



**STARKICE**

an Aker Arctic company

**INTELLIGENT DE-ICING**



Starkice is specialized in Arctic de-icing systems for vessels, platforms and terminals. Our innovative system and turnkey solutions include full life cycle support, from designing to installation and maintenance.

Starkice is a joint-venture of **Aker Arctic Technology** and **Pistesarjat**, leading experts of their specialized areas, and has altogether 150 years of experience with clients who operate daily in cold climate environments.

Our mission is to provide  
**THE SAFEST AND MOST RELIABLE  
DE-ICING SYSTEMS IN THE WORLD**

Aker Arctic





# Cost savings efficiency and safety



Operating in the most demanding conditions of the world requires extreme accuracy, high-quality vessels, and profound experience. In this environment, it is a matter of managing transportation from one port to the next on schedule. In cold conditions, the support provided by intelligent systems is important. **THE STARKICE SYSTEM** supports your operations in cold conditions 24/7 while optimizing safety, reliability and energy consumption.



Energy save up to  
**30%**



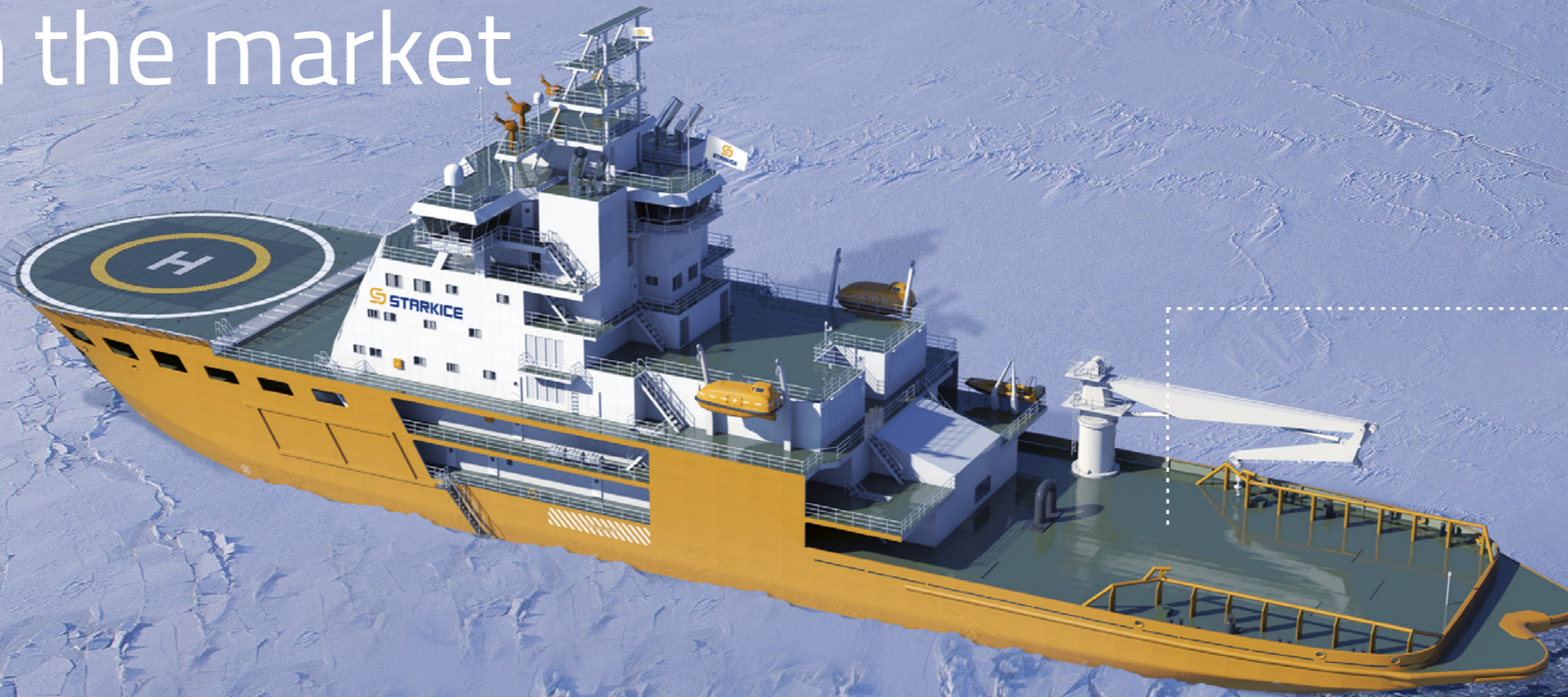
Reliability  
**100%**



Automatic functions improve safety

# The most intelligent winterization system on the market

**THE STARKICE SYSTEM** is based on intelligent sensors, a control center, logic centers, display units, and heating elements. The system provides a notification about freezing conditions, and activates the heating elements in an optimized manner. The system collects and saves information on the conditions and usage which can be transferred to any endpoint device.



**INTELLIGENT STARKICE ICE DETECTION SYSTEM** is in use with over 5,000 sensors around the world in freezing conditions and where operation must be ensured every day. The system provides reliability in highly demanding conditions and it meets the requirements of the PL c EN ISO 13849-1 standard.

DECKS AND PASSAGES



STAIRS



RAILS



SUPERSTRUCTURE



HATCHES



DOORS



PIPES AND TANKS



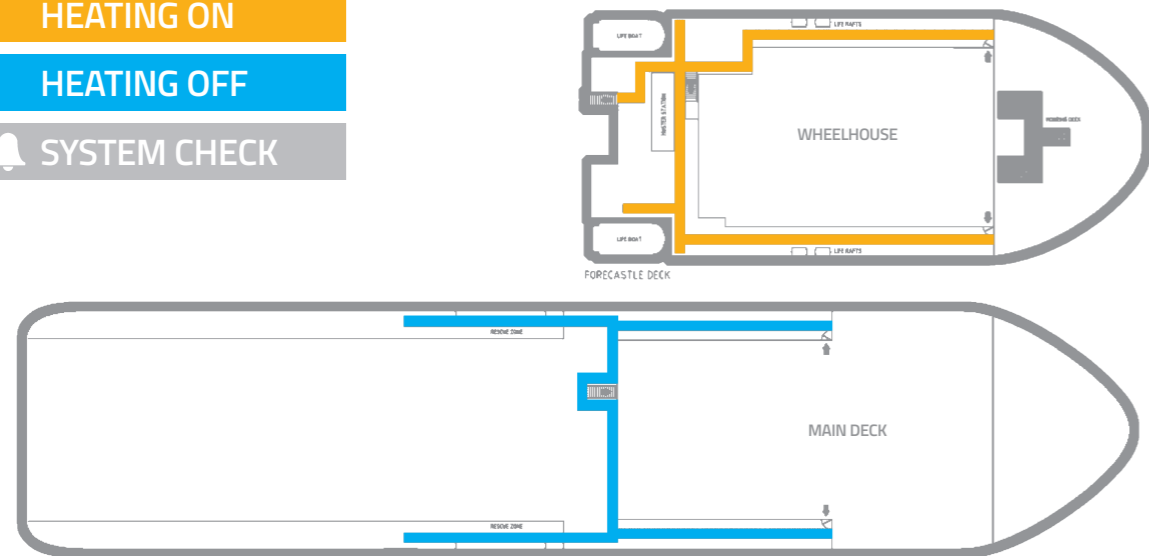
HELIDECK



# Starkice systems improve energy efficiency and safety



- HEATING ON
- HEATING OFF
- SYSTEM CHECK



STARKICE

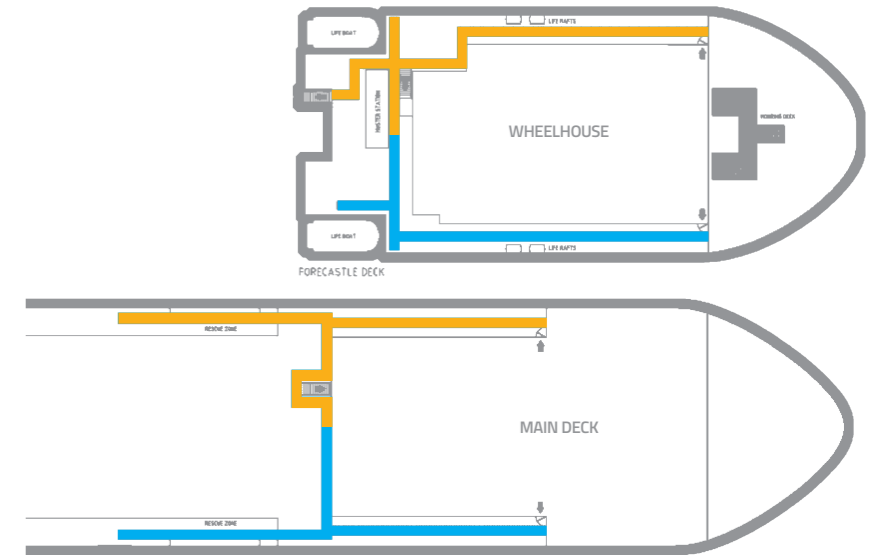


**AUTOMATION AND MONITORING IMPROVE SAFETY:** our system monitors the environment for freezing conditions 24/7. By utilizing this information, our intelligent system determines in which areas more power is needed and in which areas energy can be saved. The information is stored locally, and can automatically be transferred to cloud storage for easier utilization.

## COST SAVINGS

After several years of measurements and tests, we have created a winterization system that ensures a reliable operation even in the most demanding conditions. Without compromising safety, we want to keep the operating costs as low as possible by optimizing energy consumption.

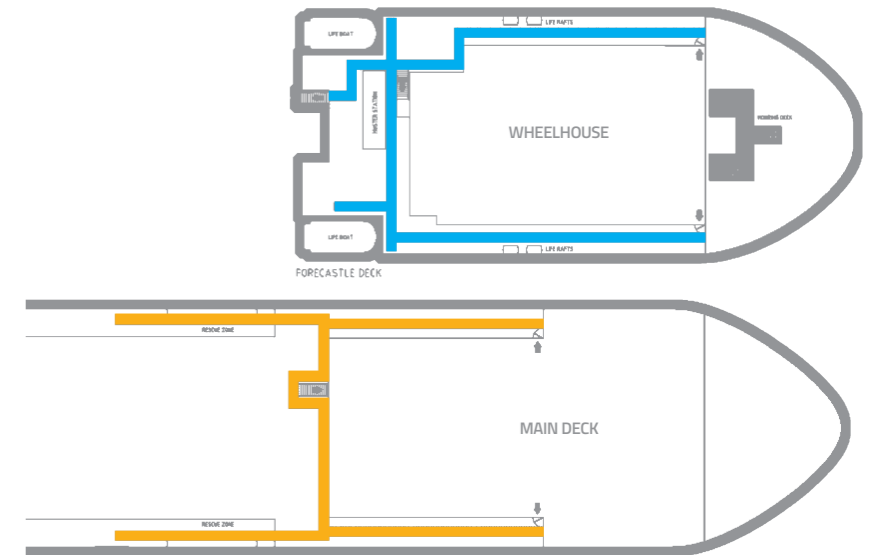
Our highly precise sensors send a notification to the system when ice is starting to form in a certain area. This enables activating the efficient heating elements in time, in order to prevent the forming of ice. If ice is starting to form only on one side of the vessel, the system focuses the power to that particular side. Intelligent, don't you think?



## EFFICIENCY

When you ship valuable cargo, reliability is your No. 1 priority. According to current and future requirements, the winterization system of vessels must meet all applicable standards and needs. When you have the Starkice system installed on your vessel, you can be sure that everything works according to plan.

The system ensures that all important devices and targets are available, when necessary. Crew resources are freed for other tasks, while the automatic system handles the de-icing.

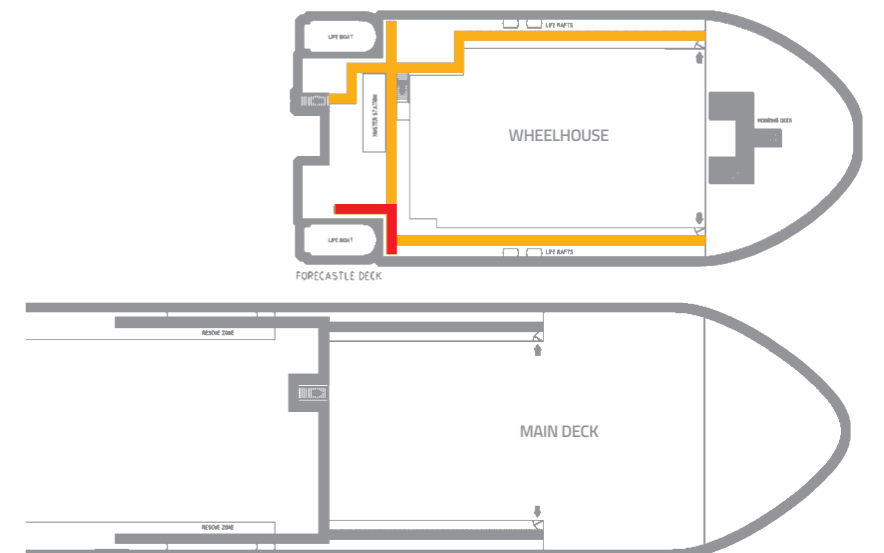


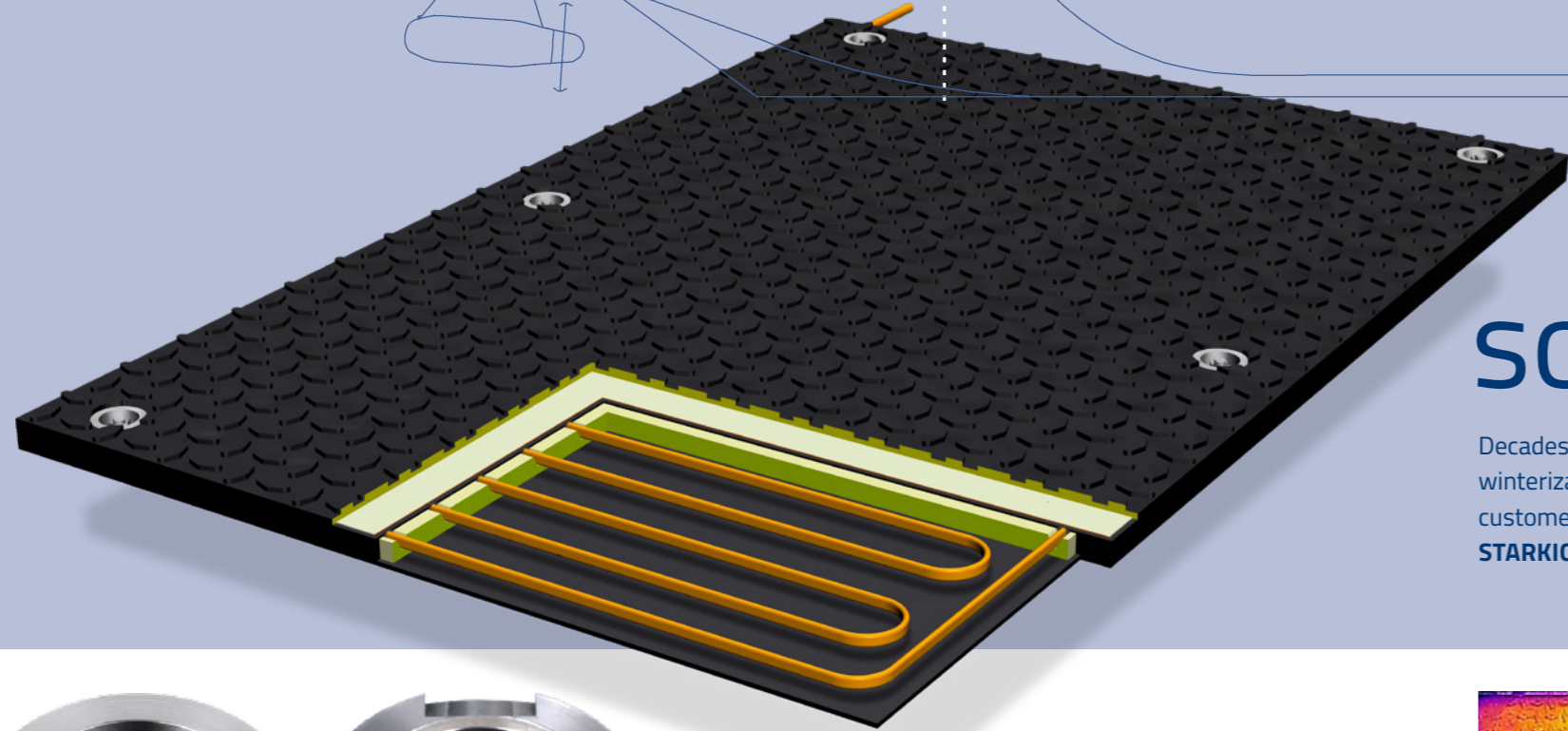
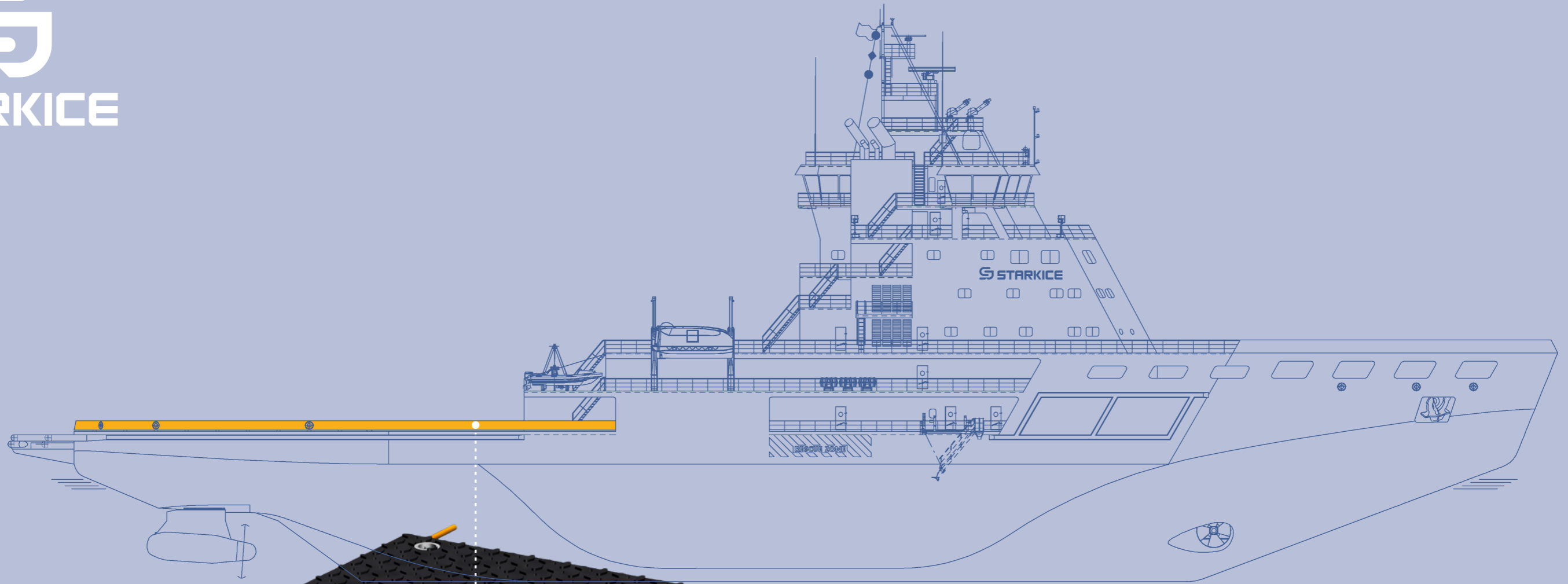
## SAFETY

The main focus of the Starkice system lies on safety. The safety of operations comes from heating passages, points of operation, hatches, and emergency exits.

Our product developers live in freezing Nordic conditions, so they know how products must function and what they must be able to endure.

A part of our daily work is to conduct the necessary tests in freezing temperatures, in order to ensure the safety of the crew, vessel, and cargo.





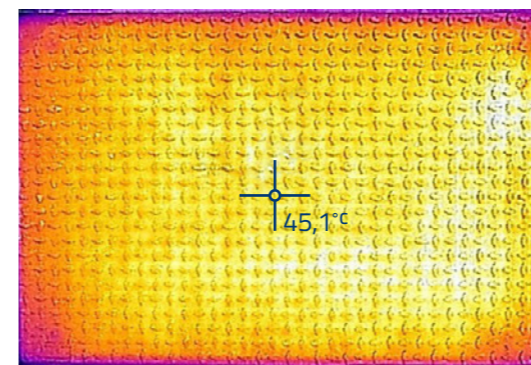
# Innovative solutions in the products

Decades of experience in the planning and development of Arctic projects and of the implementation of customer-specific winterization products has enabled us to provide you with our new intelligent de-icing system. We have listened closely to our customers and standardization organizations and this is a perfect result of our co-operation.

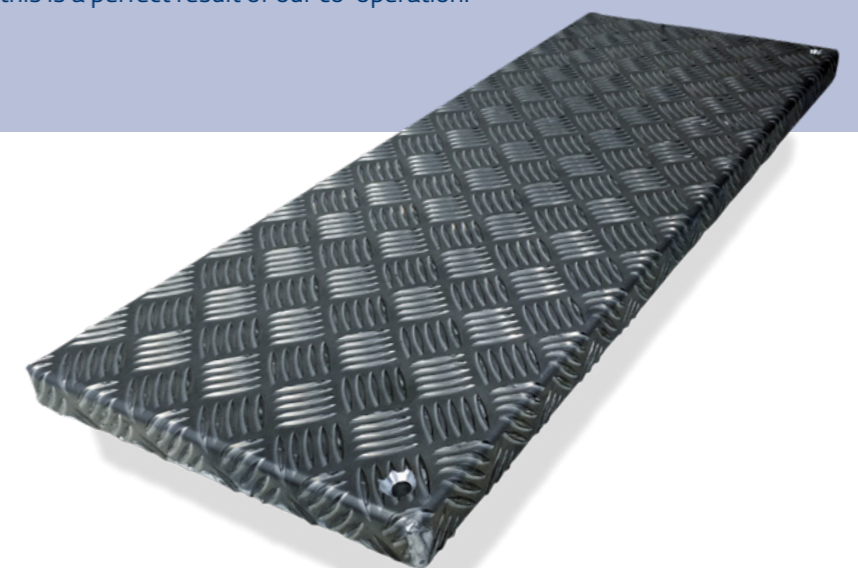
**STARKICE INTELLIGENT DE-ICING SYSTEM.**

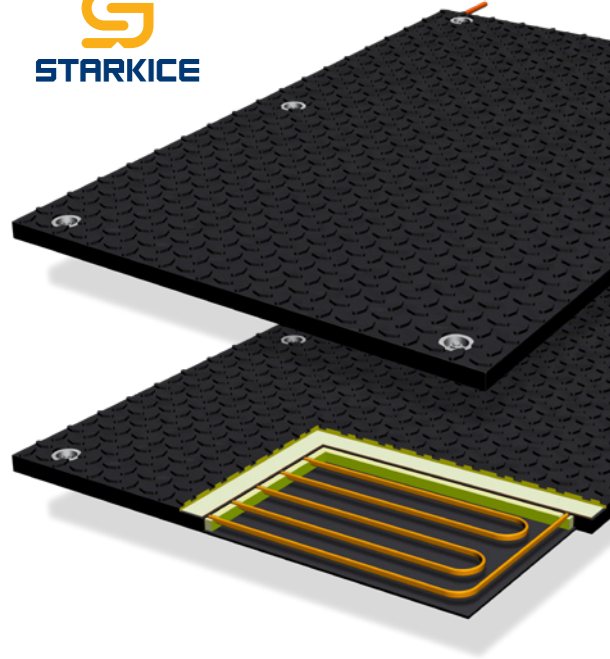


**THE STARKICE POLARPAD®** and **STARKICE MAG & STUD** reflect our history and experience. We believe the future is in the ease of use and safety of brilliantly designed product concepts.



An even temperature ensures a good grip even at -40°C.





## Starkice PolarPad®

Starkice PolarPad® is the most cost-efficient, durable, and reliable deck and stairs heating solution for marine and offshore use. PolarPad® has been specially developed for cold conditions and it meets all standards of the field.

The metal reinforcement in the internal parts of the system protects the heating source from external impacts. The flexible and heat-insulating base layer makes the system the most energy-efficient heating system on the market.

All surface materials are chosen to suit the extreme conditions. PolarPad® is made to endure heavy use, chemicals, and impacts. The optimized thermal conductivity of the surface ensures efficient de-icing.

- Suitable for any surface material
- Customizable for any shape and size
- Non-skid profiles
- Fast installation

### PolarPad® Grip

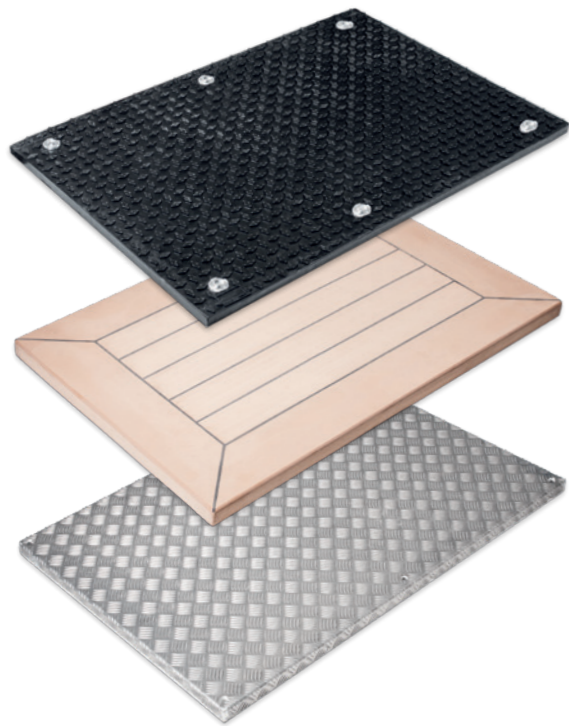
An infallible grip is guaranteed regardless of the weather conditions with the unique surface structure of PolarPad® Grip. The Grip model is made of chloroprene rubber and polyurethane.

### PolarPad® Teak

An exclusive imitation of wood to bring comfort in high-end targets. The material in Teak elements is synthetic polyurethane elastomere, and can be manufactured in any colour.

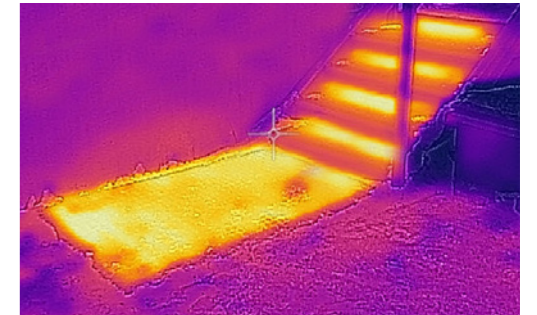
### PolarPad® Alu

The sturdy PolarPad® Alu with a ribbed surface texture is made of 3 mm thick marine aluminium.



## Starkice Step

Winterization of rescue routes and passages is the most important task of our system. We ensure that the crew and employees can exit safely and easily in emergency situations. The Starkice Step element makes sure that stairways are de-iced, dry and have a great grip even in icy rain.



## Starkice Mag and Stud

In order to facilitate installation of Starkice PolarPad®, we have developed innovative mechanisms for fastening the product on metal surfaces.

The Mag brackets enable installation with magnets by locking the bracket in place with a special key – without drilling or welding.

The Starkice PolarPad® can also be installed by traditional methods with bolts welded to the deck. The bolts can be welded while the element is in place, after which you just need to tighten the bracket.





## Starkice Intelligent De-icing system

The most reliable and intelligent winterization system on the market is developed for vessels, platforms, and terminals in cold areas. The system is used by operators who value reliability and cost savings.

The Starkice system detects conditions in which ice starts to form and can therefore optimize the use of power exactly where extra power is needed. Only necessary areas are heated. The system meets the requirements of the standard EN ISO 13849-1 PL c "Safety of machinery / Safety-related parts of control system".

The user interface options include touch pad control and cloud services. The device can be connected to several different systems.



## Starkice Rails

In heating handrails, we use an efficient energy-saving heating solution that ensures a perfect grip in cold conditions. The lead-throughs are completely hermetic and manufactured of acid-proof steel. Heated handrails are secure and have easy maintenance, as the heating elements are installed inside the structure.

The targets of use are rails, chutes, and sliding surfaces.



## Starkice ice detecting sensor

The sensor is designed to be used together with the control center of the Starkice system. Locations in cold areas freeze, which causes dangerous situations for both people and property. This can result in significant production losses.

Even a thin layer of ice on the surface of structures puts the reliable operation at risk and increases costs, which makes operating in demanding conditions even more challenging. In addition, masses of ice on the surface strain the structures and increase the need for manual de-icing.

With more than 5,000 ice detectors in use, we have gained over 19 million hours of usage experience. The system is based on this proven reliability.

The compact and robust sensor can be installed almost anywhere.



## Starkice Doors and Hatches

Doors and hatches must operate flawlessly 24/7. Formation of ice occurs naturally from opening doors and hatches, building up in seals, locking systems, and hinges.

The efficient and safe Starkice heating solutions for doors and hatches ensure their proper functioning in all situations.

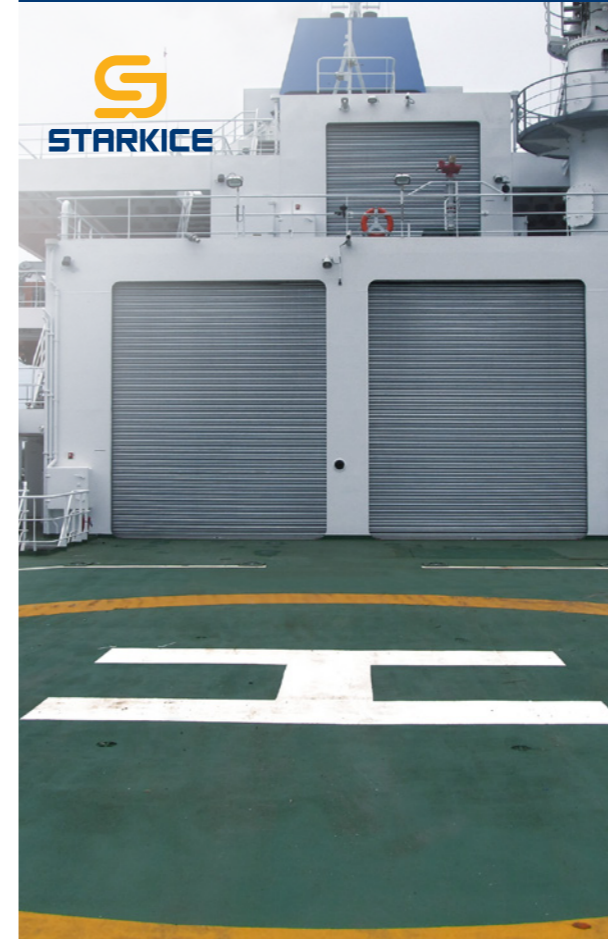






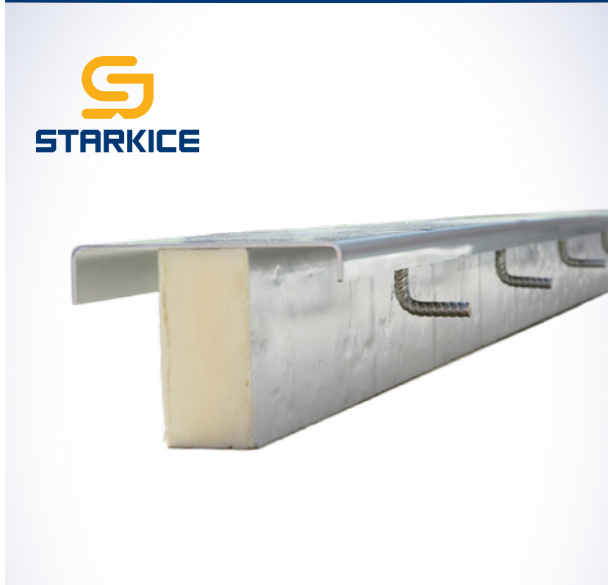
## Starkice Superstructure

Freezing of the structures has a significant effect on the operating condition of the vessel. In rough seas and Arctic freezing conditions, large surfaces freeze and accumulate huge masses of ice. This may pose a major risk to the operation of the vessel. With Starkice Superstructure heating, you can ensure that the surfaces remain ice-free, regardless of conditions. The heating elements are installed in the structures by using innovative brackets without a need for drilling or welding.



## Starkice Helideck

Landing platforms must be kept free of snow and ice at all times. With the Starkice Helideck heating system, you can ensure the safety of the crew and aircraft passengers. Our system is EX certified and thus it enables the refueling of helicopters on the landing platform. Easy installation enables the fitting of our heating elements on most helideck structures.



## Starkice Thermo Threshold

Sliding doors often have malfunctions in environments with ice formation. The customizable Thermo Threshold system secures normal operation and solves problems caused by ice. The materials are either AISI 316 acid-proof steel or heavy duty galvanized steel and insulated of EPS or urethane. Standard lengths are 2500, 3000, 4500, and 6000 mm. Other dimensions and an electrolytic polishing are available on request. Installation in concrete cast.

- Cuts off the cold bridge efficiently, saving energy
- Prevents the door and its weatherstripping from freezing to the threshold
- Keeps the threshold ice free and dry
- Affordable, energy-efficient and easy to install



## Starkice Cargo Hatch

The cargo hatches of the vessels must also function quickly and safely in cold conditions. The opening mechanisms of the trap hatches, roll grooves, and hydraulic pipings must be heated efficiently, in order to ensure timely loading and unloading.

Speed brings cost savings. Deck hatches can be heated with a heating system below the deck when the deck hatches do not allow using the Starkice PolarPad® heating elements.





## Starkice heating jackets

Our heating jackets, blankets and mats are made of a textile exterior, and heating elements inside the casing. All Starkice heating products are made of high-grade materials that ensure fluent operation even in the toughest environments. We have many different materials for all kinds of requirements and applications and a wide temperature range from 0 °C up to +900 °C with using quartz material. Fastening mechanisms include eyelets, hooks and velcro. Our heating products can also be manufactured for use in hazardous locations, or with an outer jacket of metal for durability in conditions with excessive load. Applications: Pumps, valves, pipeline strings, containers, barrels, hobbicks, drums, IBC's, motors, control devices and other appliances.

- Removable and replaceable
- Easy to mount, minimum installation time
- Long service life
- Optimal heat distribution



## Starkice heat tracing

In vessels, platforms, and terminals, fluids and pipings must be able to maintain a set temperature. The Starkice system ensures this with heat tracing cables and adjusting devices. We always plan the solution according to the customer's needs and provide the customer with a solution that meets all requirements stated in the relevant certificates and standards. By using the intelligent Starkice system, the heat tracing of pipings can be performed in varying heating conditions.



## Starkice heated blankets

The Starkice heated blankets protect and provide temporary heating. With its insulated structure, the Starkice heating blanket is efficient and economical. Easy installation and transferability make the blanket adaptable for different targets, according to the current need. The heated blankets come in various power and size options. After use they can easily be stored in a small space.



## Starkice heated hoses

Starkice heated pressure and analytic hoses are used for flexible transport of highly viscous or thicker media without heat loss. There are also suitable products for explosion-prone areas of zones 1 + 2 (gas) and zones 21 + 22 (dust). Each heated hose is configured according to customer specifications. Available holding temperature range is +5...+450 °C and hose widths 4- 100 mm.

Applications: Chemical, petrochemical and pharmaceutical industries, frost protection for water, fuel, oil, hydraulic liquids, gaseous media and food industry.

### Configuration example

- |                  |                       |
|------------------|-----------------------|
| 1. Inner liners  | 6. End caps           |
| 2. Sensor        | 7. Connection fitting |
| 3. Heating cable | 8. Connection cable   |
| 4. Insulation    |                       |
| 5. Outer jacket  |                       |





## Starkice living quarters

Offshore and marine heater with on/off-switch, thermostat and overheat protection. IP 44 classified, the Starkice LQH is a splashproof, rust-proof electric heater designed for use in damp accommodation such as bathrooms and WCs.

A powerhouse in a small frame, the Starkice LQH 16 offers an output of 1600W from an area of less than 2 sq. ft., while the surface temperature remains below the maximum limit stipulated for electric heaters. The heater features a grille at the top to prevent it from being covered, and an automatic thermal cut-out to avert overheating. Constructed in aluminium and stainless steel, the lightweight Starkice LQH is ideal for ships and offshore installations which impose space and weight limitations.

Starkice LQH is designed to be fitted as a fixture and must be installed in a horizontal position.



## Starkice communication and connection box heating

Starkice silicone heaters have a low thermal mass, making their heat transference exceptionally good. They are resistant to moisture and do not suffer moisture ingress associated with mineral insulated heating elements. Almost limitless range of shapes and sizes available. The adhesive backing makes installation fast and durable. Other fixings like hooks and springs, buckles, straps, velcro and magnetic backings are available.

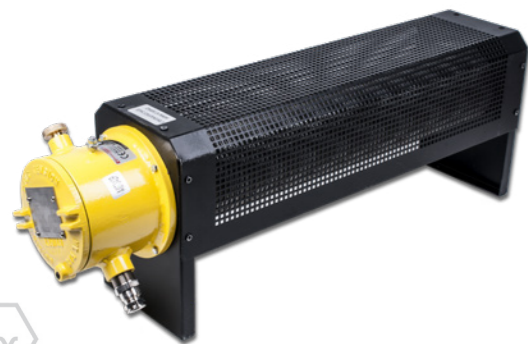
- Custom design
- Precise and even heating
- Flexible and lightweight
- Moisture and chemical resistant
- Wide temperature range: -60...+230 °C
- Fast response to temperature control



## Industrial EX hazardous area heaters

The Starkice Ex convection heaters are designed for use within Zone 1 or Zone 2 (T2...T6) ATEX certified hazardous areas. Heaters are constructed of 304 stainless steel heating elements with aluminum fins within a painted steel casing. Heaters are rated IP65/IP66 and can be provided with power outputs from 250W to 6200W (230V 1 Phase and 400V 3 Phase depending on temperature class and length) and is floor mounted as standard. An optional wall mounting kit is also available.

On request: for special applications all types are available in special voltages or different high-grade steel qualities, e.g. for food- or offshore-industry.



## Starkice Junction Box

Stainless steel junction boxes with IP 66 classification to protect electrical connections in offshore and onshore environments. Comes without pre drilled holes for inlets. Available with included support for DIN-rail or mounting plate. Sizes, material and other configuration are depending on application and requirements.





## KLIPSI® – Flexible magnetic holder

The KLIPSI® magnetic holder is especially designed for attaching cables to ferrite based steel surfaces.

The flexible bridge construction enables usage on curved surfaces, such as corners and edges. Depending on which side is facing upwards, the clip can fasten either thick or thin cables tightly.

The structure of the magnetic holder is completely waterproof, which inhibits the formation of a galvanic cell in damp conditions, preventing corrosion and oxidation of electronegative metals. The magnetic holder is manufactured from polyamide (PA 66), which endures extremely high strains and different temperatures and conditions.



## ÄSSÄ® – Magnetic holder

The ÄSSÄ® magnetic holder is a handy alternative for attaching cables to ferrite based steel surfaces. The holder works with trace heating cables and freeze protection.

The magnetic holder is manufactured from polyamide (PA 66), which can endure extremely high strains as well as varying temperatures and conditions.





an Aker Arctic company

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