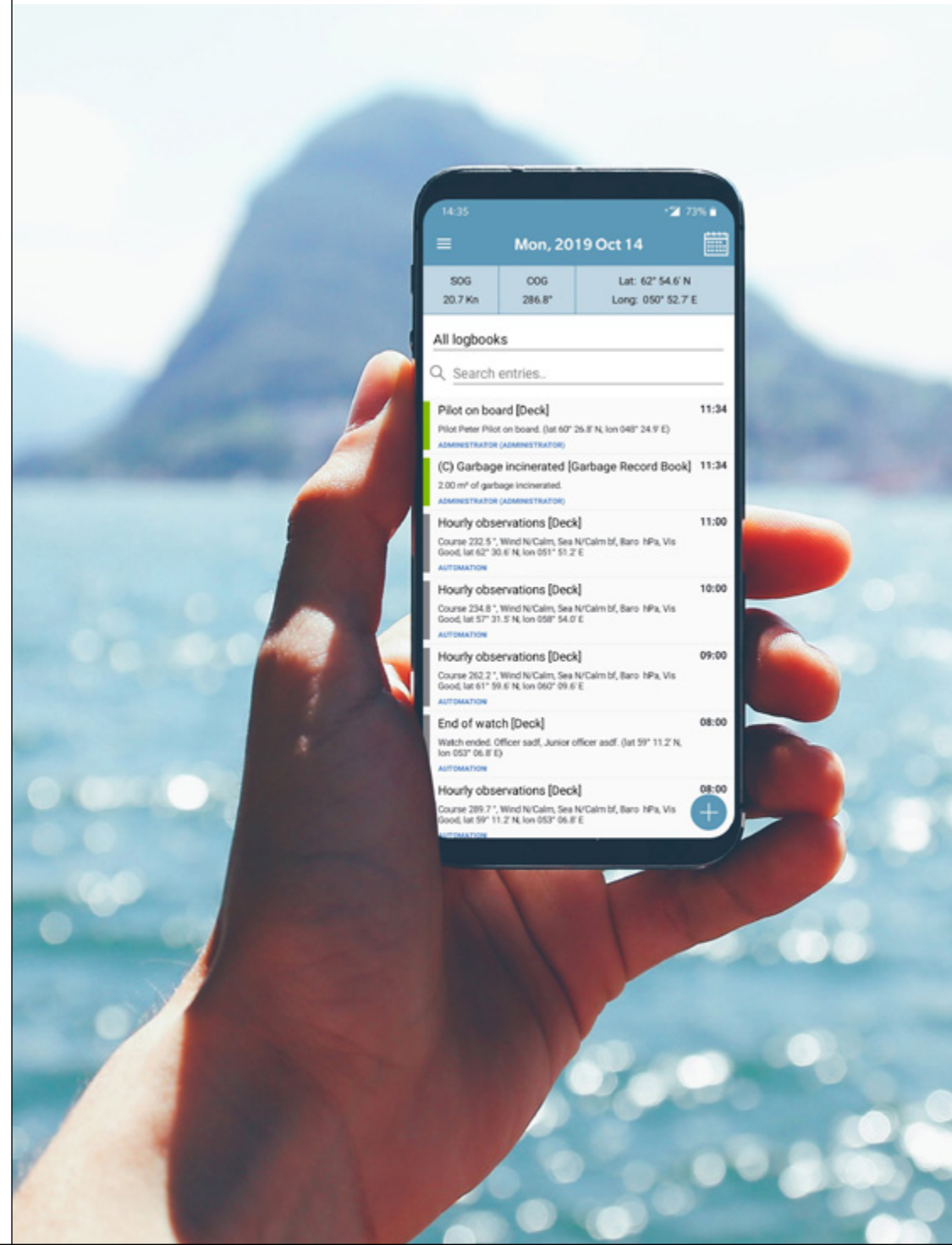
REFERENCES

Serving more than 8,000 users, NAPA Logbook is approved by over 20 major flag states, including the Bahamas, Marshall Islands, Panama, Malta and Singapore.

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THE RIGHT ONBOARD AUTOMATION



VALMET automation solutions have always focused on the importance of user experience. Starting in the 1980s, our first marine-related automation system named Damatic was invented.

Valmet DNA, our solution today, continues to add features to improve the user experience, such as alarm analyzing tools, trends and information management.

REMOTE CONNECTIONS ENHANCE OPERATION

Cruise ships, coastal vessels and special vessels like icebreakers are sailing around the world with our automation. Remote connections to the vessels are made via the owner's VPN tunnel application or via the Secomea encrypted VPN service. Our customers' shore offices and Valmet's Performance Centers can share the same information as that on board.

Due to ever-evolving new malware, ensuring a ship's automation system security can be challenging. Therefore, Valmet's cybersecurity services help shipowners easily create and maintain a constant, secure operating environment, always in line with the recommendations of DNV GL and Lloyds.

The POINTR application is available for efficient communication so that the Valmet dry dock engineer can communicate with experts and even share videos about the problems.

TIME MACHINE TRACKS FAULTS

Valmet DNA's time machine mode is an efficient tool to trace faults. It uses a combination of historical mode operator displays and trends with alarms and events.

With history data, the root cause of possible errors can be found easily. It also further educates the crew about causes and consequences.



CASE: CELEBRITY CRUISES IN THE US

Valmet has signed a service agreement with Celebrity Cruises for Valmet DNA integrated automation systems on board four Millennium-class vessels in the United States.

The service agreement will enhance the performance, safety and availability of the automation systems and continuously improve the data analytics available on board the Celebrity Cruises ships.

REFERENCES

- Celebrity Cruises – Celebrity Edge
- Royal Caribbean International – Harmony of the Seas
- Finnish Environment Institute (SYKE) – Aranda research vessel

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THE MOST SECURE VIDEO COLLABORATION

POINTR

by Delta Cygni Labs

POINTR BY DELTA CYGNI LABS is an app created for secure and reliable real-time collaboration between technicians and experts on shore.

The sea-ready POINTR remote video guidance app answers the needs of industrial use – maximum communication security and reliability combined with easy use and distribution.

In the maritime industry, human lives and enormous amounts of cargo are at risk when a fault occurs. With POINTR's live video call capabilities, accompanied by live AR markings, professionals onshore and offshore can troubleshoot and solve safety-critical problems remotely.

FROM SPACE TO OFFSHORE

POINTR is a professional remote video collaboration solution, powered by augmented reality and a unique telecommunication protocol. Having roots in space technology and in a collaboration project with the European Space Agency, POINTR technology was designed to work from the easiest repair cases to the most challenging ones. The protocol enables secure and reliable communication, even in offshore network conditions via LTE or VSAT satellite connections.



Using POINTR increases the sense of security as well as vessel security in practice in two ways. All technical issues onboard can be addressed immediately with an onshore expert, regardless of the vessel's location.

Knowing that technical support is within reach instantly increases the overall safety of all maritime traffic. This also increases the sense of security for the passengers.

HELP IN EVERY POCKET

Using POINTR is simple: download, register and use. No configuration or IT projects are needed. POINTR is easily available for Android and iOS in the app stores, and for PCs and wearables from www.pointr.it.

REFERENCES

- Wärtsilä Oyj Abp
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HVAC SYSTEMS

INDOOR AIR SOLUTIONS FOR DEMANDING SPACES

Halton

HALTON GROUP is the global technology leader in indoor air solutions for demanding environments. We develop and provide solutions for commercial and public premises, healthcare institutions and laboratories, professional kitchens and restaurants, as well as energy production environments and marine vessels.

Our mission is to provide end users with safe, comfortable and productive indoor environments that are energy efficient and comply with sustainable principles.

THE BEST INDOOR AIR FOR MARINE VESSELS

At Halton, we believe that everyone has a right to healthy indoor air. Since we spend an average of 90% of our time indoors, poor indoor

air quality can be harmful to our well-being and health.

As part of our mission, our solutions provide the best indoor air in marine vessels:

- Galley ventilation
- Cabin ventilation
- Ventilation fire safety
- Central vacuum cleaning systems
- Airflow management and air distribution

HALTON VITA SOLUTIONS FOR OPERATING ROOMS

In the healthcare market, we aim for the highest level of cleanliness, while offering safe and comfortable conditions for patients and medical staff.

Halton Vita Solutions are a low-turbulent-flow solution for ultraclean operating environments. They are designed, produced and delivered with the highest standards of safety, quality and efficiency.

MOBILE ISOLATION UNITS

Mobile isolation units include container-based single-patient isolation units with an air management system designed to improve healing conditions. They offer a quick set-up solution for fast healthcare support.

The concept varies from a single patient isolation room with an observation room, anteroom and bathroom to a cohesive mobile hospital complex with multiple modular units that can be built in various locations. The units can be easily relocated.

Each unit is equipped with an air management system, air purifier and LED lighting. The air management system is designed to maintain optimal conditions while preventing cross-contamination.

REFERENCES

Halton has over 50 years of experience in demanding indoor air solutions.

CONTACT

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SMART AND HEALTHY AIR AT SEA

AirD

AIRD specializes in smart ventilation head units for vessels. Our patented technology can be added on to a ship's existing HVAC system to provide automatic on-demand ventilation to each cabin and public area. Applicable on any type of vessel, our systems constantly monitor and control the safety of the overall air quality.

CONTROLLING AIR FLOW

Our smart AirD ventilation solution monitors air quality, air pressure and air flow, CO₂, CO, temperature and humidity. It then supplies the correct amount of fresh air everywhere on a ship as needed.

Information can be viewed on the ships and on land. Shipowners and their crew always know the status, historical data and facts about the fresh air supply and ventilation on board their ship.

With sufficient fresh air available at all times, it is possible to effectively ventilate any harmful particles or

viruses, raising the level of safety on board.

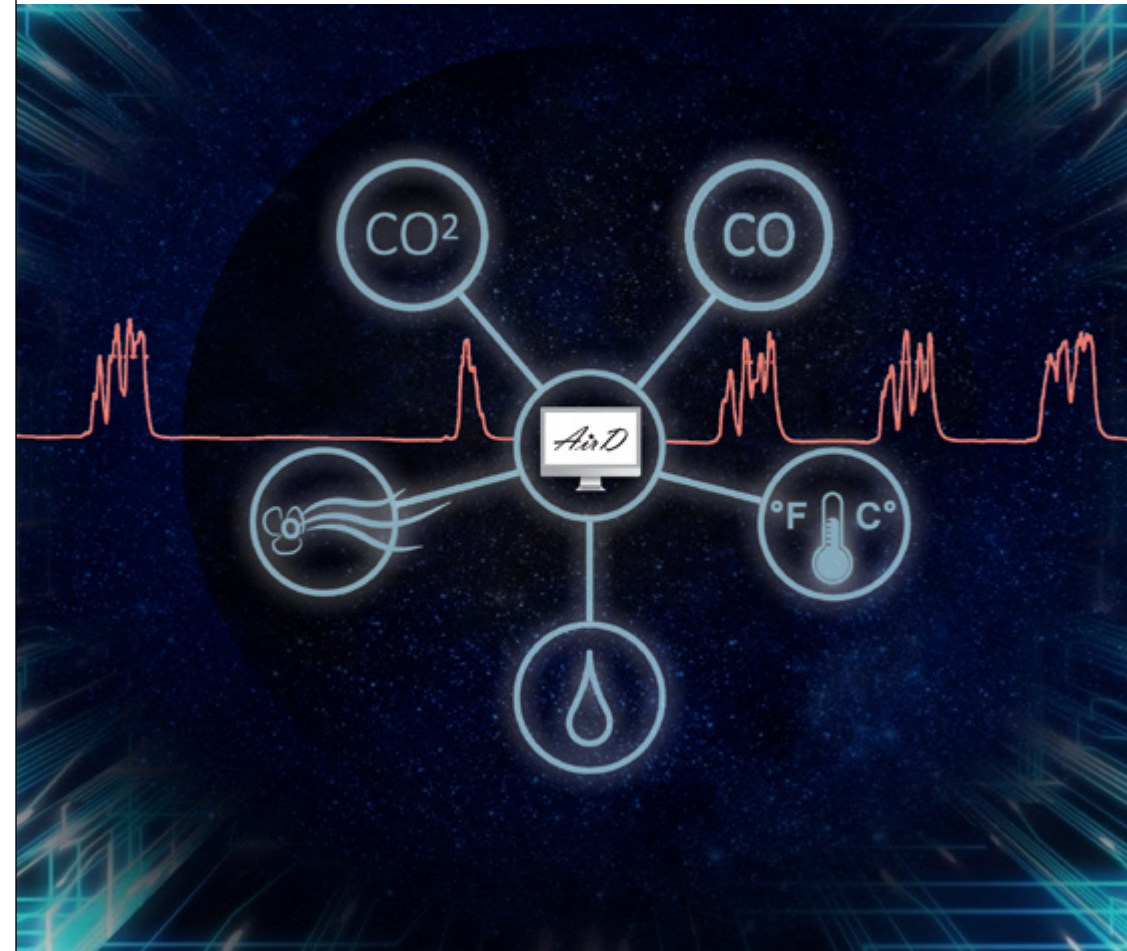
The solution operates automatically, making it easy and trouble-free to use. Air flow and pressure are easy to control. The ventilation can even be operated manually, in case of any onboard issue like an epidemic, fire or other situation.

CHEMICAL-FREE DECONTAMINATION

We have recently launched a new disinfection cabinet called AirD Blue.

This disinfection cabinet uses a new LED technology and blue light for chemical-free decontamination of any surface. The light is safe to use for humans and harmless for surfaces, equipment and even electronic devices.

The cabinet disinfects rapidly in a matter of minutes. Its blue light works effectively on mold, fungi, pathogens and even bacteria that are resistant to antibiotics.



Currently, AirD Blue Light is being tested on coronavirus to ensure its successful eradication.

REFERENCES

- Admares Modular Construction – Floating villas ventilation design
- Tallink Silja Serenade – Siljaland vent cover design

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BREATHING HEALTHY INDOOR AIR



NAAVATEC works to provide healthy indoor air. A clean and correctly functioning ventilation system is essential to maintain a comfortable, healthy and productive environment.

PRIME QUALITY VENTILATION CLEANING

Whether on cruise ships, passenger ferries or in public buildings, the more people there are, the more bacteria, dust and other contaminants are generated. The more impurities the ventilation system has to handle, the faster it gets contaminated and fails to operate as designed. To provide people with clean air, the regular cleaning and maintenance of air handling units, ductwork, fan coil units and chilled beams are vital.

ENERGY EFFICIENCY AND FIRE SAFETY

Keeping the ventilation ducts clean improves the air flow and saves energy. In case of fire, clean ductwork with no flammable dust inside helps funnel away smoke and prevents fire from spreading along the ducts.

INNOVATIVE, PRIME-QUALITY AND COST-EFFECTIVE CLEANING METHOD

The NAAVATEC Spinster™ filter system is up to fifty times more effective in collecting contaminants than standard filters. It is sealed and safe for all people around, spreading no dust or particulate matter during or after the work.

Unlike with standard filters, the method is also environmentally friendly. There's no filter waste to throw away, but only the collected contaminant. The high-capacity filter system also enables an effective lean cleaning process.

REFERENCES

- Royal Caribbean International
- Viking Line
- Finnlines
- Meyer Turku office buildings
- Municipal hospital and healthcare buildings

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INFECTION RISK MANAGEMENT

ISEC

ISEC technology used in hospitals, laboratories and military fields is now available to manage infection risks on ships and in port facilities. In case of contamination, we disinfect the premises using chemical and physical methods. One of our most important one-time methods is UVC radiation, which is very cost effective and a fast way to operate without any withdrawal period.

To protect crewmembers and passengers, we also use UV light (blue light). This method can be used continuously to disinfect cabins, door handles, food delivery points, toilets and more. Although we offer disinfection as a service, our equipment is also available for sale or rent.

HOLISTIC MANAGEMENT

When managing infection risk, it is essential to control air flows. The distribution and correct direction of air flow prevent any droplets containing viruses, microbes and exposure agents from spreading.

In addition to disinfection, we offer solutions and equipment for air purification and ventilation. Our air purifiers are manufactured in Finland. Their clean air delivery and separation grade are remarkably efficient. Depending on the need and space, they offer laminar and/or turbulent air flow.

ISEC also offers consulting. We can evaluate and recommend products, equipment and chemicals. We are pleased to participate in the design of new ships or old ship renovations, along with terminal projects. We are well-networked with research institutes and universities.



RISK ASSESSMENT

ISEC offers risk assessment as a service, which includes reviewing the existing operating models and premises. We then give proposals on the infection risks and recommended actions for cleaning and disinfection. This provides extra security, cost-effective infection risk and holistic indoor air management.

REFERENCES

- Future Hospital OYS 2030 – infection risk management and indoor air control
- Finnish Parliament House – infection risk management during recent COVID-19 pandemic
- Several large corporate clients

CONTACT

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WASTE AND GARBAGE HANDLING AND SEWAGE SYSTEMS

COMPLETE CLEANTECH ON BOARD



EVAC is a forerunner in hygienic integrated onboard systems for freshwater generation, wastewater treatment and dry and wet waste management for the marine industry.

INTERIOR SOLUTIONS WITH HIGH HYGIENE STANDARDS

From the onboard generation of freshwater to systems that ensure the highest levels of galley hygiene during food preparation, and through to wastewater treatment, Evac Complete Cleantech Solutions provide cruise ship owners and passengers with peace of mind.

Evac works with ship designers to provide integrated packages that are efficient, reliable and easy to maintain. Our equipment continues

throughout the life of the vessel during upgrades and refits to meet the latest standards.

SOLUTIONS FOR SAFE FOOD, WATER SUPPLY AND MANAGEMENT

Every passenger wants to be sure that food preparation is carried out to the most stringent standards. With Evac vacuum collection systems, food waste is whisked away to containment tanks for hygienic storage or further waste processing.

Evac desalinators turn seawater into freshwater, which is filtered, disinfected and conditioned to make it more palatable, assuring passengers of a reliable freshwater supply.



MICROBIOLOGICALLY SAFE SEWERS AND SEWAGE HANDLING SYSTEMS

We produce a number of wastewater treatment systems to meet the strictest environmental regulations of the International Maritime Organization.

The Evac membrane bioreactor (MBR) wastewater treatment system allows vessels to operate in environmentally sensitive areas, treating and discharging all wastewater generated by passengers and crew without threat to health or the environment. It is based on proven, very low-maintenance MBR technology, capable of filtering out particles as small as bacteria.

WASTE AND GARBAGE HANDLING SYSTEMS

Evac's dry and wet waste systems manage food waste, cardboard, glass, wood, aluminum and plastics in an environmentally friendly and

energy-efficient way. The solutions reduce the volume of waste through compaction, shredding and burning, all contributing to the safe and hygienic operation of the ship.

REFERENCES

Our extensive reference list includes thousands of completed projects.

- VARD – REV Ocean research and expedition vessel
- Meyer Turku – Tallink Megastar
- Chantier Naval de Marseille – Regent Seven Seas Voyager
- STX Finland (now Meyer Turku) – Oasis of the Seas and Allure of the Seas
- AIDAcara – system upgrade conducted during normal operations at sea

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HYGIENIC WASTE AND LAUNDRY TRANSPORT

MariMatic®

Member of MariGroup

MARIMATIC Taifun® and MetroTaifun® are the world-leading food waste vacuum conveying systems for food waste, sorted solid waste and linen based on pneumatic conveying systems.

With Taifun vacuum technology, food waste is centrally and automatically managed. The system is based on a strong air flow – no water is needed for conveying. The ship staff can use Taifun suction points to remove all kinds of food waste from food preparation rooms, galleys and pantries. Using its automatic cleaning-in-place (CIP) process, the system is capable of offering the highest hygiene for ships. With MetroTaifun vacuum technology, the sorted solid waste is conveyed hygienically through

a single pipeline to its individual containers in the central garbage room.

Linen conveying happens from feeding chutes close to cabin areas, sun decks and restaurants. The end destination is the ship's laundry. All this means no temporary storage of contaminated materials or waste in passenger areas or service lifts. MetroTaifun Chute 247 System has been developed for cruise ships and passenger ferries for collection and conveying of all linen and sorted solid waste directly to their end destinations without using trolleys and service lifts. Touchless, automatic chute doors ensure improved hygiene.



Taifun Hygienic central food waste collection

MetroTaifun Hygienic solid waste and laundry collection

CUSTOMER BENEFITS INCLUDE

- Hygienic food preparation rooms, ship galleys, pantries and restaurants
- Improved safety and ergonomics for the ship staff
- Savings in personnel costs related to waste transfer and cleaning
- Improved hygiene using the CIP system, which automatically sanitizes the food waste system

HIGHEST HYGIENE TO MEET REGULATIONS

A fully redundant Taifun system guarantees ultimate food safety for ships carrying 10,000 people and 30 tons of food waste per day according to the strictest demands.

Taifun systems fulfill US Public Health regulations, the highest HACCP standards and IMO MARPOL regulations. Taifun is easy to retrofit in existing ships.

MariMatic is a member of IPWCA, the International Pneumatic Solid Waste Association www.ipwca.com

REFERENCES

- Over 1,500 installed Taifun and MetroTaifun systems
- World's first food waste vacuum conveying installed on M/S Costa Atlantica in 1999
- Systems installed on cruise ships, ferries and offshore vessels
- Entertainment centers, high-rise buildings, stadiums, shopping malls and residential areas
- Technology leader with solutions and references for complete city districts

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PREVENTING BIOFOULING WITH ULTRASOUND

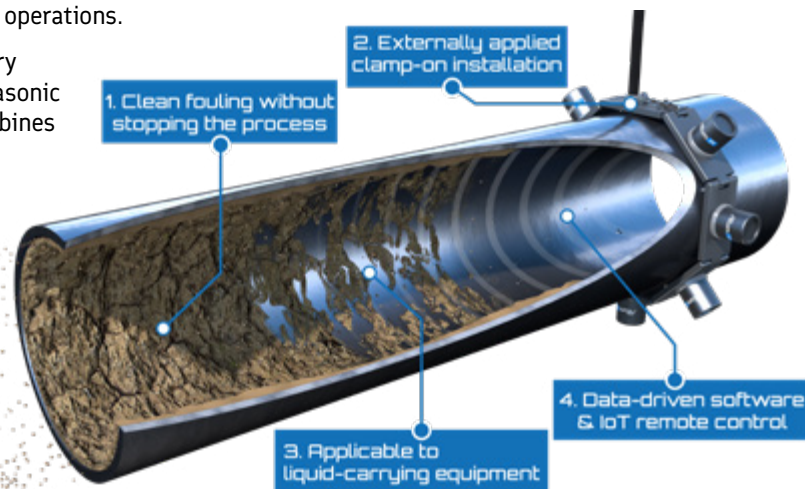


ALTUM is the only company using software-guided power ultrasound to remove and prevent biofouling in an industrial port or on vessel equipment without any production stoppages or toxic chemicals.

Altum's solution is easy to install on top of an existing pipeline or tank. The prevention system can be installed within a few days during normal ongoing operations.

Our revolutionary high-power ultrasonic technology combines traditional

ultrasonic cleaning with advanced beamforming techniques to localize and effectively clean a predefined target point. Additionally, our system is the only one in the world that can be applied externally to any existing environment without making any changes to the equipment.



THE ALTUM APPROACH

Ultrasonic cleaning uses air bubbles, known as cavitation, induced by high-frequency pressure to agitate a liquid. As the liquid is constantly "disturbed" by sound waves and microstreams are formed, the size of the air bubbles increases. And as their threshold is exceeded, the air bubbles collapse vigorously. This produces shockwaves with high forces that remove any biofouling from the surface.

WHY ALTUM?

Altum's patented and software-guided technology is based on tailored design and optimization. The technology is scalable for the cleaning demands of any industrial structures. It can be applied onsite without stopping operation.

Altum's solution is unique because it enables our customers to:

- Combine externally applied power ultrasound with the capability of focusing it on any point of the inner structure that needs cleaning
- Clean industrial equipment without the need to stop the production process
- Drastically increase production output and energy efficiency, while decreasing chemical usage

REFERENCES

Projects in sewage treatment to:

- Break biological cell structures, increasing efficiency and dry material content before entering the drum / press
- Clean and prevent blockages in pipelines
- Mitigate amount of harmful bacteria
- Increase biofuel production efficiency from the sewage

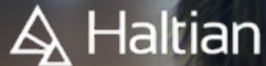
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SAFE GUEST AND CREW EXPERIENCE, PEOPLE FLOW

PASSENGER MANAGEMENT, POSITIONING, SENSORS, CONTROL SYSTEMS, SCREENING, TRACKING AND MOBILE APPLICATIONS



PASSENGER AND CREW FLOW



Dedicated to People Flow™

INTERIOR SOLUTIONS WITH HIGH HYGIENE STANDARDS TURNKEY SUPPLIERS



LIGHTING AND COMPONENTS



CATERING



FURNITURE



PASSENGER MANAGEMENT, POSITIONING, SENSORS,
CONTROL SYSTEMS, SCREENING, TRACKING AND MOBILE APPLICATIONS

EMOTIONAL EXPERIENCES AT SEA



VIBEVISION measures and analyzes emotions, which have a crucial impact on your business.

Emotions affect not only purchasing decisions, but also how satisfied and loyal your customers or employees are, as well as how willing they are to recommend your company. To put it simply, emotions affect every step of the customer and employee journey. And in these times of uncertainty, they play an even bigger role.

An emotionally connected customer is 52% more valuable than a satisfied one. Companies investing in improving the emotional experience outperform their competitors by 85%.

EMOTIONS OF THE MARINE INDUSTRY

The marine, shipping and cruise industries are full of emotions, even during “normal” times. Trust, joy, confidence and enthusiasm are the main emotions we link to the marine industry. However, COVID-19 has created new prevailing emotions linked to this industry, which include being concerned, confused and even scared.

How can we change that?

SOLUTION TO MEASURE AND ANALYZE EMOTIONS

VibeVision asks how your passengers and crew members feel and why they are feeling that way.



It is a SaaS, cloud-based, digital survey platform that functions on all interactive devices, such as mobile phones, computers, tablets and smart TVs.

TRANSFORMING EMOTIONS INTO A DIGITAL FORM

VibeVision has a solid scientific background. It was developed together with universities to meet the needs of companies to better understand their customers and employees.

We transform the emotional data into a digital form that is easy to use and understand. The data is also easy to integrate with other company KPIs. The results can be reviewed anytime online.

In addition, we offer a comprehensive data analysis as well as a guideline for the next steps.

REFERENCES

VibeVision has projects in health-care, banking, financing, marketing, media, insurance, telecommunication, event management and the heavy machinery industries.

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OPTIMIZED CLEANING ON BOARD



HALTIAN has developed an IoT solution to provide real-time information for optimized cleaning operations. Optimizing processes and improving operating efficiency are constant challenges for any facility management team.

Our solution optimizes the workload of cleaning personnel, and the time spent on actual cleaning chores is increased for better customer satisfaction. As a result, a good hygiene level and facility infection control are continuously met.

DATA-BASED CLEANING TO FIGHT VIRUSES AND BACTERIA

The spread of viruses and bacteria can be slowed down with good hygiene. However, cleaning is labor intensive with large distances between cleaning areas and unpredictable needs for supplies and maintenance.

Haltian's solution is based on smart sensors placed in washrooms to measure the consumption of supplies in dispensers and keep track of the facility usage with people counters. Cleaners use apps that inform them about cleaning and dispenser refill requirements, optimizing the cleaning route considerably.

As a result, our customers have enough supplies to maintain good hand hygiene, washroom supplies are optimized, and cleaning activities can be directed to high-traffic areas.

COST-EFFECTIVE DATA-BASED CLEANING

Our Thingsee smart washroom solution is easy to install, retrofittable and cost effective. Installing our IoT devices and setting the system up can be done in minutes. The solution works with the majority of paper and towel dispensers available on the market.

Our solutions are easy to scale, from small pilots to millions of devices, and the costs are always easy to predict.

REFERENCES

- Lindström Group – FlowAbility Washroom with Haltian's Thingsee IoT sensors

Lindström is on its way to installing over 130,000 Haltian's sensors in their existing hand towel network. The solution saves time and money, as well as increases customer satisfaction and cleaning efficiency.

CONTACT

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CRITICAL COMMUNICATIONS PLATFORM



SECAPP, the SaaS-based critical communications platform, has tools for broadcasting large-scale emergency alerts and notifications to vital stakeholders and teams in a matter of seconds. Alerting is done through different communication channels, making sure that needed individuals are reached.

In crisis situations, every extra second that is spent reacting to the alert or sharing critical information can mean more extensive damage to assets and businesses, more severe safety issues or higher loss of production.

HEALTH, SAFETY AND QUALITY ALERTS AND REPORTS

The Secapp system collects and reports vital information, such as the number of outbreak patients, safety incidents, adequacy of protective gear and personnel condition. The tool handles real-time communication through secure chat and videos.

Secapp is offered as a managed secure communications service and does not require any new devices or equipment. It allows communications utilizing existing devices, including smartphones, basic phones, computers and TETRA devices.

Secapp can be taken into use within just one day. All you need is a list of people that should have access to the system and a two-hour online training session for dispatchers and admins.

REFERENCES

Secapp is currently used by over 70,000 end users from more than 600 professional organizations covering private, public and authority sectors. All major hospitals and districts in Finland covering 12,000 healthcare professionals use Secapp daily to help save human lives.

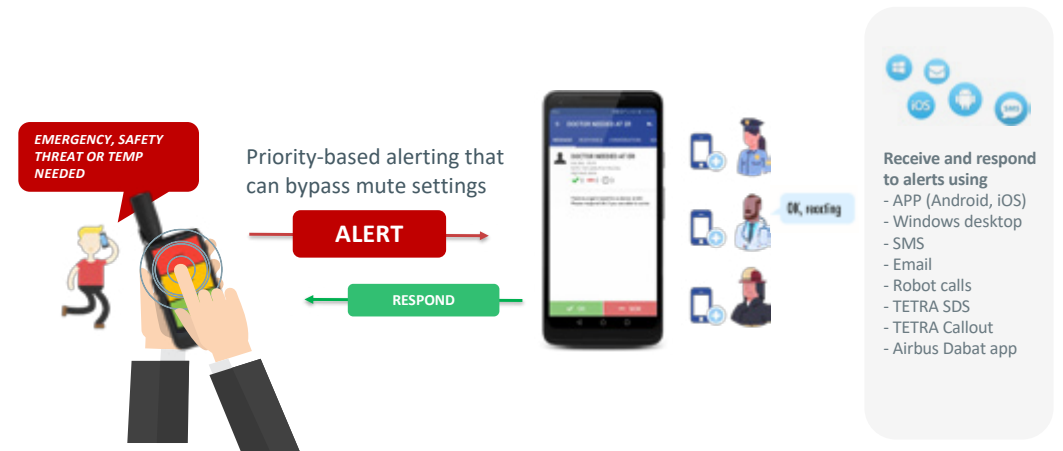
In addition, critical infrastructure organizations, such as the Port of Hanko, utilize Secapp to prepare for, manage and recuperate from critical situations, such as natural disasters, accidents and service outages, or simply make finding and contacting the right people and stakeholders for urgent tasks faster and easier than ever before.

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Oneclick alerting



AN APP FOR HEALTH AND SAFETY

wellmo

WELLMO The Wellmo-powered passenger app allows cruise operators to assemble an integrated set of services and content to rebuild customer confidence in the safety of cruising and effectively manage health and safety at sea. The app can be provided as an extension to an existing cruise operator's app. Wellmo adds significant capabilities in content publishing, personalization and use of health data.

REESTABLISHING CONFIDENCE

When passengers book a holiday, they are encouraged or required to use the app as instructed before and during the cruise. The app provides a channel to report and monitor their health status.

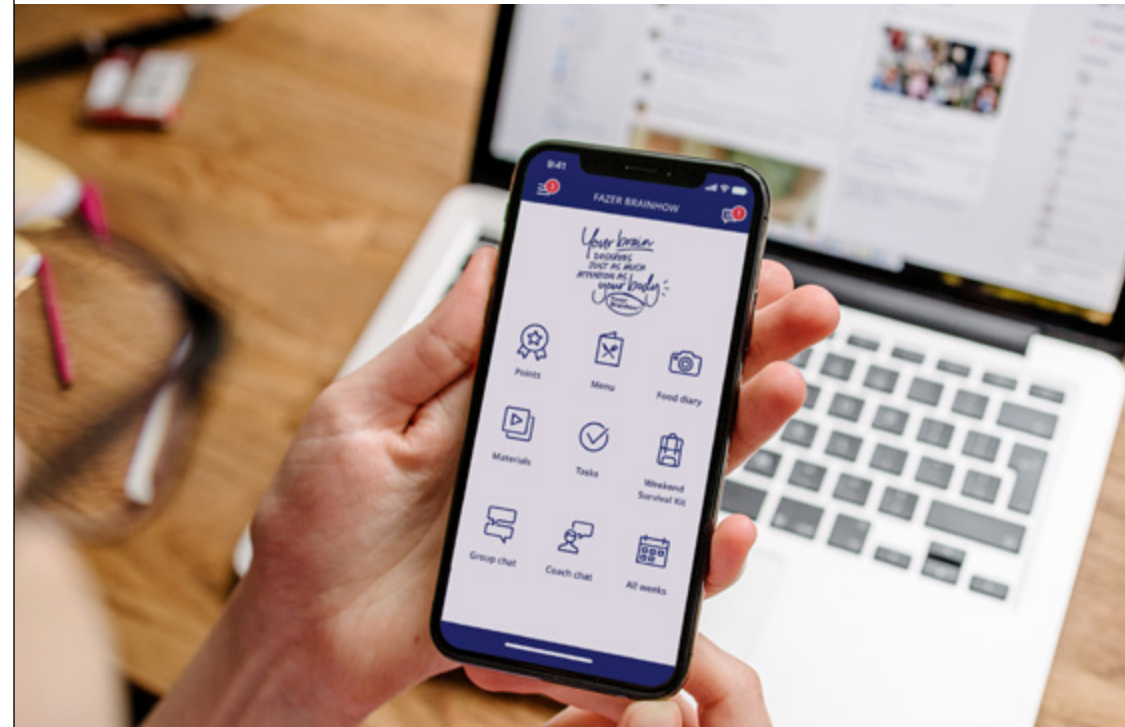
Through embedded questionnaires, the app reports on each passenger's status. Then it assesses the risk level and provides personalized instructions for cruise preparation.

Content and instructions are highly personalized, taking into account their situation, risks, cruise timing, the specific ship and other factors. A wearable device, such as a ring or bracelet, to be worn before the cruise can be a part of the concept. This provides early warning data about the passenger's activity, stress, heart rate variability and body temperature.

Content and the user interface can easily be modified by the cruise ship and be modified for different passenger groups, such as the elderly.

EDUCATING CREWMEMBERS

Cruise lines may also consider making continuous use of the app as a precondition for employment. The app educates employees about any health issues and how to manage individual health risks and proper behavior in different situations.



Employee status can be monitored through regular surveys. Content can be highly personalized for each employee.

The app can be evolved into an overall employee app, including work safety services and promoting a healthy lifestyle.

A COMPLETE PLATFORM

The Wellmo platform provides ready end-to-end technology. It enables rapid iterative development based on a day-by-day situation, user feedback and analytics.

Existing third-party content and services can easily be integrated, including existing cruise line apps,

symptom checkers and official COVID-19 information provided by public authorities.

REFERENCES

Insurance companies

- LähiTapiola / LocalTapiola
- Länsförsäkringar
- AXA

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MATERIAL MAINTENANCE MADE EASY



MATERIALCABINET offers an innovative material maintenance solution MaMa for both shipyards and cruise ship owners. It is a structured storage of information related to cruise ship interior materials. User-friendly interfaces can be tailored to make information easily accessible for different users. MaMa enables first-class service, safety and a sustainable life cycle for products.

MAINTENANCE MAMA

MaMa is a cloud-based service that gathers all information about the materials used in ship interiors and offers maintenance information in a structured way throughout the supply and implementation chain. It promotes the circular economy and sustainability. For end customers, this becomes visible when all the

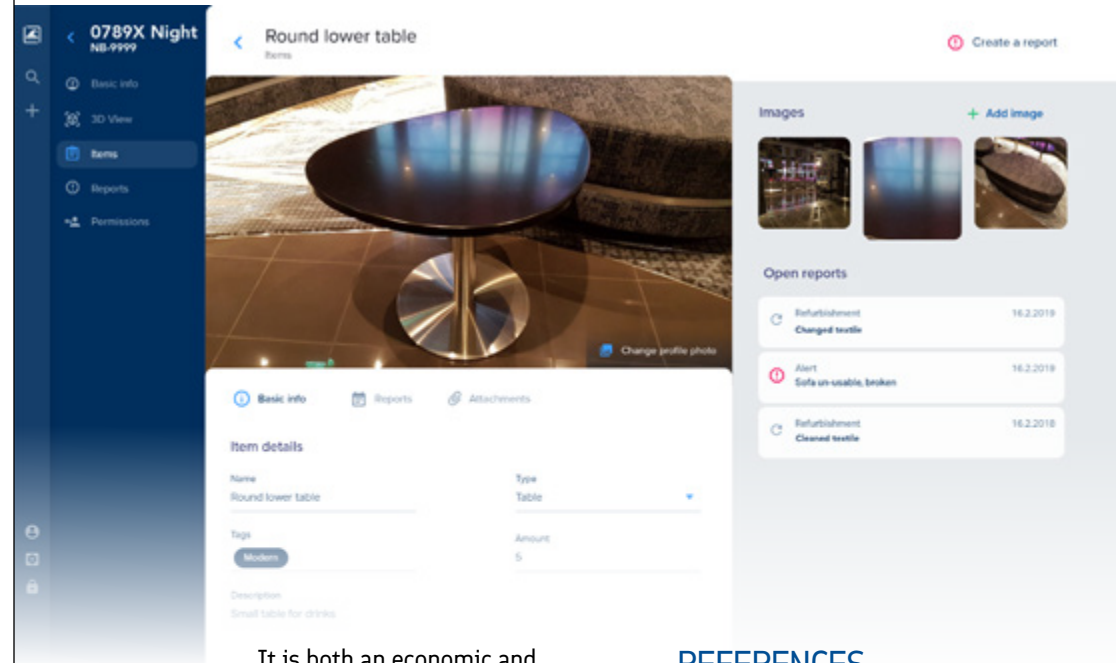
interiors are well maintained, looking as if they were new.

MaMa allows smooth collaboration between all stakeholders in shipbuilding and maintenance.

It creates more effective aftermarket logistics. The right products are in the right place at the right time, allowing for a smaller carbon footprint. All materials are easy to keep clean and replace when relevant information from suppliers can be accessed easily.

MINIMIZE WASTE AND REDUCE WORK

MaMa minimizes waste and allows seamless and effective collaboration between the whole community involved in the building and use of cruise ships.



It is both an economic and ecological solution. It reduces manual work and creates repeatability in renovation, spare parts maintenance, and the recycling and utilization of surplus materials.

MaMa also enables scheduling efficiency, as all data can be reused in future planning and decision making.

It extends the life cycle of cruise ship interiors and promotes sustainable development in the cruise business. The system is always customized for each case and client.

REFERENCES

We won the Ultrahack Hackathon prize in Turku with this application model in 2018.

Our team has decades of experience in interiors for cruise lines, ferry lines, vessels and icebreakers, including numerous newbuilding and refurbishment projects for:

- Carnival Corporation & plc
- Royal Caribbean Cruises
- Finnlines
- Tallink Grupp
- Viking Line

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PASSENGER AND CREW FLOW

HEALTH AND WELL-BEING ON BOARD



Dedicated to People Flow™

KONE has recently introduced innovative features, solutions and services for elevators and escalators, aimed at protecting the health and well-being of passengers and crew onboard vessels.

We want to bring peace of mind for anyone who uses our equipment by reducing the need to touch surfaces, helping to prevent the spread of disease and contributing to a healthier environment by sharing the information and optimizing people and material flow.

KONE'S HEALTH AND WELL-BEING SOLUTIONS

We are continuously developing new solutions to meet our customer needs. Health and well-being concerns are paramount for everyone in the current climate, especially in cruise ships.

In an era when cleanliness, hygiene and physical distancing are vitally important, a key benefit of our solutions for KONE customers is the ability to bring improvements easily.

Our health and well-being solutions and services as well as our people flow expertise:

Reduce the need to touch surfaces

- Foot-operated landing call by kick switch
- Personal elevator call allocation remotely
- Gesture-operated landing call devices

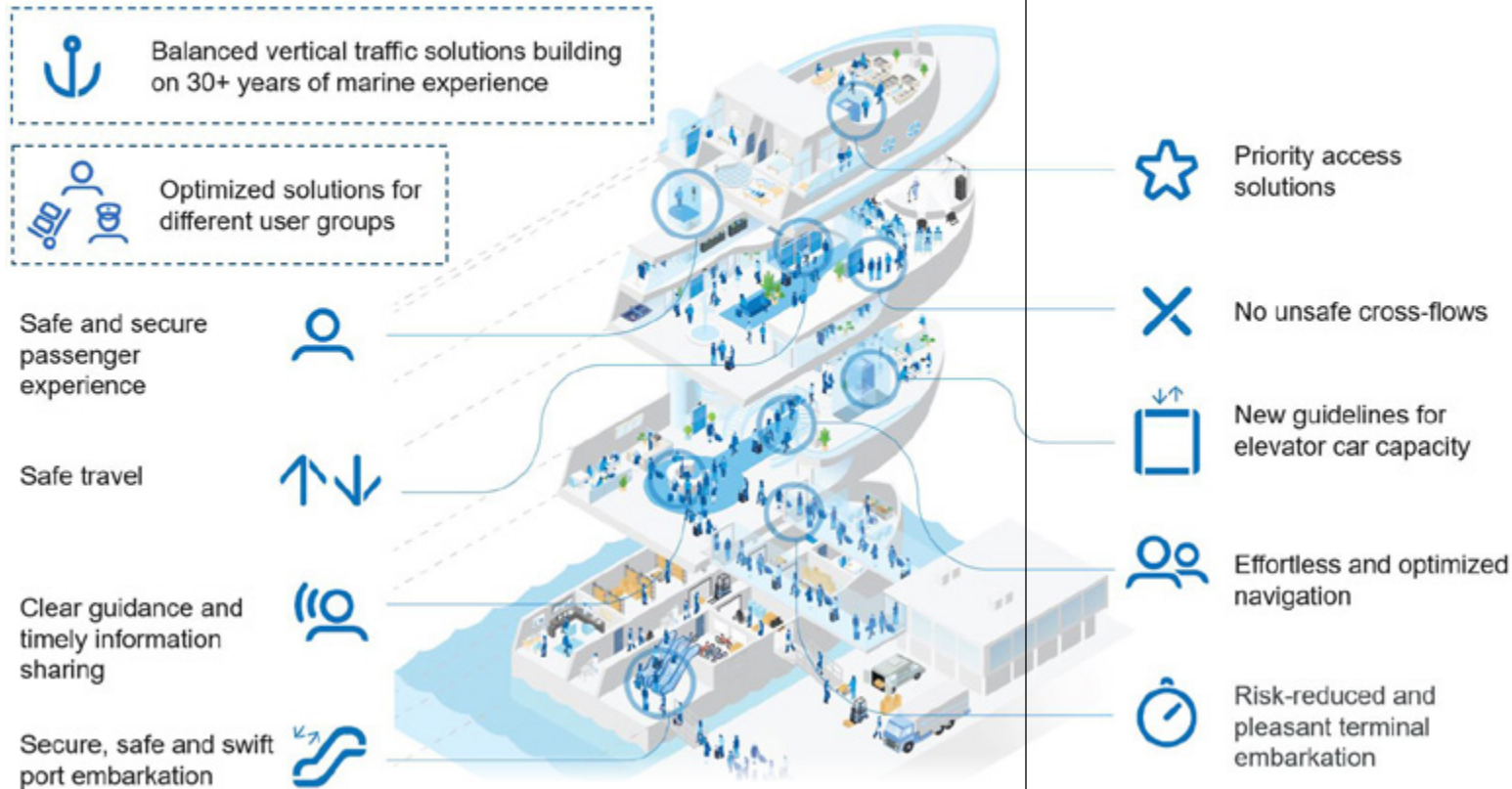
Help prevent the spread of disease

- Elevator car air purifier for clean air
- Antimicrobial handrail coating
- Antimicrobial wall laminate materials
- Elevator full load limit adjustment for reduced passenger count
- Elevator disinfection with coating and lighting technology
- Social distancing elevator floor stickers
- Touchscreen COP for easier cleaning
- Elevator cleaning guidelines
- Handrail UVC light cleaning solution (visible or invisible)
- Physical and detergent-based cleaning solutions

Contribute to a healthier environment by sharing the information and optimizing people and material flow

- People Flow Insights service
- InfoScreen in cars, guidance panels remind of physical distancing and elevator usage
- Elevator etiquette poster
- Handrail UVC light cleaning signage for visible solution

Importance of safe and secure people flow on a cruise ship



REFERENCES

- Chantiers de l'Atlantique – Celebrity Edge, 1st of 4 vessels in the class
- Chantiers de l'Atlantique – Symphony of the Seas, 4th of 7 Oasis-Class vessels
- Chantiers de l'Atlantique – MSC Grandiosa, 3rd of 5 Vista-Class vessels
- Fincantieri – Sky Princess – 3rd of 5 Royal-Class vessels
- De Hoop – Celebrity Flora – 1st of 2 Celebrity Xpedition mega yachts

CONTACT

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INTERIOR SOLUTIONS WITH HIGH HYGIENE STANDARDS | TURNKEY SUPPLIERS

SANITIZING AIR, WATER AND SURFACES



ALMACO delivers comprehensive sanitation solutions to ensure that vessels and people on board adhere to the highest possible hygiene standards.

We offer a unique combination of solutions that sanitize air, water and surfaces. These solutions mitigate bacteria and virus contamination risks. Once sanitized, the solutions help ensure that the interior areas remain protected.

Our solutions use both the latest innovations in the sanitation industry as well as proven solutions from handwashing to advanced self-disinfecting solutions.

COMPLETE SANITIZATION OFFERING

ALMACO works in close collaboration with technology partners to be able to deliver a full turnkey sanitation solution. Our offering covers:

- Touchless faucets – reduces germs transmitted by hand contact
- Advanced hand sanitizer dispensers – for regular use in strategic places
- PremiumPurity™ – advanced self-disinfecting solution that delivers effective long-term protection to actively reduce bacteria and viruses

Full area sanitation can be provided by combining solutions that sanitize air, water, surfaces and drains.



NUMBER ONE PROVIDER

ALMACO has built up a dedicated network of competence and resources to deliver complete turnkey solutions locally all over the world in docks or at sea.

Our large pool of internal resources and subcontractors can be scaled up quickly. We are the number one provider of turnkey solutions with the widest product portfolio in the world.

Our extensive after-sales team, global reach and more than 20 years of experience make us a reliable partner for all onboard vessel sanitizing solutions.

REFERENCES

- Over 350 projects with all major cruise lines and shipyards in the world
- Royal Caribbean Cruise Line Preferred Trade Partner 2019
- Carnival Corporation Strategic Partner
- Genting Strategic Partner

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ANTIMICROBIAL SANITATION FOR CRUISE CABINS

MAKINEN

MAKINEN provides a complete set of products and services for the sanitation of cabin interiors. Our AMS antimicrobial system offers a unique opportunity to improve safety on board cruise ships. It is a practical solution that enables easy transformation of the cabins to the era of new normal, increasing passengers' confidence in travel safety. It is a system of trust, which provides safer cruises and growth to our customers.

SELF-CLEANING DIS- INFECTION SOLUTIONS

AMS includes advanced antimicrobial coating solutions for different surfaces in the cabins. These coatings eliminate bacteria when exposed to UV light. The antimicrobial coatings are available for:

- Walls, ceiling surfaces and wet unit floors
- Fixed and loose furniture
- Doors, locks and handles
- TV, remote controls and light switches
- Shower enclosures and equipment
- Toilet seats and push buttons

A ventilation system is crucial for maintaining healthy cabin interiors. A UV light installed inside the ventilation piping destroys microbes. HVAC self-cleaning and air disinfection solutions guarantee fresh and clean air in the cabins.

SMART MATERIALS

We offer antimicrobial soft materials for cabin carpets, furniture covers, sheets and drapery. The silver ions in these materials prevent bacteria and viruses from replicating and thereby eliminate them. This antimicrobial protection is permanent and helps keep materials clean and hygienic.

SUPERIOR REFURBISHMENT

We are known as the leading interior turnkey project contractor specializing in cabin refurbishments. Our lean project execution guarantees a steady flow of ready cabins. We can deliver up to 200 refurbished high-quality cabins per day.

REFERENCES

- Over 40,000 cabins refurbished during the past five years with major cruise line companies
- RCI preferred trade partner 2019

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MAKING GREAT SPACES HEALTHY



NIT has delivered great spaces to shipyards and shipowners for over 20 years, from design to installation. We specialize in interior design for cruise ships and ferries, creating hundreds of thousands of square meters of the greatest spaces for unforgettable guest experiences.

Creating the best guest experience means innovating solutions for changing circumstances. NIT has taken a step toward cleaner and healthier spaces by offering a complete package for disinfecting various areas with blue light technology.

BLUE LIGHT TECHNOLOGY

NIT represents the latest disinfection technology, increasing cleanliness and improving the guest experience and crew safety. With our trusted partners and subcontractors, we install this innovative technology to eliminate unpleasant odors and microbes from surfaces.

The blue light starts disinfecting when the space is not in use. It is able to destroy 90% of microbes in the first two hours. After six hours, 99.9% of microbes are eliminated.

Combined with a catalytic coating, the results are even more efficient, destroying not only bacteria, mold and yeast but also viruses, endospores and odors. This photon disinfection system is suitable for any area on ships.

NIT provides blue light technology innovated by LED Tailor Oy as a turnkey service. We are able to install Hella Marine manufactured blue light products in newbuilding vessels, vessels undergoing retrofit and ships operating at sea.

MOST RESPECTED SUPPLIER

With 20 years of experience, NIT delivers the highest quality for customers worldwide. We have built a great number of spaces for the finest ships, with more to come. Our vision is to be the most respected partner in shipbuilding.



REFERENCES

NIT has built over 150,000 m² of safe and healthy spaces for most cruise ship owners in the world over 20 years. All our projects are built for public health and safety regulations of which the NIT professionals have a deep understanding.

We are a respected partner for:

- Carnival Corporation
- Costa Crociere
- Royal Caribbean Cruise Line
- Genting
- TUI Cruises

CONTACT

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SAFE AND AESTHETIC HAND WASHING STATIONS

FCR

FCR FINLAND has provided and installed over 1,000 hand washing faucets for sanitary spaces following USPH standards. Our offer ranges from simplified stations to the finest visual state-of-the-art public toilets or public space hand washing stations.

In these current circumstances, we aim to bring solutions equipped with crucial features, such as:

- Touchless faucets to avoid human contact with bacteria and viruses
- Touchless soap dispensers to keep the soap or sanitation liquid / foam from contamination
- Hand drying solutions which do not spread bacteria and viruses
- Automated doors for separate spaces to minimize touching

ANTIBACTERIAL AND ANTIVIRAL LIGHTING SOLUTIONS

We have partnered with the Finnish blue light technology innovators LED Tailor Oy and Hella Marine for their joint venture by carrying out sales and installation. LED Tailor's scientifically proven blue light emitting LED technology solution and lighting features are manufactured by Hella. We have delivered and installed these solutions to fit shipbuilding requirements, such as B15. We do not just sell the lamps, we deliver the entire system.

The system is safe, proven and available now. It can also be selected for installations already in service. Choose this for hand sanita-

tion and toilet spaces or for areas where food is served. Customers can see the most advanced antibacterial and antiviral solutions in action.

PROFESSIONAL TURNKEY SERVICES

FCR was established 10 years ago to offer services for shipowners, mainly for cruise and passenger vessels and commercial vessels. We have over 70 successfully executed projects and a global network of professionals, together with our core team of project managers, supervisors, logistics and project support staff. We have the ability to move on short notice and work even when ships are in service. Our competencies cover everything from electrical to plumbing with state-of-the-art high-quality materials.

REFERENCES

Our relevant references are working closely with Royal Caribbean International, Norwegian Cruise Line, Carnival Cruise Line and their brand vessels.

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INTERIOR SOLUTIONS WITH HIGH HYGIENE STANDARDS | LIGHTING, COMPONENTS

WORLD LEADER IN MARINE LIGHTING

Hella marine 
Vision and Innovation

HELLAMARINE has been creating light for 120 years. We are experts at pleasing the eye while protecting the budget. Hellamarine is part of the respected HELLA KG multinational. Our core competence is the development, production and distribution of advanced transport lighting products using the latest LED technology.

ONE LUMINAIRE WITH TWO FUNCTIONS

Hellamarine brings a new, safer, more efficient and cost-effective method for the disinfection of spaces and surfaces to marine customers.

Our WiSDOM Air disinfection light uses a catalytic coating to destroy bacteria, mold, yeast, fungi, viruses, endospores, odors and harmful VOCs with high efficiency.

A photon disinfection system deploys blue light at night or whenever the targeted space is not in use. The lights are typically controlled either manually with a switch or automatically with a timer or a presence detector. In the daytime, the system works as normal general lighting.



PARTNERING WITH LED TAILOR OY

Our marine products are based on a technology solution provided by LED Tailor Oy, a pioneering company that develops disinfection systems using LED technology. This method is safe for people and materials.

BENEFITS FOR THE CUSTOMER

- Prevents outbreaks by destroying microbes
- Improves the customer experience by eliminating unpleasant odors
- Fully automatic with no operational labor needed

REFERENCES

- Turku University Hospital
- Viola Nursing Home
- Ehyt veterinary clinic
- Salofa Oy
- Finnsementti Oy
- Halikko Pharmacy

Other lighting references

- TUI Cruises, MS1-6
- Royal Caribbean Cruises, Quantum 1-4
- Royal Caribbean Cruises, OASIS 3-4

CONTACT

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SMART AND SUSTAINABLE FAUCETS



ORAS stands for durable, high-quality faucets and showers. The quality of our products is based on Nordic excellence, which means they are long-lasting and timeless in function and form. Our broad product portfolio covers all categories, from home to public spaces, including the health and care environment with its strict demands on hygiene and ergonomics.

Wherever you need to use water in a smart and sustainable way, we have the solution – from public bathrooms to professional galleys and passenger cabins.

The Oras product portfolio covers solutions that meet the green building standards for efficient and sustainable use of water.

MARKET LEADER IN ELECTRONIC FAUCETS

Oras introduced the first electronic faucets to the market as early as the 1990s. Touchless faucets are easy to keep clean, and they help increase the hygiene level remarkably. The spread of bacteria can be prevented, as no part of the faucet needs to be touched.

Our patented position-sensitive detector technology in the sensor ensures that the fitting reacts precisely to the movement of a hand or body.

HISTORY OF ORAS

Oras was established in Rauma, Finland, in 1945. Since its founding, the company has focused on

high-quality design products featuring user-friendly technical solutions that contribute to water and energy savings.

Today, Oras Group is the market leader in the Nordics and a leading company in continental Europe. Oras Group employs approximately 1,400 people in twenty countries and is owned by Oras Invest, a family company and an industrial owner.

REFERENCES

We have long experience and many references in the marine industry.

- Royal Caribbean International
- Explorer of the Seas 2020 refurbishment
- Oasis of the Seas 2019 refurbishment – new build in 2009 with Oras
- Voyager of the Seas 2019 refurbishment – new build in 1999 with Oras
- Celebrity Cruises
- Celebrity Constellation 2020 refurbishment
- Viking Line Ltd
- M/S Viking Grace 2013 newbuild

CONTACT

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HYGIENIC NON-TOUCH DOORS



POCADEL is the leading supplier of fire-resistant glazed doors for cruise vessels. As a forerunner, Pocadel has introduced innovative and reliable glass door solutions that increase the convenience and safety of passengers and shipowners alike.

In today's world, hygiene has become one of the most important criteria for door solutions. On cruise vessels, manually opened doors are one of the biggest sources of bacteria – despite regular cleaning.

HYGIENIC, NON-TOUCH FIRE-RATED GLASS DOORS

The best way to prevent microbes and other impurities from occurring on door surfaces is to open the doors automatically. Pocadel offers solutions for its fire-rated glass doors to significantly improve the hygiene level and sanitation on vessels.

Solutions for automated doors:

- Automatic doors equipped with radar detect a person and open the door automatically. Automatic drive units are available for both sliding and hinged doors
- Contact-free switches (Clean Switch, Clear Way). The door is opened automatically, contact-free, by waving a hand in front of the switch. A great solution for spaces such as sanitary facilities, stores and restaurants
- Fire-rated glass doors with an electronic lock, for instance, in cabin corridors. The door can be opened with a card or mobile phone

Solutions for manual doors:

- Special handles enabling users to open the door with their arm
- Antibacterial door handles and door pulls with a dirt-repelling finish
- New bacteria-free glazings



FORERUNNER IN FIRE-RESISTANT GLAZINGS

Pocadel Oy is the leading supplier of B15 and A60 fire-resistant glazed doors and partitions. Our continuous product development work and decades of experience have made us a well-known and respected expert in our field.

We also offer a service network guaranteeing the functionality and regular maintenance of our doors all over the world.

REFERENCES

We have delivered our doors to nearly all cruise ships and passenger ships built or refurbished during the past 20 years.

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DECORATIVE INTERIORS AT SEA

DEKOTEL



DEKOTEL COATING specializes in high-quality, wear-resistant decorative interior materials for the maritime industry. We provide a wide range of decorative, easy-to-clean and IMO-approved interior materials for cruise ships and other public interior projects.

Our goal is to transfer any type of visual image to any material without any limitation regarding the image, the material or technical property.

MATERIAL SOLUTIONS FOR DIFFERENT SPACES

Our DEKO product range provides interior materials for indoor, outdoor and food preparation areas, and for wet-unit floorings and walls.

In addition to an exceptional visual appearance, we carefully take into consideration different technical qualities, such as easy cleanability, chemical resistance and wear resistance. Our goal is to reduce the total material weight, amount of combustible materials and to shorten installation time. Typical materials used are aluminum, stainless steel, vinyl, glass, wallpaper and tiles.

WET UNITS AND FOOD PREPARATION AREAS

The DEKO Floor Panel is a new, innovative module product that provides excellent chemical resistance, wear resistance, fire resistance and ease of keeping clean. Due to its anti-slip and waterproof properties,

the DEKO Floor Panel is an excellent product for wet units. The base material aluminum is lightweight. It can be also used as a wall covering.

DEKO Stainless Steel has been developed especially for food preparation areas on cruise ships, where ease of cleaning, even surfaces and wear resistance, are the most critical technical properties. Different decoration techniques make any kind of visual appearance possible, such as tile imitations.

REFERENCES

- Royal Caribbean Cruise Line
- Carnival Cruise Line
- TUI Cruises
- MSC Cruises
- Disney Cruise Line
- P&O Cruises
- Norwegian Cruise Line
- Celebrity Cruises
- Brittany Ferries
- Viking Line
- Tallink Silja
- Eckerö Line
- Finnlines
- AIDA Cruises

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INTERIOR SOLUTIONS WITH HIGH HYGIENE STANDARDS | CATERING

PREVENTING MICROBES IN CATERING

Kavika

KAVIKA Designed to prevent microbe contamination, Kavika's stainless fixtures and equipment are an excellent choice for marine catering.

Based on long experience in this field, all our solutions are compliant with the Vessel Sanitation Program of the United States Public Health Service (USPHS).

EASY TO KEEP CLEAN AND HYGIENIC

We have placed special emphasis on the fixture structures to facilitate easy cleaning and eliminate the accumulation of microbes.

Examples of our emphasis on details are sneeze guards on distribution counters to prevent

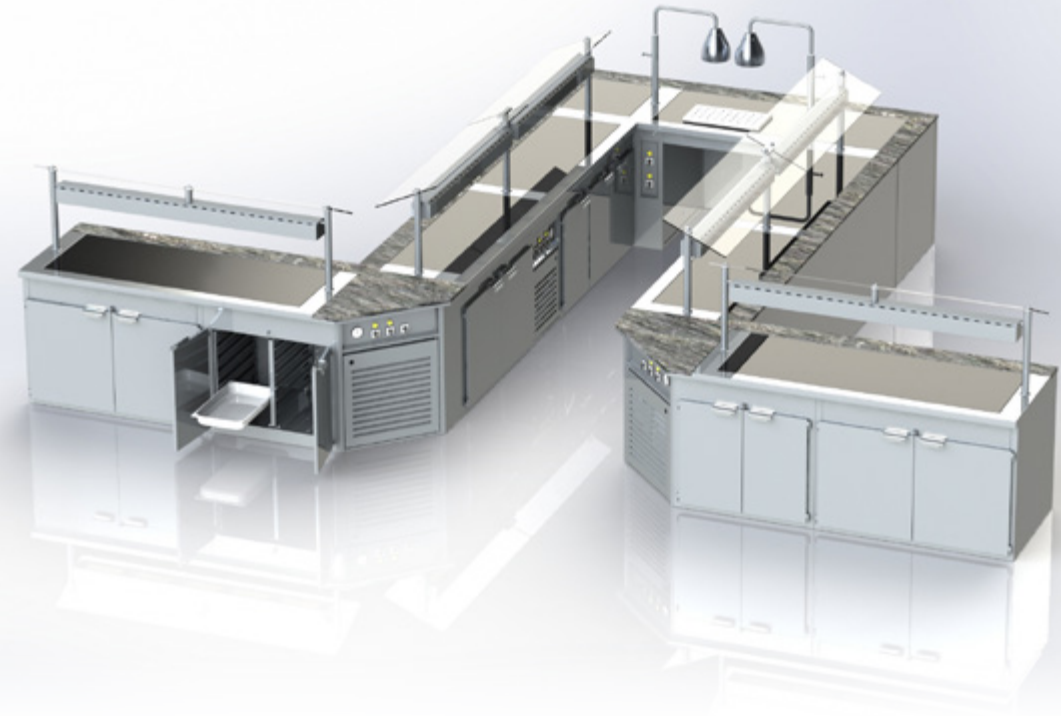
aerosol contamination from entering the served food and compact hand washing stations.

Our professional assembly plays a key role in the overall visual turnkey solution.

SPECIAL EQUIPMENT FOR THE JOB

Kavika's high-quality hygienic solutions are also used in laboratories and hospitals, for example, in operating and clean rooms.

All the tailor-made fixtures can be easily modified for special surroundings and environments. We have also delivered special equipment to ships, such as research vessels.



REFERENCES

- Fittings and fixtures with a high hygiene level standard for more than 200 luxury liners and special-purpose vessels
- Demanding solutions for hospitals, pharmaceutical and biotechnology companies, together with universities and research centers

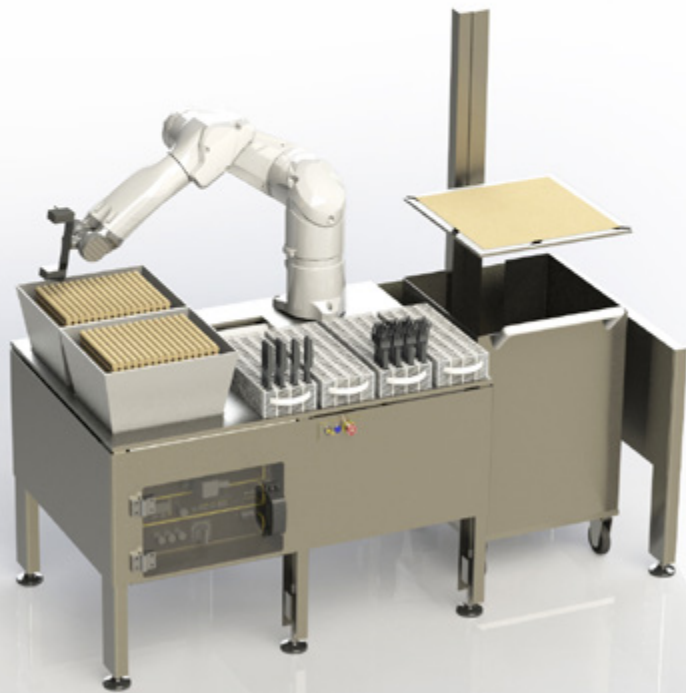
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AUTOMATED CUTLERY WRAPPING FOR BETTER HYGIENE

K I N E



KINE ROBOT SOLUTIONS The Cutlery Wrapper Robot from KINE Robot Solutions automates the wrapping of forks, knives or spoons into napkins as ready-to-serve cutlery wraps.

After the COVID-19 crisis, increasing hygiene in public restaurants will be highly appreciated. On a large cruise vessel, up to 20,000 cutlery wraps are used every 24 hours. This means that up to 20 persons can spend several hours a day wrapping the cutlery, often in very small spaces.

IDEAL WAY TO IMPROVE CUTLERY HYGIENE

By wrapping cutlery into a napkin without human contact, it is possible to improve restaurant hygiene significantly.

Restaurants in cruise ships and at terminals can get major benefits by using our automatic Cutlery Wrapper Robot.

- Cutlery hygiene is guaranteed for restaurant customers and crewmembers
- A robot wraps the cutlery without any human workforce required
- Crewmembers no longer need to waste their time wrapping cutlery

CUTLERY WRAPPER AUTOMATION BENEFITS

The Cutlery Wrapper Robot avoids human contact and eliminates the need for crewmembers to spend their time in cramped spaces wrapping cutlery on provisional tables.

The robot can access the same cutlery racks used in the dishwasher, so no human contact is made after the cutlery has been washed. A trolley holding the napkins can be pushed into the cell. The wrapped cutlery is placed into a container for storage until it is time for use.

REFERENCES

KINE Robot Solutions has 20 years of experience in robot system integration and development. One of the main branches is the food industry. We are very familiar with hygiene and clean room environments and with maritime conditions and cruise liner operation practices.

We have a track record of 300+ projects and robot system deliveries worldwide. Our portfolio includes the biggest robot branches in the world of robot manufacturing.

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ECOLOGICAL AND HYGIENIC SPREAD DISPENSER



FOODDUCK The FOODDUCK® spread dispenser is a Finnish innovation for serving spreads hygienically at bread buffets and food service lines.

FOODDUCK brings many benefits to diners, restaurants and the environment. With the help of this ecological and modern spread dispenser, plastic and spread waste can be reduced considerably. Customer experience improves as the bread table stays clean, safe and welcoming.

IMPROVING HYGIENE IS OUR EMPHASIS

The coronavirus pandemic has forced people to pay more attention to hygiene.

FOODDUCK can considerably improve hygiene at restaurants and self-service areas on ships, ferries and at ports. With our innovation,

you can say goodbye to messy knives and spread cases at buffets and restaurants – and eat bread safely.

SMART AND COST-EFFECTIVE RENTAL

The FOODDUCK business model is based on a cost-effective monthly rental concept, with devices covered by a maintenance contract.

We use high-quality components to ensure a long product lifecycle. Plus, the device incorporates the latest IoT technology, providing real-time data on spread consumption and usage. The system also helps optimize maintenance services.

BENEFITS OF FOODDUCK SPREAD DISPENSER

FOODDUCK is unique. It offers a hygienic and environmentally



friendly solution that supports the latest megatrends, such as sustainability and the circular economy.

- Modern
- Hygienic
- Environmentally friendly
- Less plastic and spread waste
- Suitable for people with celiac disease
- Safe and fully automatic

REFERENCES

- Professional kitchens and restaurants in Finland and Sweden
- Public sector: hundreds of schools and day care centers
- Medical sector: health care centers and residential services for the elderly

Foodduck Oy is listed as one of the most interesting companies of the circular economy in Finland by Sitra, the Finnish Innovation Fund.

CONTACT

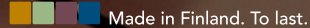
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INTERIOR SOLUTIONS WITH HIGH HYGIENE STANDARDS | FURNITURE

SOFA BEDS WITH RECYCLED MATERIALS

PEDRO



Made in Finland. To last.



PEDRO furniture combines Scandinavian design, functionality, high quality and sustainable and ecological manufacturing. We continuously carry out active research and development in cooperation with furniture designers and our customers.

Sofa beds are at the heart of PEDRO Ltd's product range. Thanks to years of vigorous product development, PEDRO is able to offer a wide range of easy-to-use, high-quality sofa beds that use recycled materials. PEDRO sofa beds are suited for private homes, for commercial and hospitality use and on ships.

ENTIRE CHAIN IN OUR HANDS

One of PEDRO's strengths is having the entire production chain under the same roof, from designing to assembly. We have comprehensive and wide-ranging knowledge in designing furniture to match specific environments.

Established in 1988, Pedro Ltd is located in Lahti, Southern Finland. We are a leading manufacturer of commercial and hospitality furniture, with a wide range of chairs and sofas for commercial spaces, including ships.

SUPPORTING ENVIRONMENTAL VALUES

As our customers have become more aware of the growing concern over environmental issues, we both support and stress these values in our production and operations.

PEDRO has used over 1 million recycled PET bottles in our sofa bed cushions. Our hometown of Lahti has been chosen as the European Green Capital 2021. We're extremely proud of that!

REFERENCES

- National Geographic Endurance
- TUI Cruises Mein Schiff 1, 2, 3, 4, 5 and 6
- Carnival Cruise Line
- Dream Cruises
- Costa Cruises

CONTACT

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THE FIRST ANTIMICROBIAL FURNITURE COLLECTION IN THE WORLD

ISKU

ISKU ISKU+ collection is the world's first antimicrobial furniture solution contributing to a cleaner environment.

Antimicrobial materials cut down the reproduction and spread of microbes. The innovation in our antimicrobial furniture is based on copper, silver and other technologies on surfaces, fabrics and coatings. The antimicrobial feature can be used in all public interiors, including ships and ports.

We prefer environmentally sustainable materials and manufacturing methods. This comes to life, for example, through our certified quality (ISO 9001) and environmental systems (ISO 14001) and by employing the certified tracking

system for wood origin (PEFC CoC) to support sustainable forestry.

CONTINUOUS RESEARCH FOR COMPLETE SOLUTIONS

ISKU+ solutions have been researched in cooperation with universities and other companies within antimicrobial applications. The most notable research program, IHMEC, focuses on antimicrobial surface applications to mitigate antibiotic resistance within the construction industry.

ISKU is also part of HygTech Alliance, a research and business alliance of Finnish companies with technologies for the complete antimicrobial interior.

REFERENCES

ISKU has cooperated closely with ship construction and development companies for the past 20 years.

- Meyer Turku – Royal Caribbean, TUI Cruises, Carnival Cruises
- Chantiers de l'Atlantique – Celebrity APEX, Celebrity Edge, Symphony of the Seas, Harmony of the Seas

Antimicrobial ISKU+ solutions have been delivered to onshore health-care and educational facilities.

- Helsinki University Hospital, Finland
- Vilnius University Children's Hospital, Lithuania
- Acibadem Maslak Hospital, Turkey

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SANITATION, HEALTHCARE AND WELL-BEING SOLUTIONS

DISINFECTION SYSTEMS ON BOARD
AND ONSHORE

eLZO

KEMPPI

LAMOR

EL & SITE

SOL

nanoksi



PASSENGER AND CREW CARE SOLUTIONS

MEDIXINE

LOJER

Air0
CREATED IN FINLAND

SAFE PATIENT TRANSPORT SOLUTION

IO2
FEENIKS

Decont

DISINFECTIONS SYSTEMS ONBOARD AND ONSHORE

ELOZO OZONE CLEANING SYSTEMS

**HTT-GROUP / ELOZO**

Elozo® products, manufactured by HTT-Group Oy, offer solutions to refresh and disinfect all personal protective equipment, clothing, gear and premises without using any chemicals and water.

These products are a perfect solution when visible stains do not need to be removed, but you need to have items fresh and disinfected.

Elozo cabinets are robust and easy to use. You only need electricity and an exhaust connection. All Elozo products are made from stainless steel to ensure a long lifetime.

**DIFFERENT PRODUCTS
FOR VARYING NEEDS**

We offer a wide range of cabinet sizes from 200 liters to a 2,000-liter treatment chamber for refreshing and disinfecting clothing, accessories and gear.

We also provide a portable ozonator to refresh and disinfect cabinets or premises.

REFERENCES

- AIDA Cruises
- Oulu University Hospital

CONTACT

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CLEAN AND SAFE BREATHING AIR



KEMPPPI SAFETY Kemppli Safety's Gamma GTH3 RFA is a positive pressure respirator for personal protection against airborne contaminations. The robust and reusable TH3 respiratory protection system is ideal for multi-shift work environments. CE certified to EN 12941, Gamma GTH3 RFA high-performance respirators ensure clean and safe breathing air with 99.8% efficiency.

High-efficiency HEPA 3 PRSL filter cassette filters 99.99% of liquid aerosols and solid particles to a minimum size of 45 nm. Lithium-ion battery technology guarantees fast charging times and the power to protect during extended work periods.

COVER EYES AND FACE WITH COMFORT

Gamma GTH3 RFA offers protection for the eyes and face, featuring a replaceable 170° wide-view impact grade visor. It also provides adequate space for eyeglasses and is easily adjustable. The lightweight structure and fabric face seal ensure user comfort for lengthy wear periods.

Robust and durable, the battery-powered filter unit allows safe freedom of movement. Selectable fan speeds, battery and filter state indicators, as well as visual and vibration alerts,

keep the user informed. Plus, a choice of either standard-duty or heavy-duty fast-charging batteries ensures efficient respiratory protection for long work durations in contaminated areas.

SAFETY FOR EVERY JOB

Kemppli Safety Oy is part of the Kemppli Oy Group, known as the pioneering company within the welding industry. Headquartered in Lahti, Finland, Kemppli employs over 800 welding industry experts in 17 countries and has revenue of more than EUR 150 million. Our global partner network covers over 60 countries.

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LEADER IN EMERGENCY RESPONSE SERVICES

LAMOR

Let's clean the world

LAMOR is an internationally recognized leader in emergency response services, available 24/7, with a presence in 104 countries around the world.

Our service portfolio includes specialized disinfection, decontamination and disposal services. We use the highest standard of practice, offering our certified and trained personnel with high-level service, protective equipment and permanent global support.

QUALIFIED AND COMPETENT PERSONNEL

All Lamor personnel have training and education in occupational health and safety measures to carry out activities safely without putting their health, or that of their collaborators, at risk.

Lamor provides each employee with the necessary personal protective equipment as specified in the site-specific safety plan. Work at each site is controlled by qualified and competent professionals who continuously monitor conditions.

INTERNATIONALLY ACCEPTED DISINFECTION PROCEDURES

Lamor offers a specialized service for cleaning and disinfection tasks. Our procedures are internationally accepted and completely safe for port and ship sanitation.

Separate work safety procedures and an analysis plan are always carried out before disinfection tasks. In addition, a thorough assessment of the site to be disinfected is performed.



LAMOR
Let's clean the world

VERIFICATION OF DISINFECTED AREAS

In environments with virus presence, Lamor deploys verification methodology to ensure the effectiveness of cleaning and disinfection. This helps track and validate quality, as well as provides a quantitative results report.

REFERENCES

- Nessus Hotels Peru – Casa Andina Hotels
- Numay S.A. – Gasoline distribution
- Global Fuel S.A. – Gasoline distribution

Waterdisinfection

- Meyer Turku
- Viking Line
- TUI Cruises

CONTACT

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POWERFUL DISINFECTION OF LARGE AREAS



EL & SITE has converted a dust suppression system into a disinfection cannon to fight the outbreaks of viruses. An innovative NCA (non-contaminated area) system has been created to reduce the diffusion of infective bacteria and viruses.

Our automated disinfection cannon is a powerful tool for use on vessels and at ports. With its help, large areas can be sprayed with disinfection liquid.

The original operating principle of the dust suppression machine sprays a fine mist of water to neutralize dust at construction sites. Now, disinfection liquid replaces water and is sprayed effectively across a wide area.

CUSTOMIZABLE ALL-IN-ONE SOLUTION

Our cannons are available as remotely controlled, all-in-one packages, including a generator, tanks and automatic oscillation. Simpler versions are also available.

The cannon covers an area of up to 40 meters in length, 15 meters in width or 340° around the cannon. The coverage area can be adjusted. The telescopic mast is adjustable up to 4.7 meters with automated rotation. The cannon can be easily moved with a road tow trailer and forklift pockets.

TEMPORARY LIGHTING AND POWER

Apart from disinfection products, EL & Site offers temporary lighting and power equipment to new building and refurbishment projects.

Our own development, EL & Site's robust LED lighting system is very well suited for the temporary lighting of shipyards and vessels. In addition, we offer innovative LED light towers, which are effective in lighting up large areas.

Our temporary power switchboards are small in size, light, safe and modular.

REFERENCES

NCA systems:

- Barcelona Public Authority, Spain
- Timcal Ltd, Switzerland
- Corgin Ltd, UK
- Power Ram Sdn Bhd, Malaysia
- Linea Green SpA, Italy
- Diagnostics & Maintenance Technique, Philippines

Lighting and power solutions in shipyards:

- MV Werften Global 1 and 2, Germany
- Helsinki Shipyard, Finland
- Meyer Turku, Finland

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DISINFECTION FOR END CLEANING AND EPIDEMICS



SOL PALVELUT is making cruising healthy and safe again. Our disinfection methods guarantee a safe and hygienic environment for crewmembers and passengers.

Our NocoSpray hydrogen peroxide dry steamer provides widely researched and safe disinfection for end cleaning and epidemics. All surfaces, including soft materials, are well disinfected after the cleaning procedures are finished.

The method includes both the device and the disinfectant.

PREVENTING INFECTIOUS DISEASES

NocoSpray is highly effective in preventing norovirus, clostridium, influenza, MRSA, VRE, molds, lice and other infectious diseases and agents.

Places where NocoSpray can be used:

- Ships and hotels
- Schools, daycare centers and offices
- Patient rooms and elderly nursing homes
- Restaurants
- Cleanrooms, pharmaceutical laboratories and other special hygiene facilities

REFERENCES

- Viking Line
- Tallink Silja

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NOCOSPRAY –
HYDROGEN
PEROXIDE DRY
STEAM FOR AREA
AND AERIAL
DISINFECTION



SELF-DISINFECTING SHIPS



NANOKSI offers a complete photocatalytic nanocoating service for ships. The photocatalytic coating service uses photocatalytic reactions to form an oxygen compound that kills viruses, bacteria and fungi in a matter of hours. And keeps doing so around the clock.

The reaction is a very effective way to kill contagions and contaminations. Up to 98% are killed within two hours. The process is perfectly safe for humans, animals and nature.

WORTH THE INVESTMENT TENFOLD

With the Nanoksi solution, crews and passengers have less chance of transmitting contagions via surfaces. Infections from seasonal influenza, norovirus and viruses

like coronavirus are significantly lower. Nursing homes that applied the photocatalytic coating have been able to avoid the norovirus epidemic ever since the application.

MULTIFOLD BENEFITS

In addition to health benefits, the economic advantages of healthy crewmembers and customers are significant. Only a few crewmembers or customers not getting infected is enough to bring a positive return on investment. Taking into account canceled trips and purchases, crewmember sick leave expenses and other losses, the expected return on investment is ten- to fiftyfold within a year.

Marketing benefits are also apparent. Customers want to know they are safe. It is crucial for



cruise ships and ports to provide assurance that everything is being done to ensure the health of the customers. What is more, the photocatalytic process also kills bad odors effectively, ensuring better customer experience.

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REFERENCES

- Vetrospace (Soundproof office pods)
- Mikkeli Central Hospital
- Verkkokauppa.com
- Viola nursing home – no recurring annual norovirus epidemic for two years in a row after coating

PASSENGER & CREW CARE SOLUTIONS

CONNECTED CARE IN SHIPS AND PORTS

MEDIXINE

MEDIXINE As a forerunner in connected care, Medixine strengthens ship and port safety by providing modern telehealth solutions. Our proven and effective tools are now available to help the marine world.

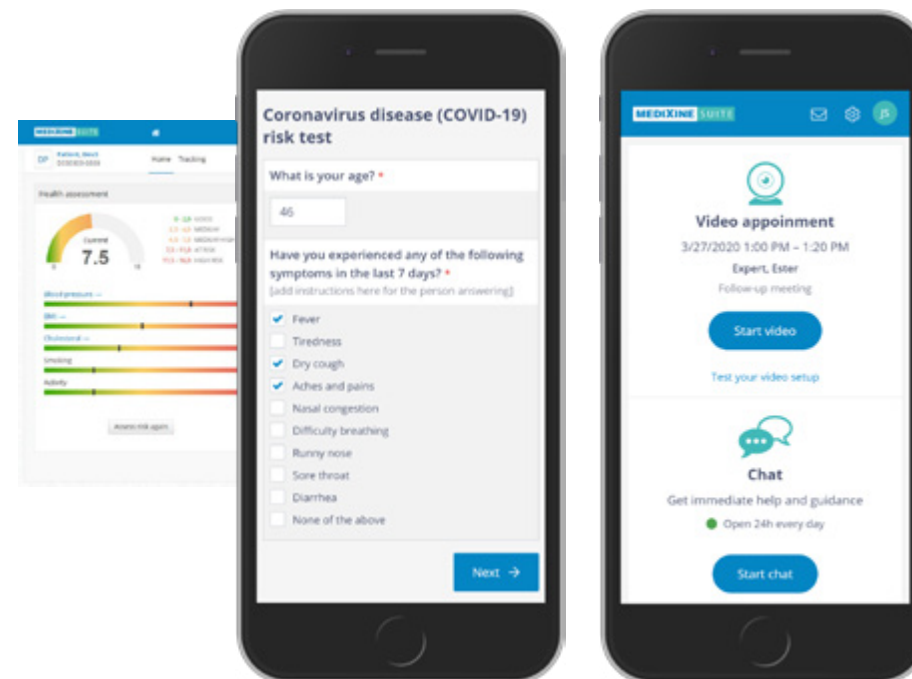
Telehealth has taken its place as a mainstream tool in healthcare. The same tools that are used by medical professionals on land can bring significant benefits for offshore use.

With Medixine Suite, medical services can be offered to persons without physical contact. Even when under quarantine, individuals can be helped by professionals on board the ship or from experts on land, without any risk of transmitting disease.

SHARING HEALTH INFORMATION EASILY

Passengers and crewmembers can be screened, and health information can be shared directly using their mobile phones.

To access the service, the only thing needed is the web address. Medixine Suite can be used on mobile phones, tablets or PCs, without installing any dedicated apps.



REFERENCES

- German-based Linde – full remote monitoring services to Linde internationally
- FSHS Finnish Student Health Service – all connected services for the Finnish national student healthcare system with 130,000 university students
- NHS (www.nhs.uk) – Parkinson's Disease Network and a national chronic obstructive pulmonary disease service using remote monitoring
- Region of Southern Denmark – connected care solution for 23 treatment places in 13 hospitals, delivered through partner Systematic

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HEALTHCARE AND MEDICAL WELLNESS

LOJER[®] *For easy care*



LOJER GROUP is a Finnish manufacturer of innovative and highly hygienic hospital equipment, serving healthcare professionals and patients.

Our antimicrobial product range is designed to prevent microbes from spreading. As part of our antimicrobial products, we use solutions such as:

- Antimicrobial upholstery
- Antimicrobial powder coating
- Touch-free adjustments
- Antimicrobial laminate

MARINE HEALTHCARE PRODUCTS

For the marine industry in particular, we can provide antimicrobial products, including:

- Treatment tables (Capre F5)
- Examination tables (4040X)

All products can be delivered with so-called ship-feet for fixed installations.

A HEALTHCARE ALLIANCE

Lojer Group is part of the Finnish HygTech Alliance, which develops a holistic line of products related to hygiene management and antimicrobial solutions.

Lojer Group and HygTech Alliance are also a part of the EU-funded IHMEC project that is providing a response to the threat of antibiotic-resistant microbes.

REFERENCES

- New Children's Hospital, Finland – antimicrobial examination tables
- Johns Hopkins Hospital, USA – treatment tables
- ShipMed, Norway-based marine medical safety supplier – patient stretchers, hospital beds, instrument trolleys for ships

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PROFESSIONAL AIR PURIFICATION SOLUTIONS



AIR0 helps you provide safe indoor air for your employees and customers.

Clean indoor air is a vital safety element and is now more relevant than ever before. Port areas are heavily polluted globally, but air pollution indoors may also contain infectious viruses and bacteria. Health risks can be reduced with efficient air purification. When done right, indoor air purification combines high filtration efficiency with optimal air flow for the room.

WORLD-CLASS AIR PURIFICATION TECHNOLOGY

Air0 has developed a unique smAIRt® technology that enables excellent air purification efficiency combined with extremely high air flow.

Our unique air purification technology has proven efficiency,

even against ultrafine particles, thus also removing viruses from the air. In addition, the technology also removes harmful gases (VOCs), allergens, bacteria and other particles from the air.

CLEAN AIR AS A SERVICE

Our all-inclusive Clean Air as a Service model is the most care-free way to provide clean air. Our Air0 expert team monitors the air quality and operates the air purification system to ensure optimal efficiency, reporting the results regularly.

Our standalone air purifiers are cloud connected, which enables full remote control from anywhere, purification schedules for optimal performance and automation when connected to our wireless indoor air quality sensors.

We also offer custom-made solutions to purify larger indoor areas.



REFERENCES

We have wide experience in delivering Air0 Clean Air Solutions for commercial and public sector customers such as offices, hotels and schools.

Some of our references:

- The National Stadium Bird's Nest, Beijing, China
- Ministry of Foreign Affairs of Finland
- Corporatum Ltd

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SAFE PATIENT TRANSPORT SOLUTION

INNOVATIVE PROTECTION SOLUTIONS



IC2 FEENIKS is one of Finland's leading designers and manufacturers of protective materials and products for the chemical, biological, radiological, nuclear and explosives (CBRNE) market.

We offer deployable infectious patient isolation pods (IPIPs) and portable disease and virus decontamination systems.

INFECTIOUS PATIENT ISOLATION PODS

The IPIP is a deployable single-patient isolation system, protecting passengers and crewmembers. Quick to set up and use, it is highly reliable, made with tested quality materials and offers a long service and shelf life. The system's battery provides eight hours of power.



The IPIP comes with an integrated air pump and filters, and the blower feeds an over-pressure system with ABEK2P3 or CBRN filtered air. The air is filtered as it is expelled, ensuring the safety of those who are working with the patient, whether in transporting or tending.

The unit comes packed in a PVC case and, therefore, can be decontaminated for further use if necessary. The system allows continuous treatment of the patient using a feed-through setup for IV, O₂ and glove insertions.

The pod is resistant against all known viruses, including COVIDs. A number of these kits should be kept permanently on board or in the port area to be deployed at the first signs of a virus outbreak. The patient can be treated or evacuated safely, with little risk to other crewmembers and passengers.

MOBILE DECONTAMINATION EQUIPMENT

IC2 Feeniks also offers the Cleamix VCS-20 and VCS-100CR decontamination units.

These are portable systems that rapidly decontaminate rooms using a fine mist spray of hydrogen peroxide. The system completely kills all viruses and contagious substances on any surface within 20–30 minutes and is then quickly dispersed to allow almost immediate re-use of the cabin.

Our mobile VCS-20 decontamination units can be used for deep and

targeted cleaning of galleys, public areas and crew quarters, whereas VCS-100CR systems can be held at ports for a scheduled cleaning of ships. VCS-100CR can simultaneously manage multiple decontaminations, cleaning up to 50 rooms at a time during passenger changeover.

REFERENCES

- Finnish Air Force – hangars and maintenance shelters, and VCS-100CR units
- Finnish Defence Forces – tents for various applications, collective protective systems, CBRN isolation pods for contaminated patient transportation and VCS-100CR units
- Swedish Defence Forces – VCS-100CR units
- Australian Defence Forces – CBRN isolation pods
- Major university and central hospitals in Finland and Europe – IPIP's for paramedic transportation and isolation use during COVID-19 pandemic and VCS-100CR units
- Major university and central hospitals in Finland, global laboratories and hospitals – VCS 100 vaporized hydrogen peroxide decontamination systems

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POWERFUL AND SAFE DECONTAMINATION

Decont

DECONT We use Finnish high-tech at its best. Our method for decontaminating a ship's compartments and cargo is based on Cleamix VCS-100 unit's hydrogen peroxide vaporizing (HVP) and its detergent effect.

We use Finnish high-tech at its best. Our method for decontaminating a ship's compartments and cargo is based on hydrogen peroxide vaporizing (HPV) and its detergent effect.

CLEAN AND CONTAMINATION-FREE ENVIRONMENTS

These days, the risk of contamination is high. Because of COVID-19, people are paying more attention to disinfection, cleaning and hygiene.

Increasing the level of hygiene is very important. In the future, decontaminated areas and goods may become the "new normal."

Hydrogen peroxide vapor can terminate many known infectors, but also some harmful chemical mixtures as well as fungus and mold.

- COVID-19
- SARS, MERS
- Anthrax
- Poison gases
 - Mustard gas
 - VX nerve agents
 - Soman nerve agents
- Candida auris



OFFERING TOTAL DECONTAMINATION

Hydrogen peroxide gas is a material-friendly method to disinfect all kinds of surfaces, materials and air. It penetrates through soft material, destroying all microbes and even fungus. As a gas form, it safely cleans all electrical equipment and circuit boards.

At DECONT, we have trained staff to provide the best possible solution for you. Our operating area is Northern Finland and Northern Sweden.

REFERENCES

- Bilmax Oy – decontamination of vehicles, mobile homes and offices
- LAPPICA – decontamination of droplet infection rooms
- Kutilan Liikenne Oy – disinfection of buses

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RETHINKING
HEALTH AND
HYGIENE,
PASSENGER
FLOWS, CABINS
AND ONBOARD
EXPERIENCES
– FINNISH
MARITIME
INNOVATIONS
CAN ENSURE A
COMFORTABLE
AND SAFE
JOURNEY.



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