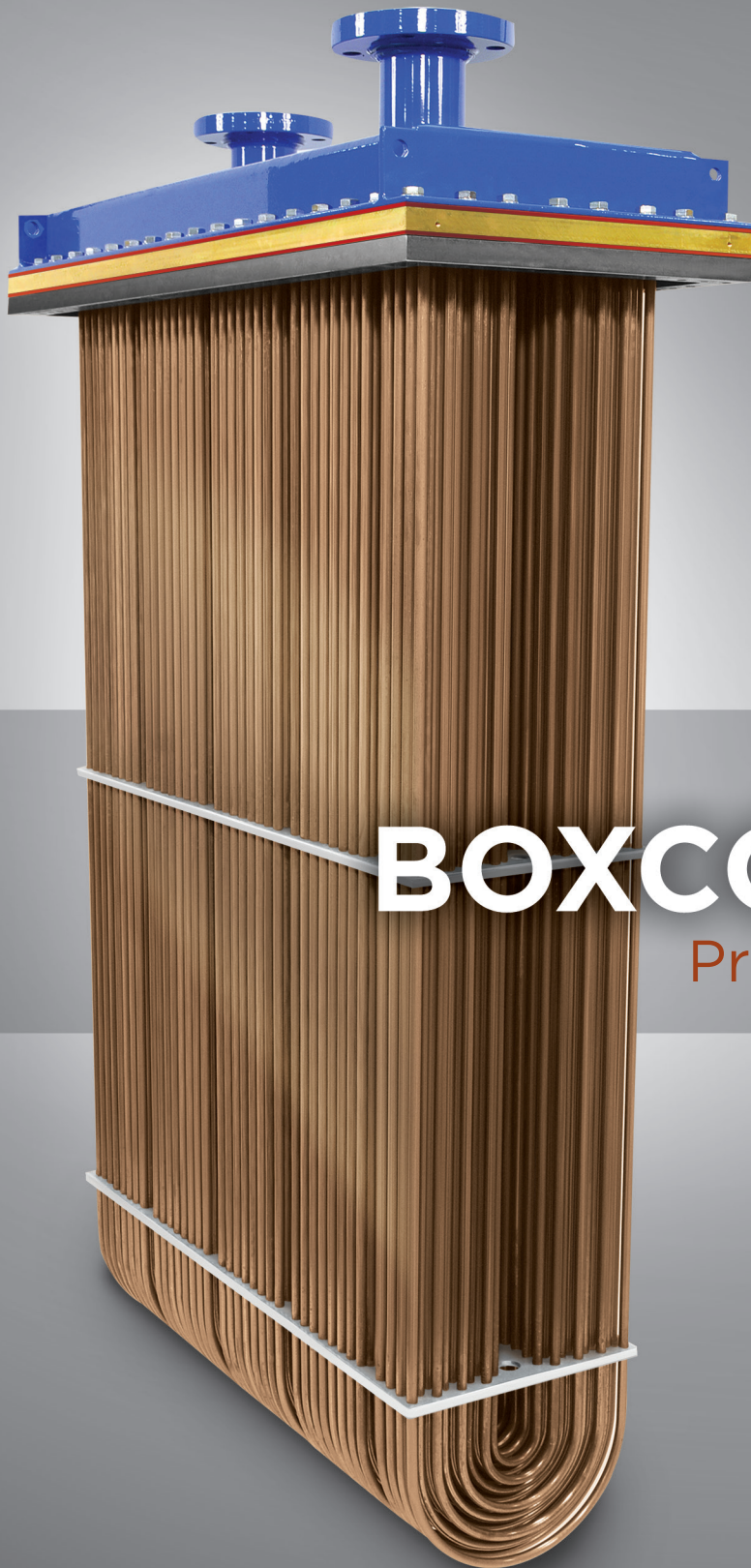




WEKA

BOXCOOLER

Product Catalog



WEKA Marine B.V.

The **WEKA Boxcooler** is a compact, closed circuit cooling system that is mounted in a sea chest within the confines of the vessel's hull, offering excellent protection from submerged obstacles. The boxcooler also eliminates the need for raw water pumps, strainers, and filters. Each WEKA Boxcooler is custom engineered to meet the specific requirements of the engine, vessel, and operating conditions. With over 50 years of experience in marine cooling, our team can provide expert advice on cooler sizing, placement, installation, and service.

Boxcooler Advantages

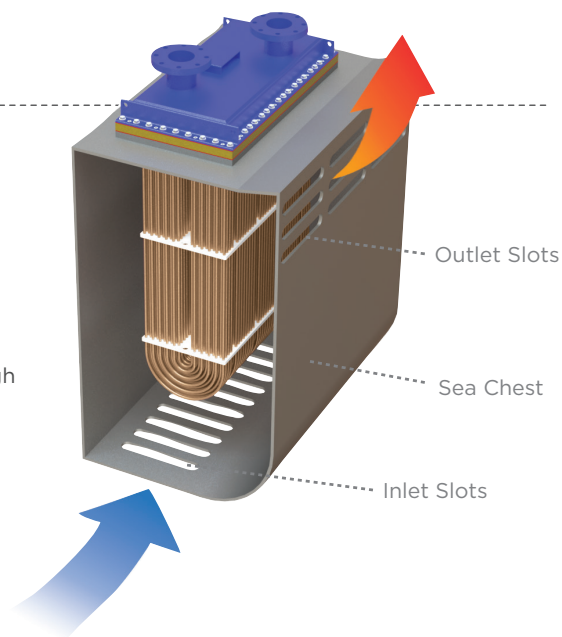
- Eliminates raw water pumps, strainers, and filters
- Virtually maintenance free
- Cools engines up to 10,000 kw
- In-hull protection

Boxcooler Technology

A boxcooler exploits natural convection. The heat source cooling water is circulated through the boxcooler tube bundle which is suspended in the sea chest. Heat is transferred from the boxcooler tubes to the seawater, causing it to rise due to its lower density creating a natural upward circulation. Openings in the bottom and upper side of the sea chest help to direct and focus the natural convection flow of seawater through the sea chest and across the boxcooler tubes. Additional cooling efficiency can be realized through forced circulation induced by the motion of the vessel (please see Figure 1 for an illustration).

FIGURE 1: Boxcooler (shown at right)

The position of the inlet and outlet slots direct the natural flow of seawater through the sea chest and across the boxcooler tubes.



Engineered to Cool

The WEKA Boxcooler is a custom engineered cooling solution designed to meet the specific demands of the engine manufacturer and operating conditions of your vessel. This design is ideally suited for vessels operating in icy, sandy, or debris laden water.

Applications

- Air Conditioning Units
- Bow Thrusters
- Compressors
- Electrical Equipment
- Generator Sets
- Hydraulics
- Propulsion & Auxiliary Engines
- Pumps
- Reduction Gears

Type of Vessel

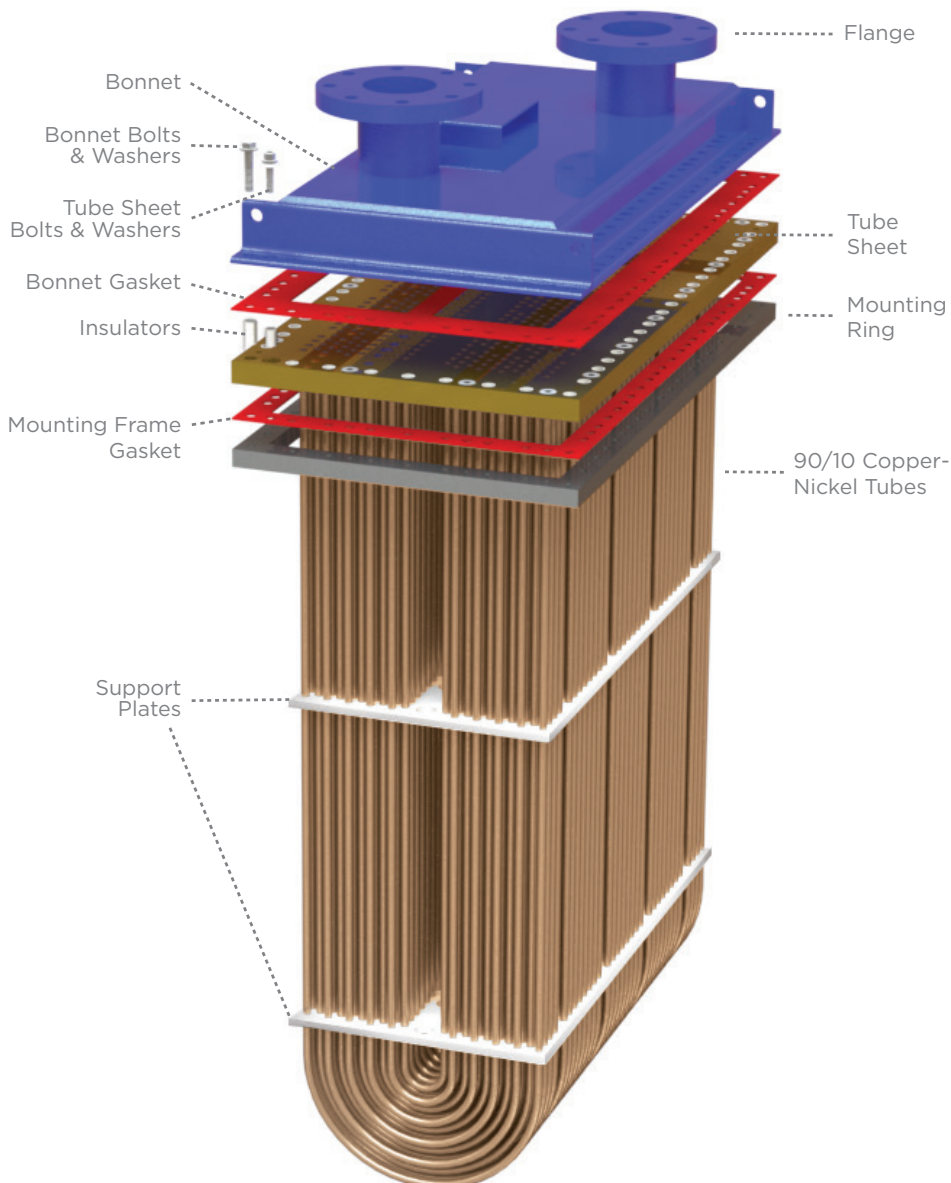
- Barges
- Cargo Ships
- Carriers
- Dredgers
- Ferries
- Fishing Vessels
- Ice Breakers
- Supply Vessels
- Tankers
- Tugs

Design Features

90/10 Copper-Nickel

WEKA Boxcoolers are 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™ Type T system is applied. This exclusive design is successfully utilized in hundreds of vessels in fresh and saltwater applications worldwide.

Exploded View of the WEKA Boxcooler



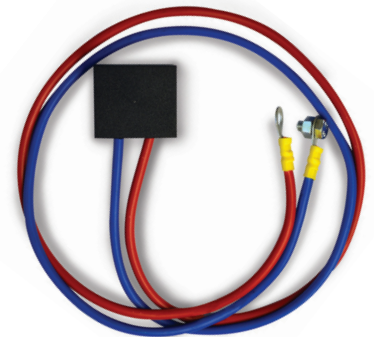
WEKA Protector™ Type T and WEKA Guard™

Exclusive to WEKA Boxcoolers are the WEKA Protector™ Type T 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™ Type T also allows the copper-nickel to maintain its anti-fouling capabilities, protecting the tubes from marine growth.

WEKA Protector™ Type T



WEKA Guard™



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™ Type T allows the copper-nickel to maintain its anti-fouling capability.



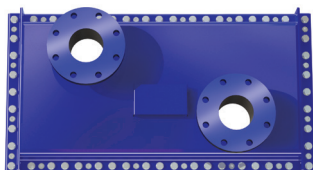
Based on a 6 week test

Protection against biological marine growth is necessary. This image illustrates a comparison between traditional aluminum brass tubes with hard baked coating (left side) and uncoated 90/10 copper-nickel tubes (right side). The high copper content of the tubing provides natural anti-fouling capabilities, offering protection against marine growth.

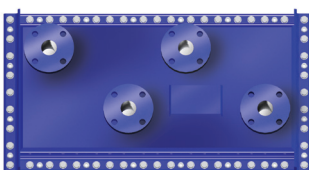
Single or Multiple Heat Sources

A boxcooler can be designed to support single or multiple heat sources on one unit.

One Circuit Single Heat Source

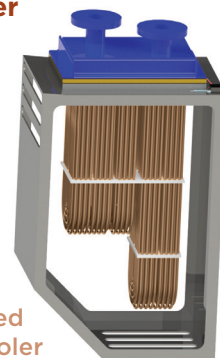


Multiple Circuits More Than 1 Heat Source



Stepped Boxcooler

A WEKA Boxcooler can be engineered to accommodate tight spaces by stepping the unit.



Stepped
Boxcooler

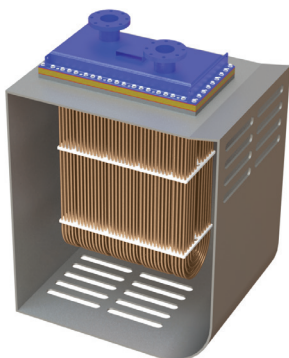
Bottom Mounted Boxcooler

WEKA Boxcoolers have been successfully applied in bottom mount applications, such as repower projects or when additional equipment requires cooling. In most cases, a boxcooler is installed in a top down fashion by lowering the unit into the mounting frame and welding the unit to the top of the sea chest. In a bottom mount application, a special top sea chest plate is pre-manufactured and secured to the unit's mounting frame. The entire assembly is lifted from the bottom of the vessel through a hole cut in the hull and sea chest. The boxcooler is then fitted into the top of the sea chest and welded into place.

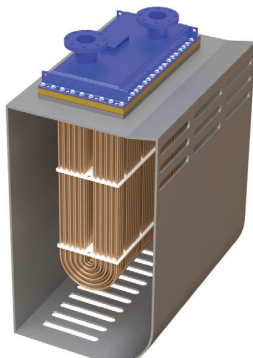
Installation

A boxcooler is installed one of two ways, athwartship or longitudinal.

Athwartship Installation



Longitudinal Installation



Sea Chest

The sea chest requires careful planning. The inlet and outlet slots of the sea chest must provide a constant flow of seawater over the boxcooler's tubes. The inlet slots are located at the base of the sea chest and should be positioned transversely to the outlet slots on the side of the sea chest. The outlet slots should be positioned as close to the top of the sea chest as possible. The outlet slots must always remain below the waterline, even when the vessel is in a light draft condition. Please refer to the installation manual for guidelines on slot quantity and sizing.

Recommendation Information

Our team will need the following specifications to make a proper product recommendation.

Engine Information

- Engine Type (Propulsion, Bow Thruster, Generator, Other)
- Emissions Data (Tier 1, 2, 3, or IMO)
- Engine Manufacturer
- Model
- Rating (BHP / RPM, BkW / RPM, EKW / RPM)
- Engine Age
- Percentage of Antifreeze Used
- Heat Rejection
- Fresh Water Flow Rate
- Fresh Water Temp Into Cooler
- Fresh Water Temp Out or Drop Across Cooler

Reduction Gear Information

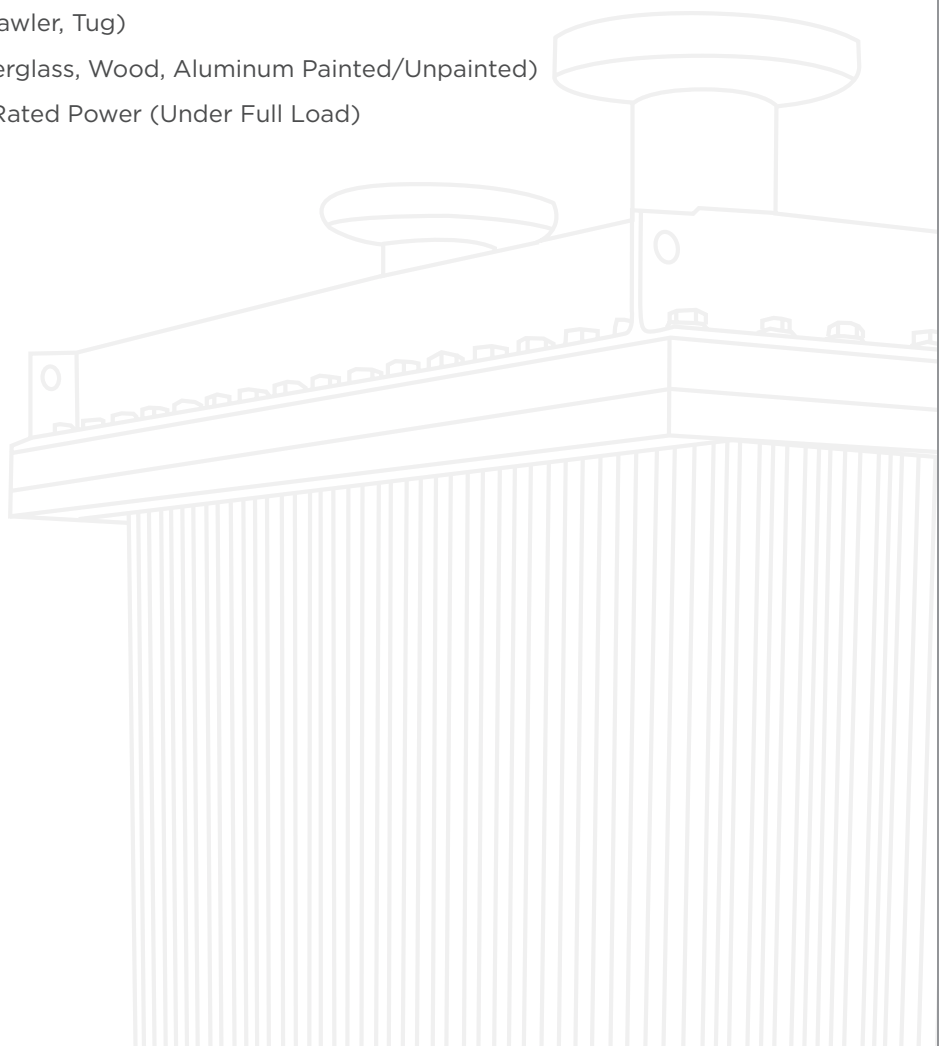
- Make & Model of Gear

Vessel Information

- Type of Vessel (e.g., Ferry, Trawler, Tug)
- Hull Construction (Steel, Fiberglass, Wood, Aluminum Painted/Unpainted)
- Minimum Hull Speed at Full Rated Power (Under Full Load)

Environmental Conditions

- Maximum Seawater Temp





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