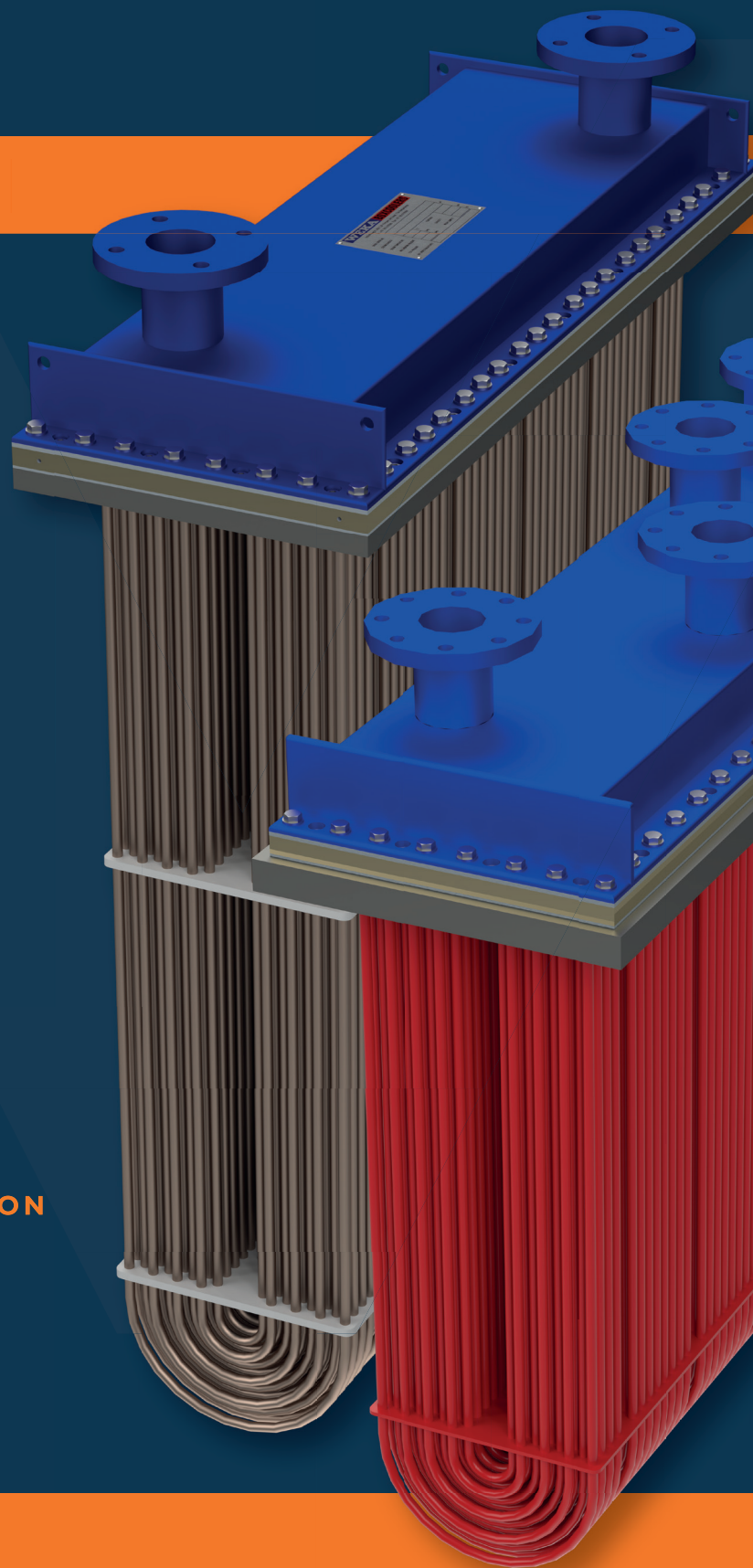




BOX COOLERS

PRODUCT CATALOG



► **FOR MORE INFORMATION
VISIT OUR WEBSITE**

SCAN THE QR CODE AND
GO TO THE INFORMATION PAGE

► **WWW.WEKAMARINE.COM**

Oceans of experience in heat exchange - Since 1957

Weka Marine is a pioneer and expert in maritime heat exchangers. We stand as a prominent global manufacturer of heat exchangers, boasting a rich history of delivering solutions for a wide range of maritime applications since 1957. Since the beginning, Weka has been involved in the maritime industry as maintenance and repair company. In the 1970s Weka pioneered its first (steel) box cooler, and later added our well-known signature product the copper-nickel box cooler, focusing on tailored and environmental solutions for the maritime industry.

Our extensive selection of maritime heat exchangers is among the most comprehensive worldwide, positioning us as a renowned partner. Our product portfolio encompasses Box coolers, Keel Coolers, Steel Boxcoolers and Laser Plate Heat Exchangers.

Years of experience and profound expertise have solidified our status as specialists in this field. Weka has pioneered unique solutions, we design our heat exchangers with precision, tailoring them to meet the specific requirements of each machine or equipment system. This dedication ensures exceptional energy efficiency and reliability across all market segments. By choosing Weka Marine as your Maritime heat exchange partner, you are reducing long-term operational costs.

We understand the significance of outstanding, flexible and dependable after-sales services to our customers. We are committed to working closely with you, providing continuous support throughout the entire lifecycle of your vessel and equipment, thus ensuring enduring business success.

Weka Marine



In the beginning - A factory near the river

Weka Marine B.V., headquartered in Krimpen aan den IJssel, the Netherlands, has a rich and storied history that spans several decades. The company's evolution reflects its commitment to excellence in the marine cooling.



Early Beginnings:

The name Weka is coming from the two last names of our founders, Arie Westbroek and Cornelis de Kwant. Weka Marine's origins can be traced back to the mid-20th century. Founded as a small workshop, it initially specialized in various metalwork, catering to the needs of local maritime businesses along the bustling waterways of the Netherlands. These early days laid the foundation for the company's future growth and success.

Diversification and Innovation:

As the maritime industry continued to evolve, Weka Marine recognized the need for diversification and innovation. The company began exploring new avenues, particularly in the field of marine equipment and heat exchanging systems. This marked a turning point in Weka Marine's history, as it shifted its focus towards becoming a leading provider of cutting-edge cooling solutions for vessels.

Becoming a specialist in Marine Cooling Solutions:

Weka Marine's commitment to excellence in marine cooling solutions became evident in its ability to design and manufacture high-quality, reliable marine equipment. It specialized in critical cooling systems such as box cooler, keel coolers, steel coolers, etc. for a broad spectrum of marine applications. This specialization allowed Weka Marine to establish a reputation for delivering top-tier products that met the stringent demands of the maritime sector.



Global Presence and Industry Recognition:

Over the years, Weka Marine's footprint expanded beyond the Netherlands, and it began serving a global clientele. The company's reputation for excellence in heat exchangers garnered recognition not only in Europe but also worldwide.

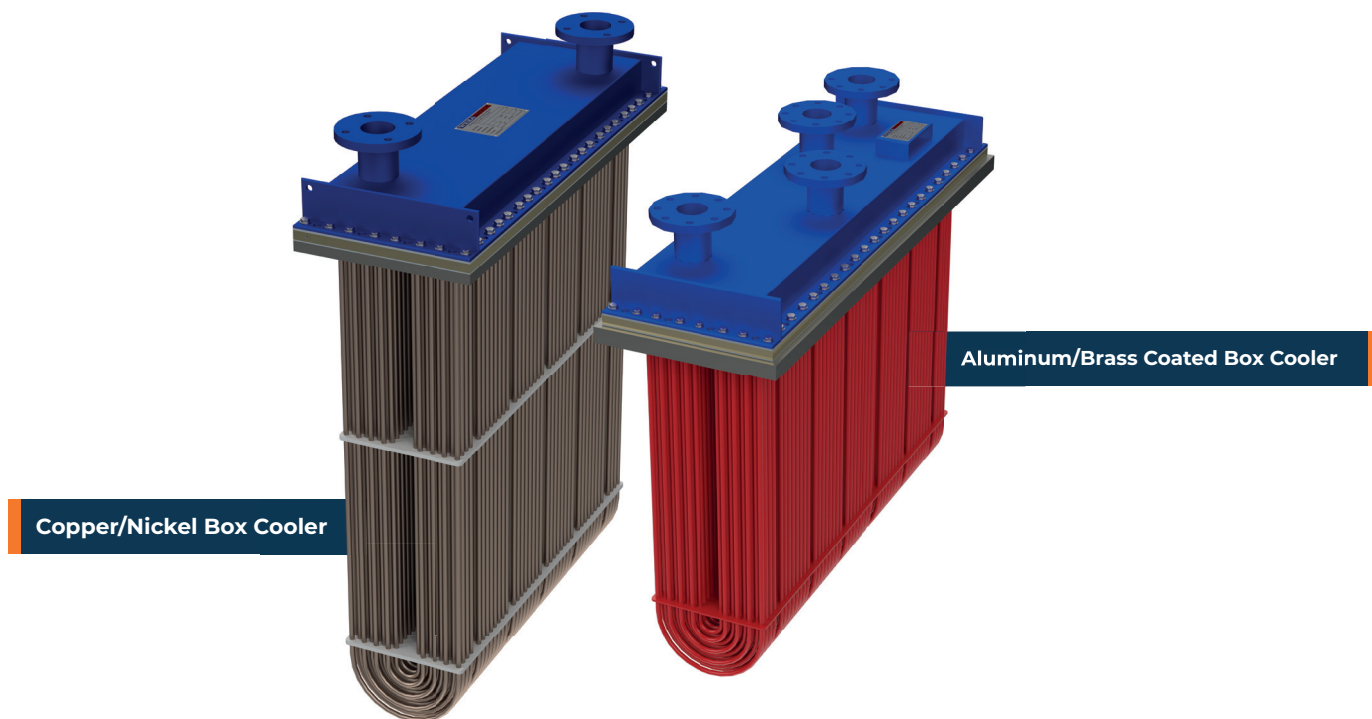
Fernstrum group of companies:

After a fruitful partnership over a period of 25 years, Weka Marine became part of the Fernstrum group of companies in 2013. Resulting in a broad range of cooling solutions.



WEKA Marine B.V.

Today, Weka Marine B.V. stands as a leading and respected player in the maritime industry, known for its innovative and pioneered solutions, exceptional customer service, and dedication to reliability and quality. Its history reflects a journey of continuous growth and adaptation, demonstrating its ability to thrive in an ever-evolving industry while keeping pace with the evolving needs of the maritime sector. As Weka Marine B.V. moves forward, it remains committed to its legacy of excellence and its role as a pioneer in marine solutions.



Stay Cool, Sail Cool

Maintaining optimal operating conditions for marine engines and onboard systems is paramount to ensure the efficiency and performance of vessels. With a wealth of experience spanning decades, Weka Marine specializes in providing rugged heat exchangers capable of withstanding the harsh conditions of the open seas.

Among our extensive range of solutions, the box cooler stands out as a top choice for maritime applications. Meticulously designed for this demanding environment, it offers efficient and robust cooling, ensuring reliability over an extended service life. The box cooler features a U-tube bundle, ingeniously fitted into the sea chest on the vessel's side, effectively saving space within the engine room.

The sea chest is thoughtfully equipped with inlet and outlet grids, facilitating the cooling process. Cooling seawater enters through the inlet grid, courses along the U-tube bundle, and exits through the outlet grid, effectively lowering the temperature of the water within the tubes. This cooling mechanism is achieved either through forced circulation of seawater when the vessel is in motion or by natural convection when it's stationary.

A significant advantage of box coolers is their ability to function without the need for an entire external water circuit, including sea water pumps, filters, valves, pipelines, and associated components. Since seawater serves as the cooling medium, our box coolers are constructed using anti-corrosive materials, ensuring durability in marine environments. Furthermore, this heat exchanger type is virtually maintenance-free and can be tailored to meet specific operational conditions and temperature requirements.

In areas where biological fouling could pose a challenge, Weka offers specialized anti-fouling solutions to address these concerns. Our commitment to providing reliable and efficient cooling solutions in the maritime sector remains unwavering, backed by our wealth of experience and dedication to quality and performance.

WE UNDERSTAND
THE OCEAN



Cooling solutions

Weka Marine's box coolers stand as the optimal choice for small and medium-sized vessels, encompassing a broad spectrum of vessels, including tugboats, barges, fishing boats, carriers, dredgers, supply vessels, ferries, icebreakers, cargo freighters, tankers, and reefers. Box coolers provide versatile temperature control solutions, serving various functions from cooling main engines, auxiliary engines, and bow thrusters to regulating air conditioning and hydraulic systems.

Our range of box coolers offers flexibility in terms of size, shape, and configuration to suit specific cooling capacity requirements. A prominent application for our box coolers involves efficiently dissipating waste heat generated by diesel engines and other heat sources like charge air coolers, lube oil coolers, and gear oil coolers.

Weka Marine prides itself on the innovative technology that underpins our high-performance box coolers. Years of dedicated innovation and engineering excellence have led to the development of these top-tier solutions. This commitment drives our continuous efforts to enhance and optimize the mechanical design and thermal performance of our products, ensuring they meet the exacting demands of our valued customers, the evolving market, and classification societies across the globe.



Chang Jiang Kou 01 | During Sea Trials

Boxcoolers are suitable for the following vessel types:

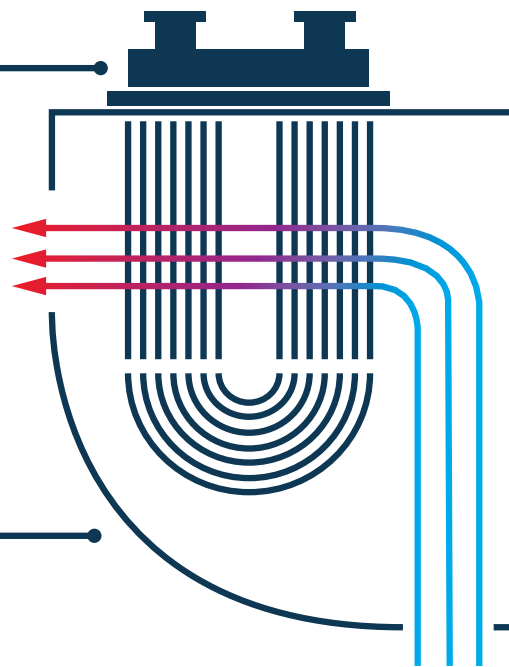
- Tugboats
- Fishing boats
- Barges
- Construction vessels
- Carrier vessels
- Offshore vessels
- Hotel & Hospital vessels
- Navy & Coast guard vessels
- Small & Medium tankers
- Cargo Ships
- Carriers
- Dredgers
- Ferries
- Ice Breakers

Our box coolers at Weka Marine are celebrated worldwide for their low maintenance requirements, space-saving design, extended service life, and exceptional availability. These qualities have earned us a dedicated global customer base.

FUNCTION AND PRINCIPLE



BOX Cooler



SEA Chest

ENGINEERED TO COOL IN ALL CONDITIONS

General box cooler key benefits

- Eliminates on-board sea water system
- Less susceptible to corrosion and fouling
- Can operate in icy conditions, silt or polluted waters
- Low maintenance
- Space-saving in the machine room
- Low operational costs

In comparison to other marine cooling systems, the box cooler offers distinct advantages. It demonstrates a significantly reduced vulnerability to corrosion from seawater and is less prone to fouling caused by barnacles, molluscs, algae, seaweed, and bacteria. Especially our Copper/Nickel cooling solutions are particularly well-known for these natural anti-fouling capabilities.

Moreover, the box cooler eliminates the necessity for a complete outboard water circuit, which typically includes components like sea water inlet pumps, sea water filters, valves, pipelines, and various parts all requiring construction with sea water-resistant materials. This, coupled with the box cooler's low maintenance characteristics, results in notably lower operational costs when compared to alternative solutions.

When it comes to navigating icy conditions, box coolers prove highly suitable. They exhibit a robust performance even in freezing water, eliminating concerns about potential damage. The presence of brash ice poses no issue for box cooling systems; it tends to melt shortly after the engines are initiated. While precaution should be taken to prevent freezing in the tubes, using anti-freeze is a recommended measure.

In addition to their ice-handling capabilities, box coolers are the preferred choice for vessels operating in shallow, sandy, and silt-polluted waters. This preference arises from the smoother flow dynamics around the external surface of the box cooler, which is notably more efficient than the pumped and forced flow systems.



THE POWER OF
COPPER/NICKEL

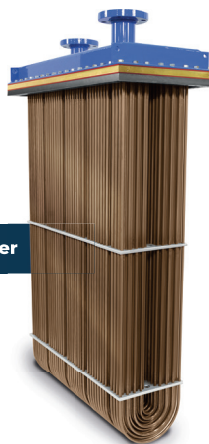
Tailored Technology for your needs

The versatility of the Weka Box Cooler is equally matched by its cooling prowess. Its straightforward design can be adapted into various configurations and shapes to precisely fit available space and cooling demands.

A typical box cooler features a U-shaped tube bundle, firmly secured with a tube sheet and a waterbox to guide the flow of water. This bundle is fastened with a gasket to a mounting frame, anchoring the cooler to the vessel's hull. This construction technique enables the removal of the waterbox while keeping the bundle fixed to the hull, preventing seawater from entering the vessel when the cooler is in use.

To cater to a broad spectrum of cooling requirements and diverse structural limitations, Weka Box Coolers are available in multiple configurations, encompassing both round and rectangular designs.

Rectangular Box Cooler



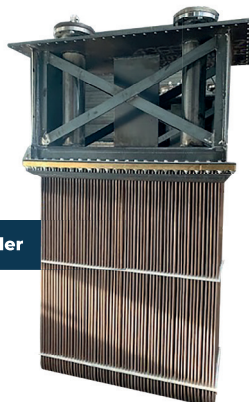
Round Box Cooler



Stepped Box Cooler



Extended Box Cooler



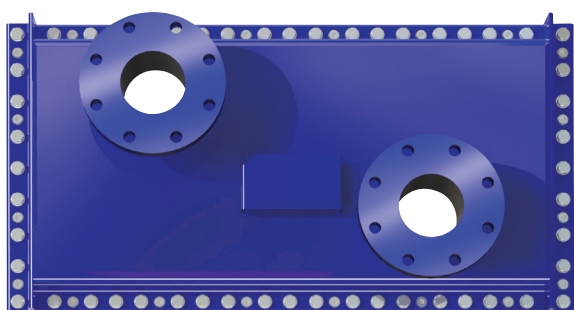
- Conversely, the rectangular form is tailored for higher cooling capacities, covering surfaces spanning from 9 to 120 square meters. The width of the box cooler bundle extends to about 400 millimeters, with a maximum length of approximately 2000 millimeters.
- The round shape primarily suits applications with lower cooling capacities, offering cooling surfaces ranging from 2 to 21 square meters. The maximum feasible bundle diameter is approximately 400 millimeters.
- Recognizing that available space in the sea chest is frequently limited, the bundle must closely conform to the hull's contours to maximize the cooling surface. This is achieved by employing a stepped bundle approach in multiple sections, each with varying depths.
- In the pursuit of maximizing the cooling potential of a box cooler within a sea chest, it is essential for the bundle to establish complete contact with the surrounding water. This objective is readily achieved by extending the sea chest, resulting in several noteworthy advantages, such as: Tailored to Sea Chest Geometry, Ideal for
- Dredging Operations, Maintenance Ease.

Irrespective of the design, Weka Box Coolers are engineered to order with bundle depths ranging from 400 to 2400 millimeters. For more extensive specifications, larger types can be made available upon request.

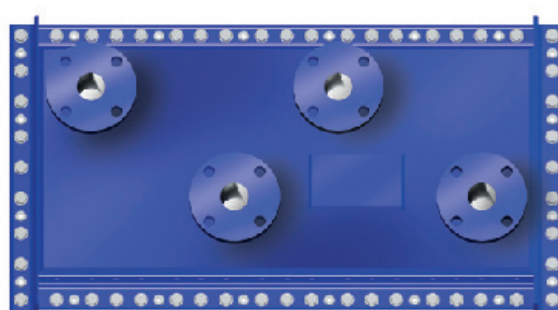
Double Circuit & Redundancy arrangements

When the need arises to cool two distinct water circuits or when redundancy is a requirement, it becomes feasible to furnish the box cooler with dual compartments. This configuration allows for two separate circuits to be accommodated within a single box cooler, effectively minimizing the space constraints.

For the redundancy version, these two compartments can be operated either in parallel or in series, contingent upon the installation of supplementary piping and valves. The implementation of a dual circuit and redundancy design can be seamlessly applied to our box coolers, offering versatility and adaptability to specific operational demands.



One Circuit
Single Heat Source



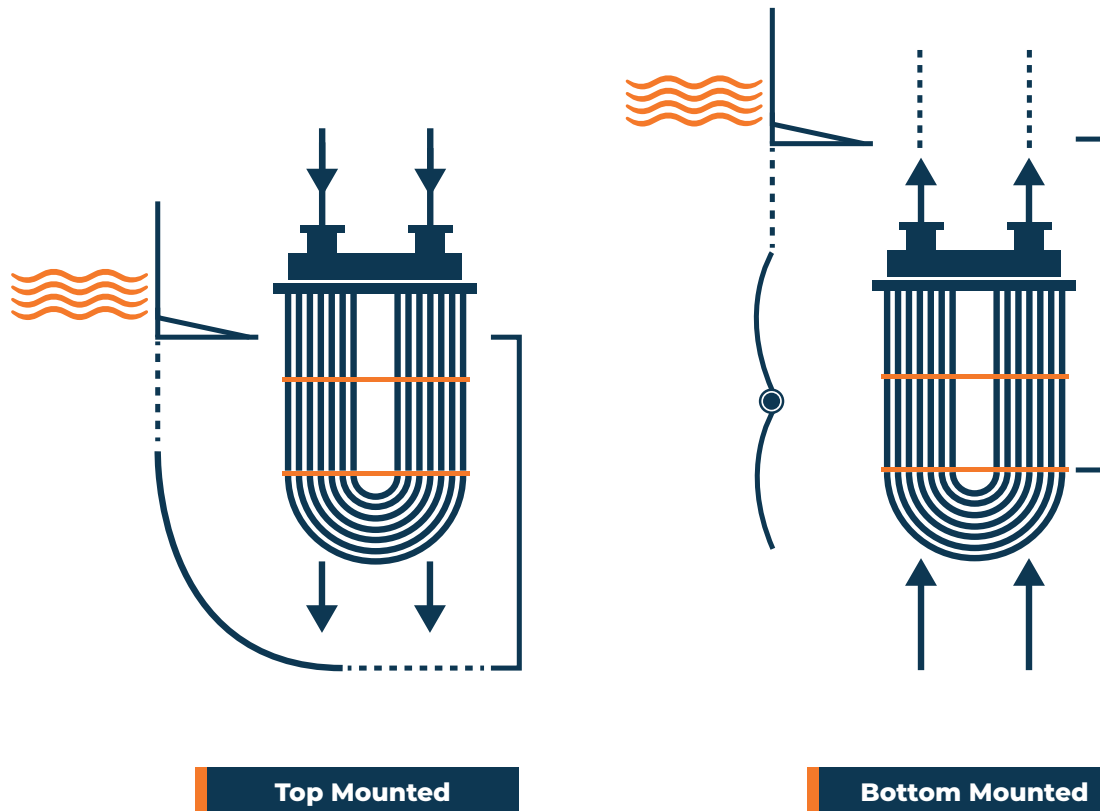
Multiple Circuits
More Than 1 Heat Source

Design Specifications

The fundamental design parameters for the box cooler encompass:

- **Design Pressure: 3.0 bar g**
- **Test Pressure: 4.5 bar g**
- **Design Temperature: 100 °C**

It's important to note that these figures may occasionally be adjusted to align with the precise specifications of particular classification societies and individual customer needs. Every box cooler undergoes a rigorous hydraulic pressure test at our manufacturing facility. Upon completion, it is furnished with a pressure test certificate and, when applicable, a classification society certificate. These certificates serve as a testament to the quality and compliance of our box cooler products.



Installation Methods

The installation of the box cooler provides two distinct approaches, known as "top mounted" and "bottom mounted," each catering to specific vessel configurations and spatial constraints.

Top Mounted:

In the top mounted installation, the box cooler is affixed from above, descending through the top deck into the sea chest. This method is employed when adequate space is available in the machine room directly above the cooler.

Bottom mounted:

On the other hand, the bottom mounted technique comes into play when the space within the machine room above the cooler is limited or insufficient. In such cases, the box cooler is secured from beneath the hull through designated hatches in the sea chest. The specific installation version determines the configuration of the mounting frame for the box coolers.

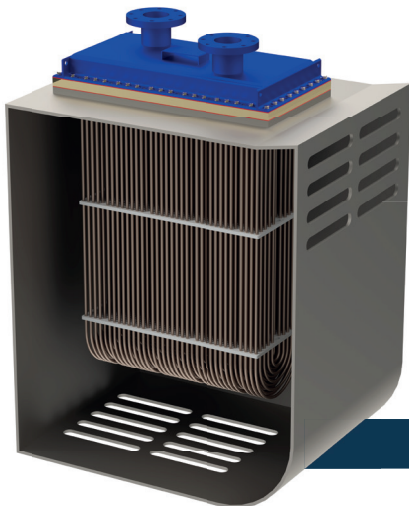
Optimal Placement within the sea chest

Precise positioning within the sea chest is paramount for ensuring the peak thermal performance of box coolers. This critical step demands careful consideration and planning. Typically, two primary options exist for the positioning of box coolers: longitudinal and transversal placement.

Longitudinal Positioning:

In the top mounted installation, the box cooler is affixed from above, descending through the top deck into the sea chest. This method is employed when adequate space is available in the engine room directly above the cooler.

Longitudinal Installation



Transversal Installation

Transversal Positioning:

Alternatively, box coolers can be positioned transversely, perpendicular to the vessel's longitudinal axis. Engineered precisely to ensure optimal results.

Furthermore, it's common practice to install multiple box coolers within a single sea chest on a vessel. However, such configurations require meticulous design and planning to maximize effectiveness. Weka possesses the expertise and professional knowledge to collaborate with designers in formulating the optimal solutions for these complex placement scenarios. Our commitment to precision ensures that the chosen positioning enhances the overall performance of box coolers in the maritime environment.

THIS IS OUR MASCOT
MILO

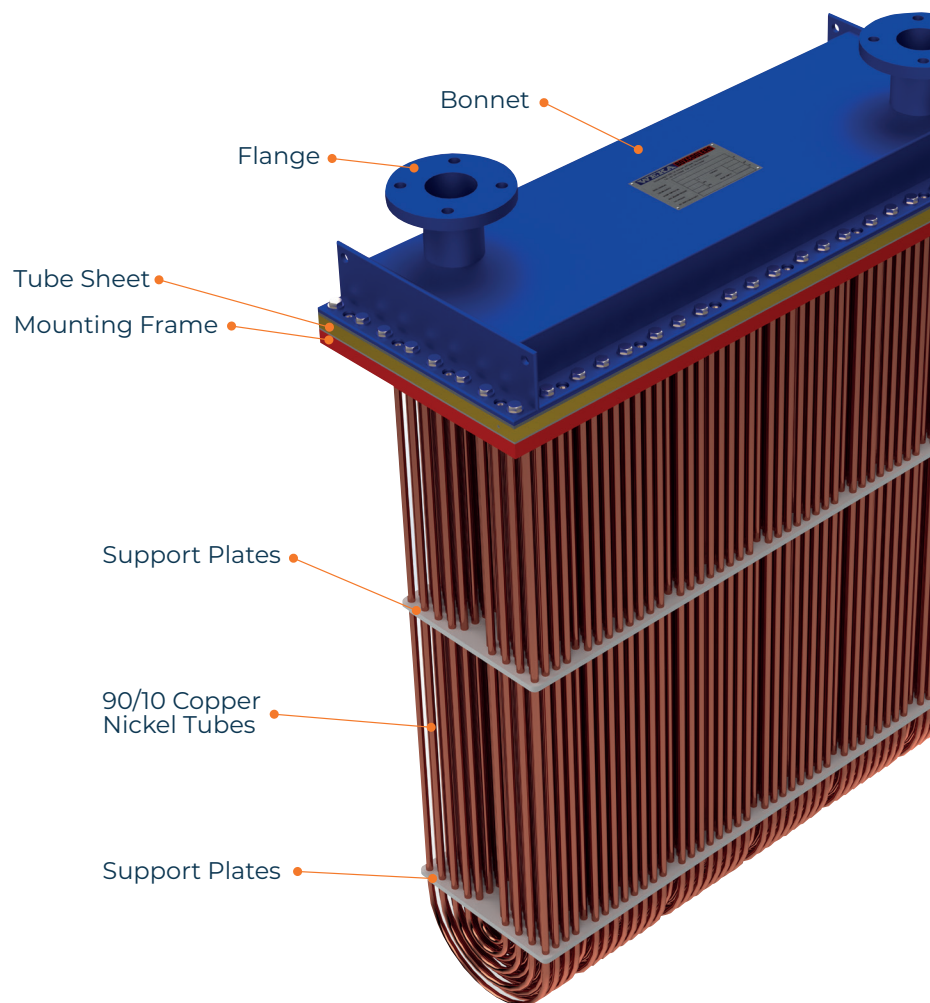
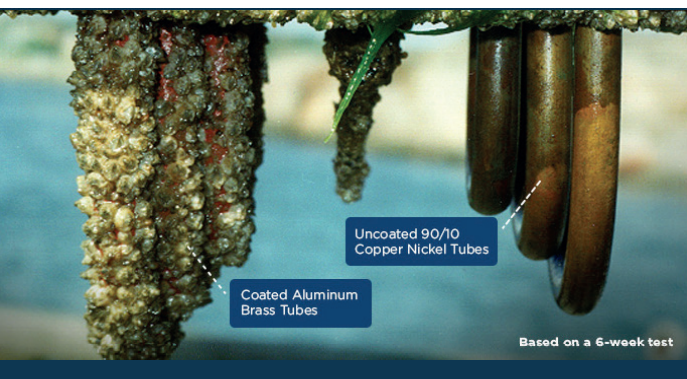


90/10 Copper-Nickel

WEKA's signature Box Cooler is constructed using uncoated 90/10 copper-nickel tubing. This alloy does not require a protective coating or ICAF (impressed Current Anti-Fouling) system due to its inherent corrosion resistance to seawater and natural anti-fouling capabilities. To protect the uncoated boxcoolers against potential stray current corrosion, a WEKA Guard™ and WEKA Protector™ system are applied. This exclusive design is successfully utilized in hundreds of vessels in fresh and saltwater applications worldwide.

Isolation

Our boxcoolers are constructed to be completely isolated from the hull during installation and in operation. Isolation from the ship's hull combined with the WEKA Protector™ allows the copper-nickel to maintain its anti-fouling capability.



70/30 Copper-Nickel

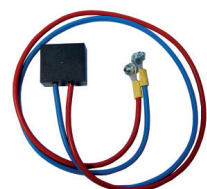
Another copper-nickel cooling solution is the uncoated 70/30 copper-nickel Box Cooler. The 30% nickel alloy is stronger and can withstand higher seawater velocities, compared to the 90-10 alloy and does also not require a protective coating or ICAF (impressed Current Anti-Fouling) system due to its inherent corrosion resistance to seawater and natural anti-fouling capabilities. To protect the uncoated boxcoolers against potential stray current corrosion, a WEKA Guard™ and WEKA Protector™ Type T system are applied. This exclusive design is successfully utilized in specific cooling projects worldwide.

WEKA Protector™ and WEKA Guard™

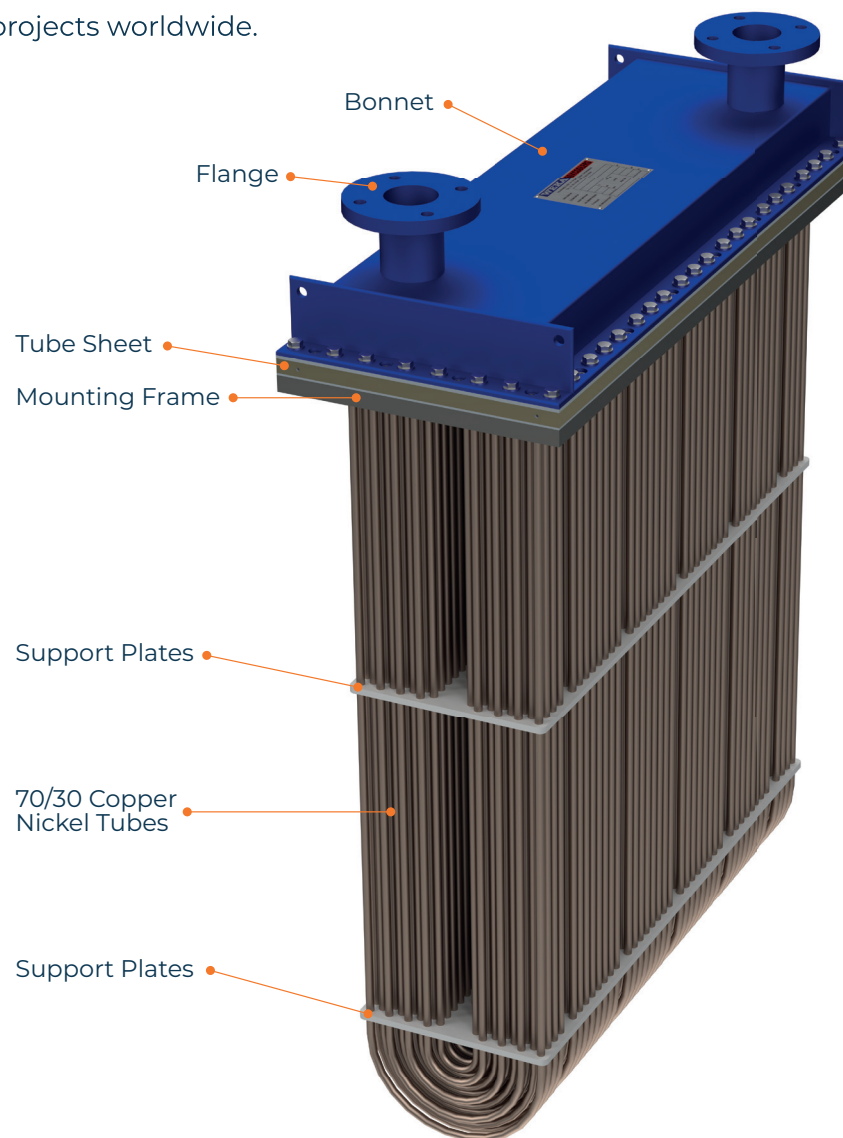
Exclusive to WEKA Boxcoolers are the WEKA Protector™ and WEKA Guard™. This equipment helps to minimize potential damage to the units and hull from stray electrical currents and galvanic corrosion. The WEKA Protector™ also allows the copper-nickel to maintain its anti-fouling capabilities, protecting the tubes from marine growth.



WEKA Protector™



WEKA Guard™



Coated Aluminum/Brass

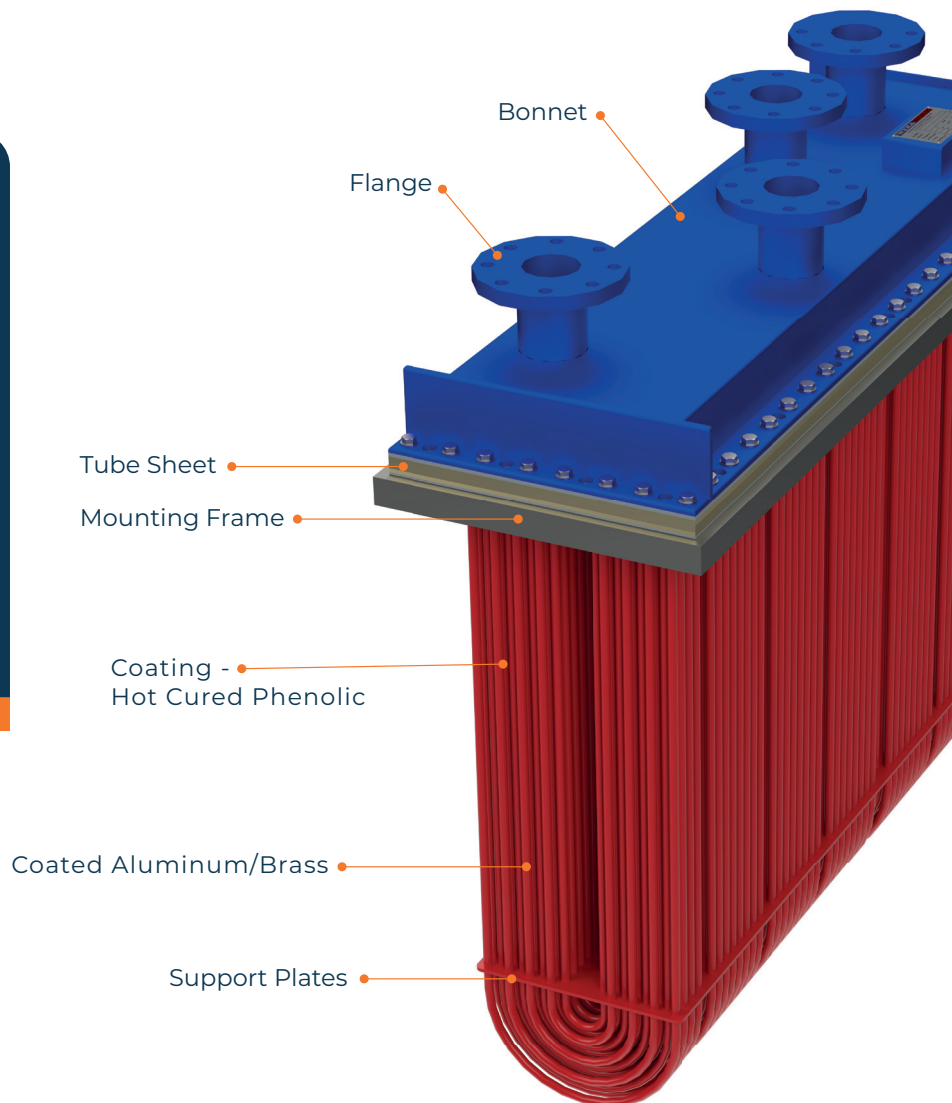
The aluminum brass box coolers are used throughout the marine market and is mainly used for its strength. Nonetheless this alloy needs a protective phenol heat-cured coating and protection system due to its inherent corrosion resistance to seawater and lack of natural anti-fouling capabilities. Due to the coating the box cooler is protected against galvanic corrosion and combines this with high heat-conductivity properties. A coated alu/bra box cooler needs anti-fouling system for protecting it against marine growth.

Ultrasonic System

When biological fouling is an issue, the ultrasonic system can protect the box coolers against marine growth. Bio-fouling reduces its cooling efficiency, especially for low-temperature circuits on a non-moving vessel, or regions with rich marine creatures.



Ultra Sonic System



BUNDLED TO
PERFECTION!



Maximize your cooling capacity & support marine life

Our Weka Marine Environment (WME) program, enables you to move towards a resilient ocean (sustaining marine life and functioning ecosystems) and an efficient cooling system on board. How? Through our circular economy process and innovative cooling products that deliver sustainable productivity and meet your challenges, such as rising operation costs, tighter regulations and increased societal expectations. WME Program is feasible today, requiring a small shift in how we collaborate and innovate. WME Program is an invitation to join us in co-creating and adopting the solutions that will transform maritime industry into more sustainable industries and taking care of our oceans in the process.



CLASSIFICATIONS

Abbr.	Classification society	Country
ABS	American Bureau of Shipping	United States of America
BV	Bureau Veritas	France
CCS	China Classification Society	China
CSR	China Corporation Register	Taiwan
DNV	Det Norske Veritas	Norway
IRS	Indian Register of Shipping	India
KR	Korean Register of Shipping	South-Korea
LRS	Lloyds Register of Shipping	United Kingdom
MROS	Maritime Register of Shipping	Russia
NK	Nippon Kaiji Kyokai	Japan
NSI	Nederlandse Scheepvaart Inspectie	The Netherlands
RINA	Registro Italiano Navale	Italy
RMRS	Russian Maritime Register of Shipping	Russia
USCG	United States Coast Guard	United States of America

Stay Cool, Sail Cool with our services

START-UP SERVICES: Ensuring Product Reliability

At our core, we are committed to the safe delivery of our products, coupled with thorough validation processes to guarantee robust and reliable performance throughout their extensive life cycle.

- Commissioning and Installation

SPARE PARTS AND SOLUTIONS: Preserving Equipment Excellence

The finest equipment, even when built to perfection, may exhibit signs of wear as time progresses. To address this, we are committed to exclusively utilizing the highest quality spare parts. These components are meticulously designed to replicate the excellence of the originals, ensuring that the optimal synergy between all elements is upheld. This unwavering commitment to preserving the original design offers the utmost security for your investment.

- Comprehensive Spare Part Kits.
- Delivery of All Related Box Cooler Parts.
- Ultra-Sonic System Spares.

REPAIRS AND OVERHAULS: Minimizing Downtime, Maximizing Performance

We recognize the severe consequences of unscheduled downtime, which can be nothing short of disastrous. To address this, our team of highly trained engineers stands ready to respond promptly to any emergency situation. Our objective is to review and repair components while ensuring minimal disruption to your operations. All overhaul work is conducted within our production facility, adhering to the most stringent quality standards.

- Complete Overhaul, Repair, or New Production.
- Professional Repair in Workshop.
- Replacement or Re-Tubing of Tube Stacks.
- Renewal of External Coating/Re-Coating for our coated coolers.
- Service Agreements / Frame Contracts.
- Assistance with Assembly and Disassembly, Shipping, and Transport.

TESTING AND MONITORING: Enhancing Reliability and Efficiency

Gaining insights into the condition of your equipment is pivotal to ensuring dependable production, elevating safety and energy efficiency, and extending equipment lifetime. This proactive approach also empowers you to avert breakdowns and prepare for the future.

- Leakage and Pressure Test.
- Endoscopical Analysis.
- Analysis of Cooling Water.
- Survey of Complete Cooling System.

INSPECTIONS AND MAINTENANCE: Enhancing Performance and Longevity

Through routine inspections and meticulous maintenance, we collaborate with you to achieve several pivotal objectives: cost reduction, the extension of the lifetime of your Weka products, the attainment of consistent and reliable performance, and streamlined budget planning.

- Cleaning of Inner and Outer Surfaces.
- Extensive Damage Assessment and Resolution.
- Flow Measurement on Site.
- Endoscopical Analysis.
- Supervision of Sea Chest Maintenance.

UPGRADES AND REPLACEMENTS: Ensuring Continuous Efficiency

We prioritize the replacement of components as a proactive measure to maintain the smooth operation of our heat exchangers and prevent any unwarranted downtime. In instances where components have become obsolete, we readily propose upgrades to ensure ongoing performance.

- Analysis and Assessment of Performance Bottlenecks.
- High Availability of Parts for Older Units.
- Fast and Efficient Service Processing.

CONSULTING AND TRAINING: Tailored Solutions and Expert Guidance

If you seek a consultancy service that prioritizes the unique aspects of your process, Weka is your ideal partner. We are dedicated to working closely with you to craft precise solutions that align with your specific needs.

- Solution-Oriented Consultation.
- Collaborative Partnership.
- Expert Guidance.
- Long-Term Perspective.



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