A close-up photograph of a hand holding a large, irregular piece of clear ice. The background is a blurred view of a body of water with ice floes under a bright sky.

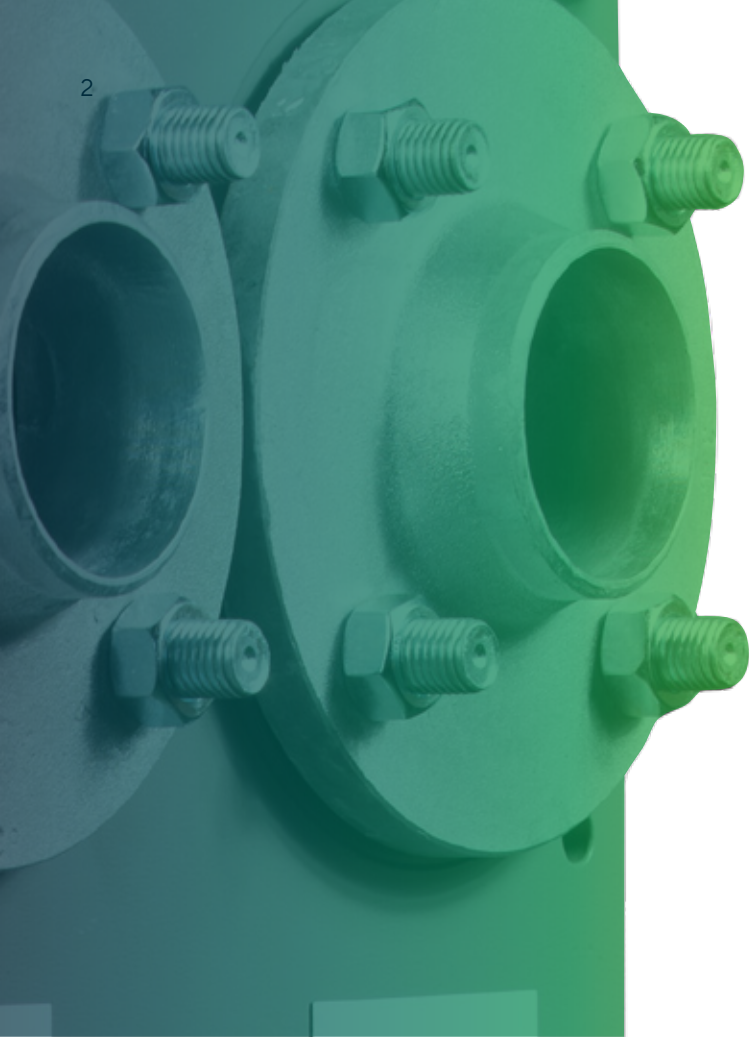
# Solving seawater cooling

MAINTENANCE-FRIENDLY MARINE COOLERS

PLEAT COOLERS

RACK COOLERS

TUBE COOLERS



HYDRONIQ COOLERS:

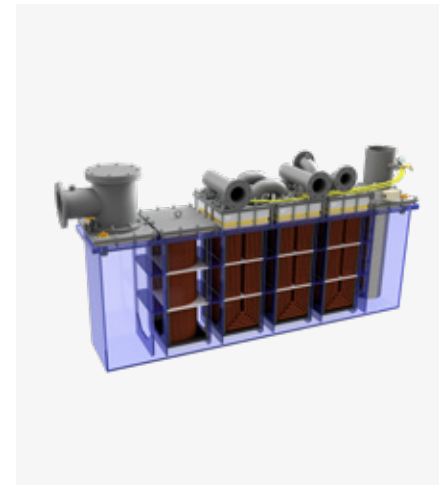
**Maintenance-friendly**  
**Up to date**  
**Significant savings**

*“By improving the proven through innovation and expertise, our goal is to maintain the edge in solving the challenges of seawater cooling”*

Our ambition at Hydroniq is to change the maritime industry's perception of how maintenance-friendly marine coolers can be,

and provide solutions that both benefit the environment and improve competitiveness for our clients.

Hydroniq Coolers product line



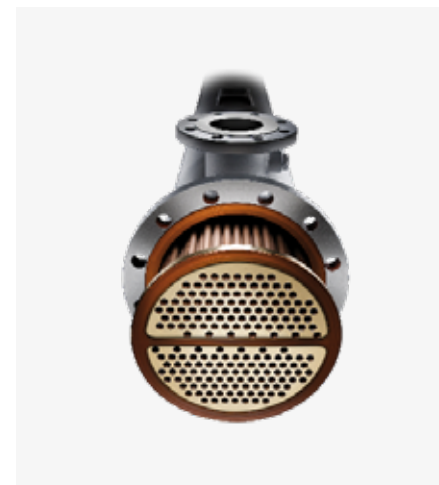
### Hydroniq Rack

The Hydroniq Rack cooler solution provides the benefits of both box and plate coolers – without the disadvantages of either system.



### Hydroniq Pleat

The Hydroniq Pleat cooler offers a maintenance-friendly and effective solution for central and auxiliary cooling. Flexible configuration allows one seawater system and multiple freshwater systems to be combined into one unit.



### Hydroniq Tube

Hydroniq has specialized its production of heat exchangers to enable customized solutions based on standard heat exchanger models. Hydroniq offers more than 200 standard models of shell and tube heat exchangers with cooling surfaces from 0.2 to 350 m<sup>2</sup>.



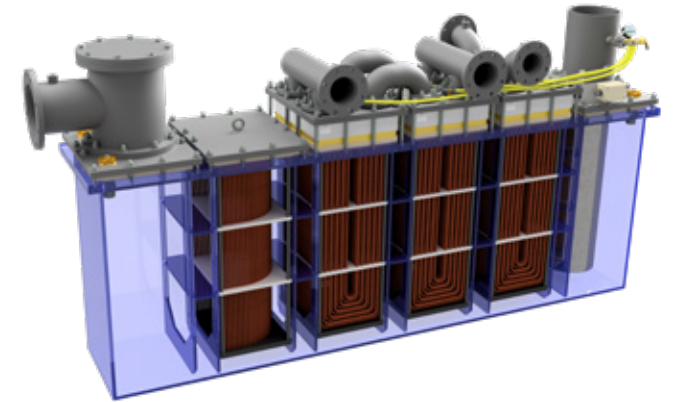
# Rack Coolers

## HYDRONIQ RACK COOLERS

### Benefits

#### Continuous and efficient cooling

The Hydroniq Rack cooler solution provides the benefits of both box and plate coolers – without the disadvantages of either system.



#### Reliable:

- Frequency controlled SW pumps ensure predictable cooling.

#### Energy saving solution:

- Reduced energy consumption on the seawater pumps (due to low pressure drop).
- Chilled-water element reduces the running hours of the chilled-water compressors.
- Heat-Recovery element makes it possible to use the surplus heat.

#### Saves space in the engine room:

- The system integrated into the vessel's steel structure (normally between frames in double-bottom).

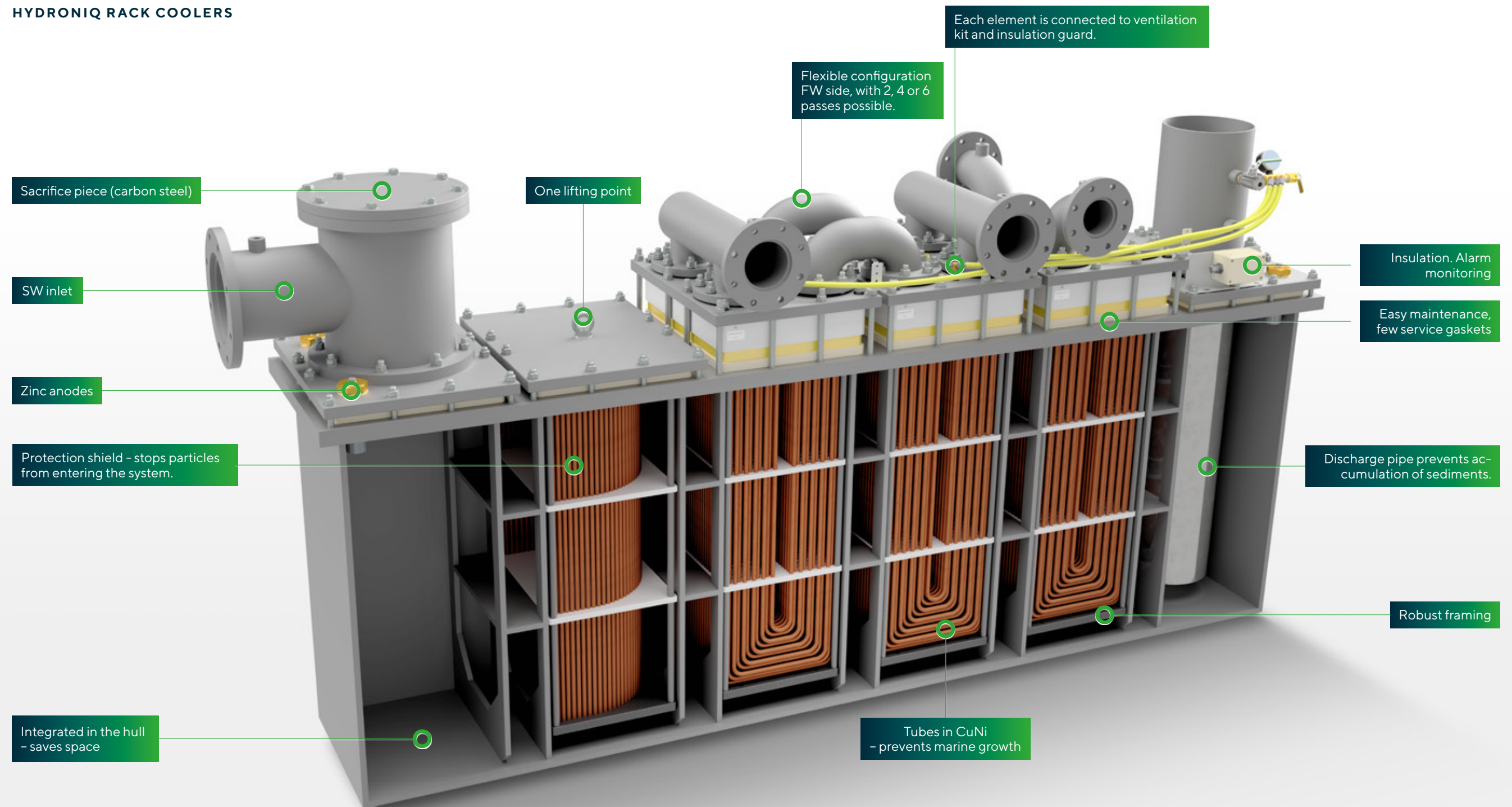
#### Maintenance friendliness:

- Tubes in CuNi prevent marine growth.
- Few service gaskets (low life cycle cost).
- No need for dry docking (compared to box-coolers).
- No galvanic corrosion (100% insulated from the hull-structure).

#### Standardized steel structure:

- Same steel drawings for different types of engines and equipment.

## HYDRONIQ RACK COOLERS





In-service performance

After 5 years  
in operation  
Before and after  
cleaning



Five-year class survey documents:

- no wear on tubes
- no corrosion in the housing/trunk/double bottom
- no leaking tubes
- no replacement bundles needed
- easy cleaning

Cleaning process performed onboard or quayside with environmentally friendly liquids.



Selected references





# Pleat Coolers

## HYDRONIQ PLEAT COOLERS

### Design

### Modern design, safe & easy maintenance

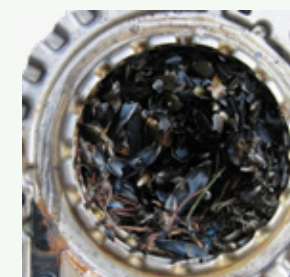
With Hydroniq Pleat coolers, the cleaning challenges related to seawater as a cooling source have been solved, with increased uptime for the vessel and enabling of efficient and problem-free working days for the crew. The Hydroniq Pleat cooler dramatically reduces maintenance costs for the vessel.



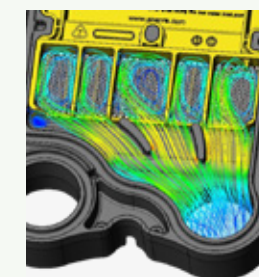
### Pleat Cooler benefits

- Flexible configuration, reduced space requirements.
- Possibility of combining one seawater system and multiple freshwater system into one unit.
- Longer cleaning intervals.
- Substantial reduction in maintenance hours and reduced downtime.
- A fraction of spare parts consumption
- Easier and safer maintenance.

Old technology



Pleat technology



Element size 1		Element size 2			Element size 3			
DN65	m²	DN80	DN100	m²	DN125	DN150	m²	DN200
1	1.8	1	1	5.8	1	1	9.1	1
2	3.6	2	2	11.6	2	2	18.2	2
3	5.4	3	3	17.4	3	3	27.3	3
4	7.2	4	4	23.2	4	4	36.4	4
5	9.0	5	5	29.0	5	5	45.5	5
6	10.8	6	6	34.8	6	6	54.6	6
	12.6	7	7	40.6	7	7	63.7	7
	14.4	8	8	46.4	8	8	72.8	8
	16.2	9		52.2	9	9	81.9	9
	18.0	10		58.0	10	10	91.0	10
				63.8	11		100.1	11
				69.6	12		109.2	12
							118.3	13
							127.4	14
							136.5	15

Design pressure 6 bars, design temperature 0–95° Celsius.



HYDRONIQ PLEAT COOLERS

Safe and easy maintenance



Cleaning

Open elements reduce cleaning time by more than

90%

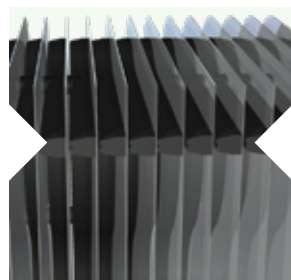


Sealed at first attempt

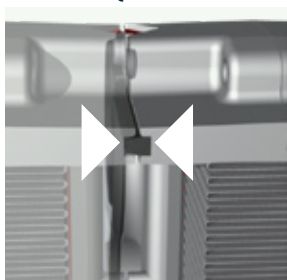
No more trial and error!

Hydroniq Pleat coolers are designed with mechanical stops, for a torque-independent approach.

PLATE HEAT EXCHANGER



HYDRONIQ PLEAT COOLER



HYDRONIQ PLEAT COOLERS

Selected references



# Case study - Tug vessel in Singapore Bay

## How does two Hydroniq Pleat coolers perform on board a tug vessel in Singapore Bay?

The vessel also has two existing Plate Heat Exchangers (PHE), making it easy to compare maintenance cost over a year. The cost is based on new Pleat coolers, retrofit installation, maintenance, service and spare parts, and shows great savings by investing in Hydroniq Pleat coolers.

“Before installing the Hydroniq Pleat coolers, substantial time and effort was spent on dismantling the pipes and cleaning the PHE coolers nearly every week. Per annum a total of 2500hrs were spent on maintaining the cooling system for 12 Tugs. With the new Hydroniq Pleat coolers installed we were able to extend the cleaning program by 10mths for each vessel. This has significantly reduced resource costs and downtime for the vessel owner.”

JEFFERY SIM, HEAD OF CORPORATE COMMUNICATIONS AT PSA CORPORATION LIMITED

### Quick return on investment

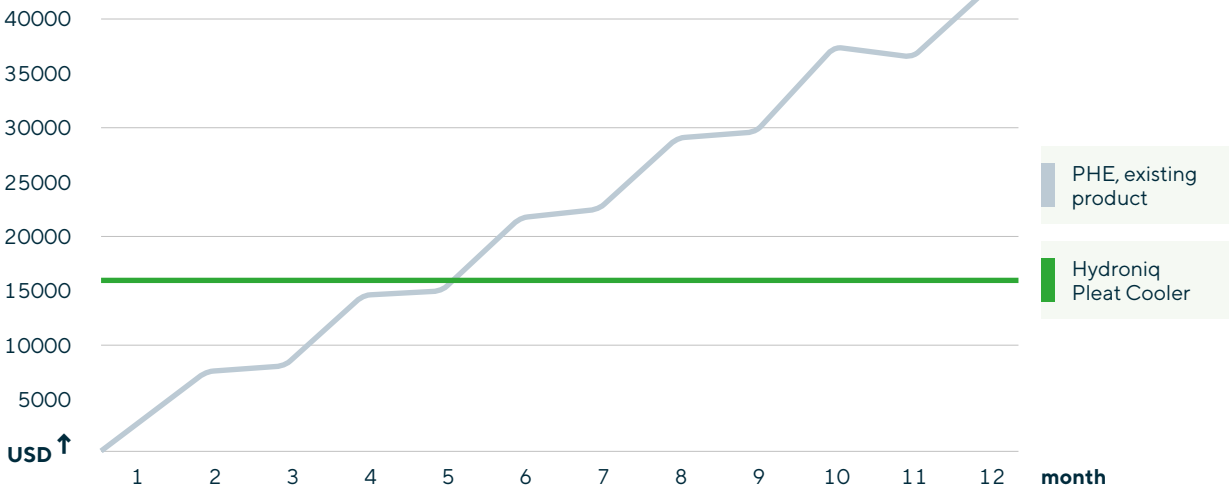


PLATE HEAT EXCHANGER (PHE)

240 MAN-HOURS

45 GASKETS

50 OFF-HIRE DAYS

HYDRONIQ PLEAT COOLER

1 MAN-HOUR

1 GASKETS

0 OFF-HIRE DAYS

- Maintenance free design
- Maintenance cost reduced by about 90% (hours and gaskets)
- Cleaning time typically reduced from 8 hours to 1 hour
- One element equals about 15 conventional plates
- Easy to dismantle and assemble
- No special skills or tools required



## HYDRONIQ TUBE COOLERS

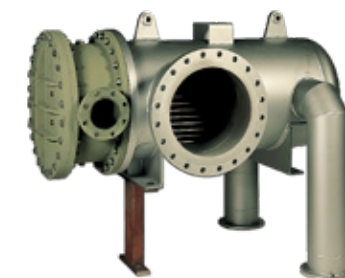
## Design

### High quality and long lifetime

Hydroniq has specialized its production of heat exchangers to enable customized solutions based on standard heat exchanger models. Hydroniq offers more than 200 standard models of shell and tube heat exchangers with cooling surfaces from 0.2 to 350m<sup>2</sup>.



# Tube Coolers



#### Standard range:

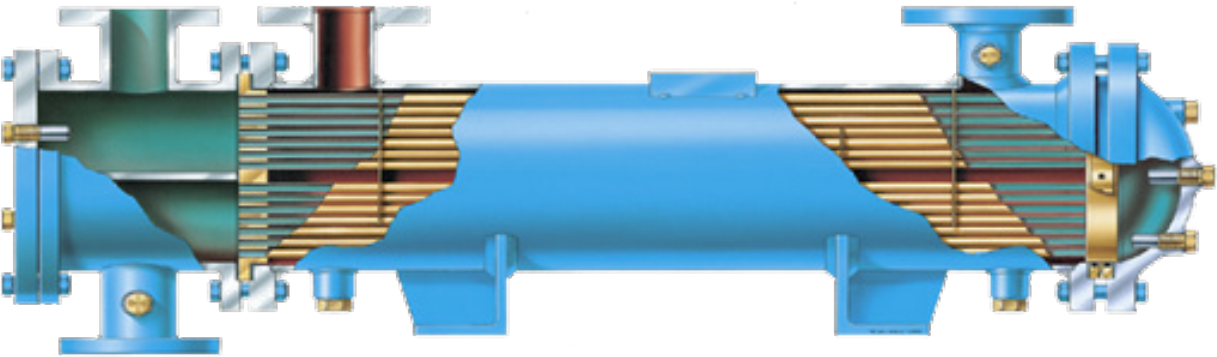
**6** basic designs / **150** models  
0.2 – 350 m<sup>2</sup>

#### Tailor made:

- High pressure
- Special designs
- Retrofit other brands
- Short delivery time
- Flexible design



Materials



- Tubes:**

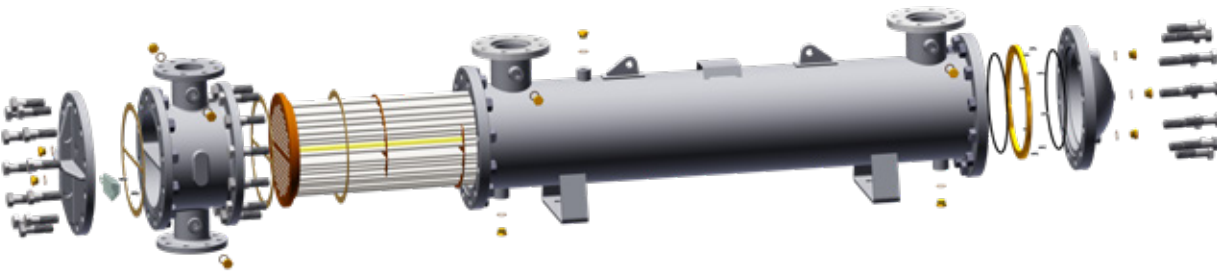
  - Alu. brass
  - Cu/Ni 90/10
  - Cu/Ni 70/30
  - Carbon steel
  - Stainless steel
  - Titanium
- Tube sheets:**

  - Munz metal
  - Stainless steel
  - Titanium
- Baffels:**

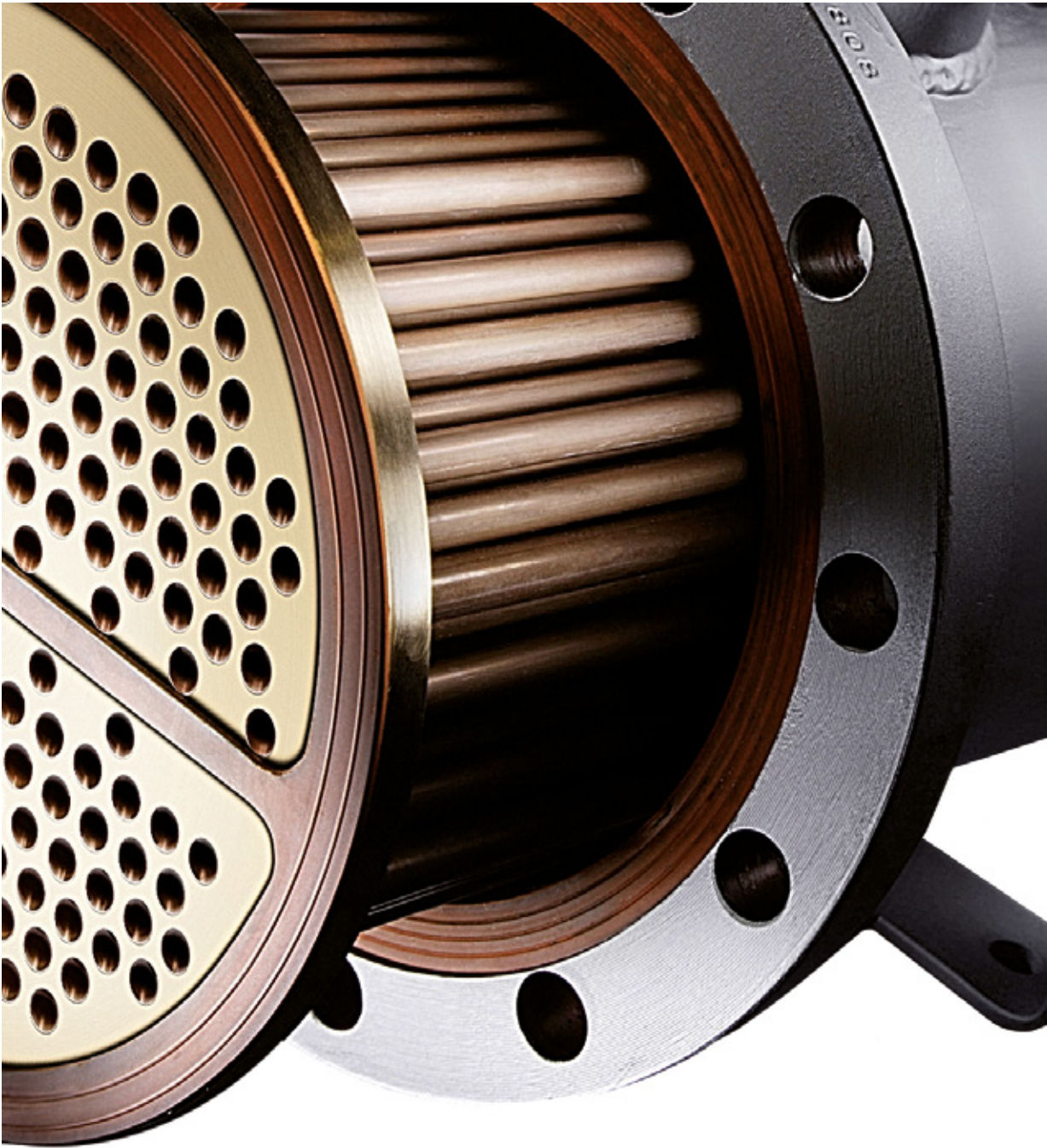
  - Munz metal
  - Stainless steel
  - Titanium
- Water boxes:**

  - Nodular iron
  - Bronze
  - Stainless steel
  - Titanium
- Shell:**

  - Carbon steel
  - Stainless steel
- Other materials on request



Hydroniq has delivered shell and tube coolers for the marine market since the early 1970s. We deliver a proven concept manufactured to allow thermal expansion without causing leaks or other damages.



Some of our references





# After- market Service

## HYDRONIQ AFTERMARKET SERVICE

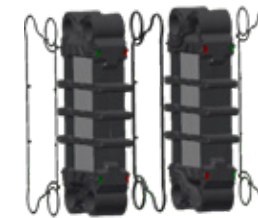
### Genuine spare parts

Hydroniq guarantees that we will keep parts and accessories in stock for at least 30 years from the installation of your heat exchanger.

No matter if your heat exchanger is 2 or 30 years old – we will supply you with genuine Hydroniq spare parts.

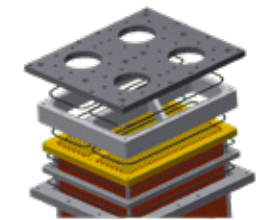
THE HYDRONIQ  
**30 YEAR  
WARRANTY**

HYDRONIQ'S INNOVATIVE PLEAT AND RACK COOLER CONSTRUCTIONS ARE DESIGNED FOR SUPERIOR PERFORMANCE AND EASY MAINTENANCE



#### Maintenance friendly

Our range of pleat coolers have only one service gasket for each element.



#### Low life cycle cost

Hydroniq rack coolers have few service gaskets and a low life cycle cost.

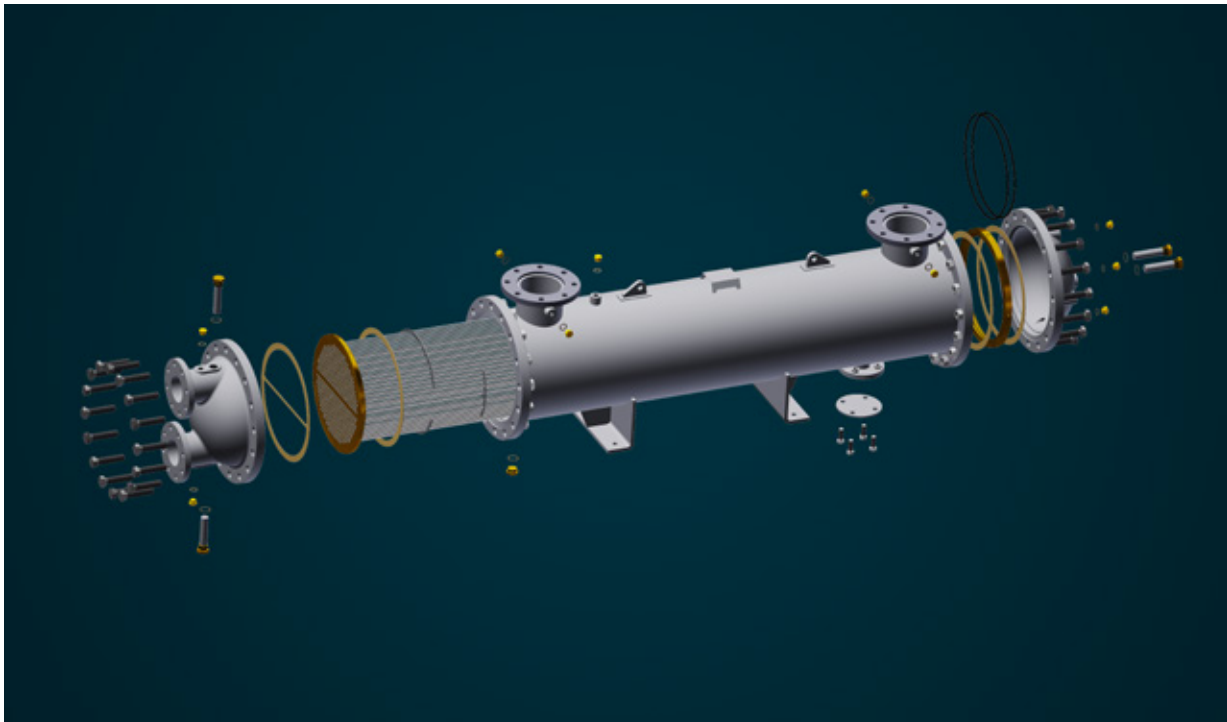
### Hydroniq Express Service

Our goal is to live up to our heritage of delivering *Any part to any place within 48 hours*. We keep all standard off-the-shelf parts in store for 30 years. Replacement bundles are ready for shipping within 5 working days from order.

# Prevent costly repairs

Preventive maintenance is essential to maintaining vessel equipment that yields top performance.

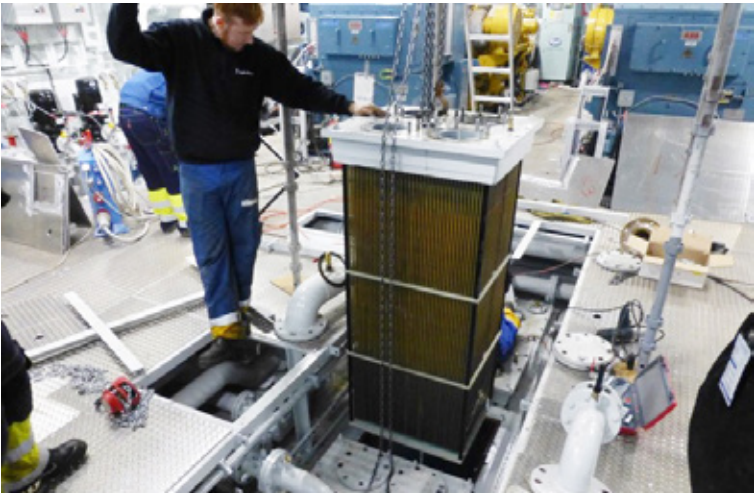
Avoid more costly repairs by changing zinc anodes every 3 months or as required to prevent wear and tear. Following the Hydroniq maintenance routines and using genuine Hydroniq spare parts gives you low life cycle costs and easy maintenance.



## Services

Our service team provides our customers with:

- Service labour
- Supervision during drydocking
- Repairs and overhauling
- Cleaning and reconditioning



# Immediate response to your enquiries:

IN ORDER TO KEEP OUR 48-HOUR DELIVERY PROMISE

## Please provide the following information

<b>Your request:</b>	Enquiry / Order / Other
<b>Who:</b>	Full company details: Name, address, phone, e-mail and contact person
<b>Billing Details:</b>	Full company details including contact person
<b>Delivery:</b>	Delivery address and requested delivery date, name of ship
<b>Equipment Section:</b>	Type of heat exchanger including serial number
<b>Line Items:</b>	What parts are needed, incl. Hydroniq part numbers

Important: To ensure correct and quick delivery we need the serial number of your heat exchanger.

## Ordering spare parts via portals:

Hydroniq processes enquiries and orders through marine portals, such as *ShipServ*, as efficiently as direct enquires and orders.  
Contact us at: [service@hydroniq.no](mailto:service@hydroniq.no)

ShipServ ID: 228304

## Contact us for spare parts:

Hydroniq Aftersales & logistic  
TEL: +47 70 10 42 00 | E-MAIL: [SERVICE@HYDRONIQ.NO](mailto:SERVICE@HYDRONIQ.NO)

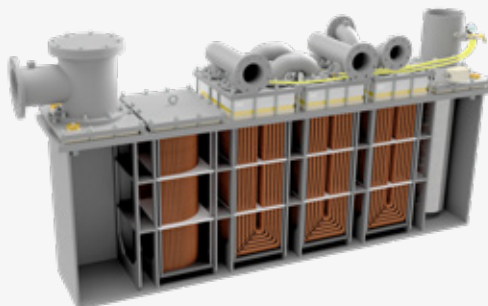
[WWW.HYDRONIQ.NO/SERVICE](http://WWW.HYDRONIQ.NO/SERVICE)





## Pleat Cooler

Hydroniq Pleat coolers have many similarities with conventional plate coolers, which have been widely used in the marine industry for decades. But there is one major difference; ease of maintenance. All heat exchangers need to be disassembled and cleaned periodically to prevent pressure drop due to fouling and other pollutants. With Hydroniq Pleat coolers, the cleaning challenges related to seawater as a cooling source have been solved, with increased uptime for the vessel and enabling of efficient and problem-free work days for the crew. The Hydroniq Pleat cooler gives dramatically reduces maintenance costs for the vessel.



## Rack Cooler

The Hydroniq Rack cooler is a central cooler normally placed in the double bottom of the vessel to save space in the engine room. The Hydroniq Rack cooler has a number of U-bundles with CuNi-tubes to prevent marine growth, and uses forced seawater flow outside the tubes and fresh-water inside the tubes.

The Hydroniq Rack seawater cooling system is very energy efficient. Reduced energy consumption means less emissions and lower operating costs for the vessel, thereby contributing to both environmentally and financially responsible operation.



## Hydroniq Coolers

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