Kai Marine

ARKA seni 2026

CUSTOM SHELL & TUBE HEAT EXCHANGER SOLUTIONS

Marine • Offshore • Oil & Gas • Industrial

Engineered to Your Requirements.
Built for Demanding Service.

- Replacement
- Retrofit
- New Build
- Custom Engineering



Anchoring Trust.
Navigating the Future.

CUSTOM ENGINEERED SOLUTIONS



Not Every Heat Exchanger Comes From a Catalogue.

Every vessel, offshore facility, plant and operating system has different requirements.

Kai Marine provides Custom Shell & Tube Heat Exchanger Solutions developed around actual operating conditions, dimensional constraints, material requirements and applicable technical standards.

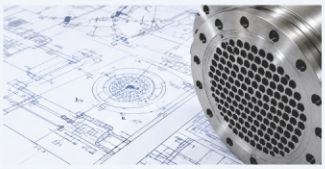
Whether replacing an obsolete exchanger, upgrading an existing system or developing equipment for a new project, our approach begins with understanding the actual duty and application.

OUR SOLUTIONS



Replacement & Retrofit

Custom replacement of existing or obsolete heat exchangers based on available drawings, dimensions, nameplate information and operating data.



New Build

Purpose-built heat exchangers engineered according to project specifications and required operating conditions.



Marine & Offshore Cooling

Heat exchanger solutions for seawater, freshwater, lubricating oil, HVAC, refrigeration and process cooling applications.



Process & Industrial Service

Custom heat exchanger solutions for demanding process and pressure-containing applications.

APPLICATIONS



Main & Auxiliary Engine Cooling | Jacket Water Cooling | Lubricating Oil Cooling

Central Cooling Systems | Seawater Cooling | HVAC Condensers

Refrigeration Evaporators | Cargo & Process Cooling

Specialised Process Heat Exchangers

FROM REQUIREMENT TO SOLUTION

Existing Equipment / Technical Data ▸ Technical Review ▸ Thermal & Mechanical Design ▸ Material Selection ▸ Drawing Approvel ▸ Manufacturing ▸ Inspection ▸ Documentation ▸ Delivery

ENGINEERING & MATERIALS

ENGINEERED FOR THE DUTY



A reliable heat exchanger starts long before fabrication.

Our manufacturing engineering capability supports recognised thermal and mechanical design tools and calculations for custom heat exchanger development.

ENGINEERING CAPABILITY

Aspen EDR
Heat exchanger thermal design and rating.

HTRI
Thermal performance analysis.

PV Elite
Pressure vessel mechanical analysis

Tube Sheet Calculation
Evaluation of tubesheet design requirements.

Fatigue Analysis
Assessment according to applicable design and operating requirements.

Nozzle Load Analysis
Evaluation of external loading at exchanger connections.

Flow-Induced Vibration Analysis
Evaluation of tube vibration associated with fluid flow.

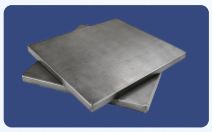


DESIGN STANDARDS AND CODES

ASME Section VIII Division 1 | TEMA | API, where applicable
EN 13445 | Marine Classification Rules

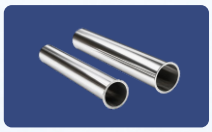
MATERIAL FLEXIBILITY

Material selection can be developed according to operating temperature, pressure, fluid characteristics, corrosion environment and project specifications.



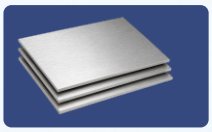
Carbon Steel

For general pressure-containing and industrial applications.



Stainless Steel

For applications requiring enhanced corrosion resistance.



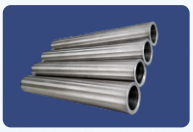
Duplex Stainless Steel

For demanding corrosive and chloride-containing environments.



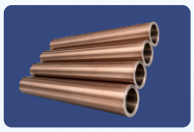
Titanium

Excellent corrosion resistance for demanding seawater applications.



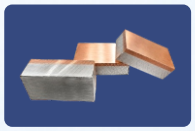
CuNi 90/10

Suitable for a wide range of marine seawater cooling applications.



CuNi 70/30

Available for applications requiring CuNi material selection.



Clad Plates

For specialised pressure and corrosion requirements.

CUSTOM MEANS CUSTOM.

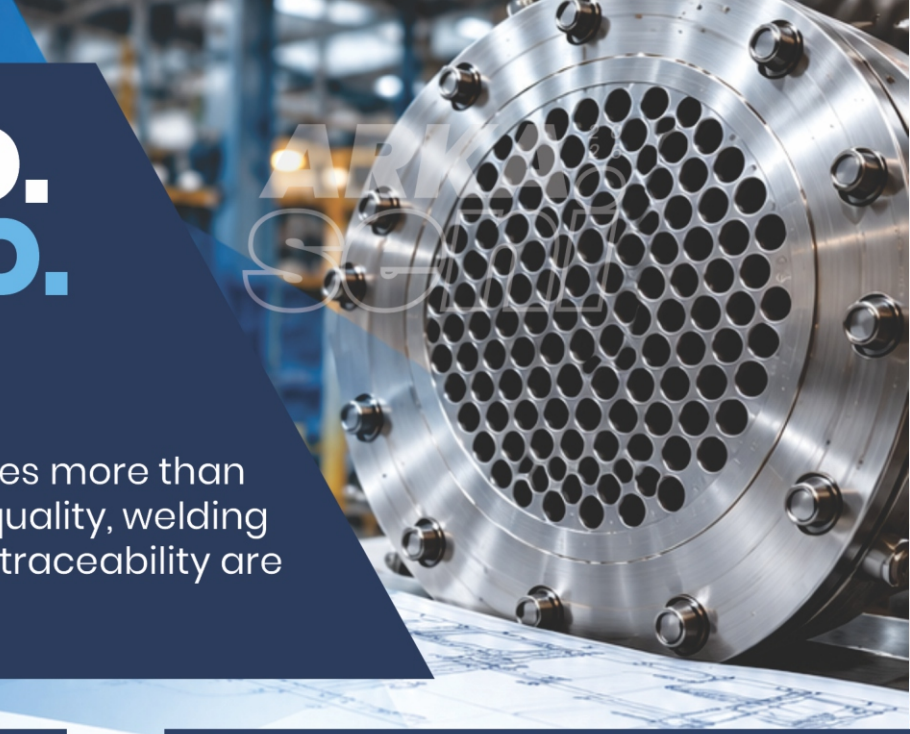


- Material
- Dimensions
- Configuration
- Operating Conditions
- Design Requirements

Engineered around the application rather than forcing the application to fit a standard catalogue unit.

ENGINEERED. FABRICATED. INSPECTED.

A custom heat exchanger requires more than thermal design. Manufacturing quality, welding control, inspection and material traceability are integral parts of the equipment.



FABRICATION CAPABILITY

- Shell Rolling
- Tube Sheet Machining
- Tube Expansion
- GTAW
- SMAW
- SAW
- FCAW
- PWHT
- Pickling & Passivation

WELDING CONTROL

- Welding Procedure Specification — WPS
- Procedure Qualification Record — PQR
- Welder Qualifications
- Welding Maps
- Heat Treatment Records

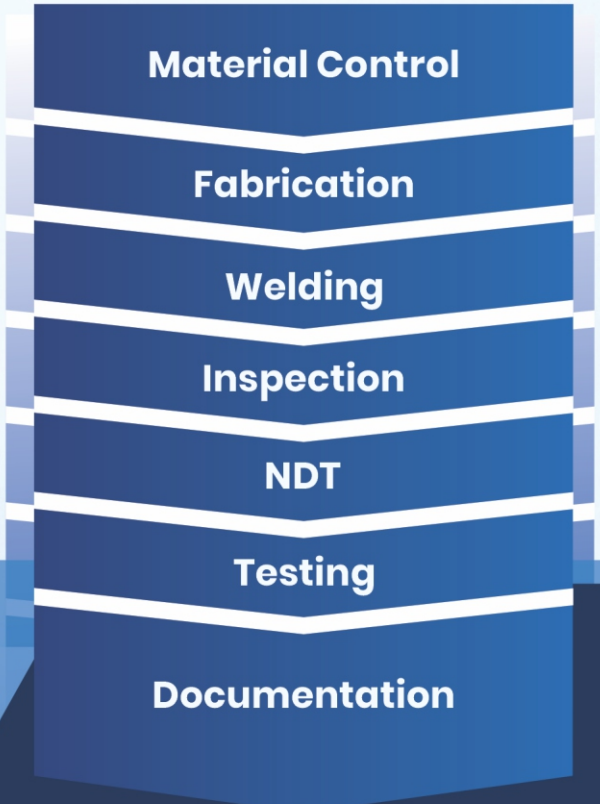
PRESSURE & INTEGRITY TESTING

- Hydrostatic Test
- Pneumatic Test
- Leak Test

INSPECTION & NDT

- VT — Visual Testing
- PT — Liquid Penetrant Testing
- MT — Magnetic Particle Testing
- UT — Ultrasonic Testing
- RT — Radiographic Testing
- PMI — Positive Material Identification
- Hardness Testing
- Ferrite Testing
- Borescope Inspection

QUALITY THROUGHOUT THE PROCESS





DOCUMENTATION

BUILT WITH DOCUMENTATION IN MIND

For marine, offshore and Oil & Gas projects, the equipment is only part of the deliverable.

Kai Marine can structure project documentation around agreed client, classification, inspection and project requirements.

QA/QC DOCUMENTATION

- Inspection & Test Plan — ITP
- Quality Control Plan — QCP
- Hydrotest Procedure
- Tube Expansion Procedure
- Packaging & Preservation Procedure



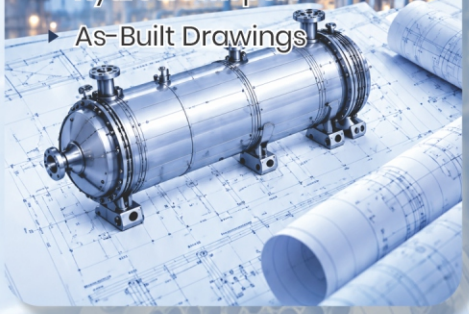
MATERIAL TRACEABILITY

- EN 10204 3.1
- EN 10204 3.2
- Mill Material Certificates
- Chemical & Mechanical Property Reports
- PMI Reports



MANUFACTURING DATA BOOK

- Thermal Calculation
- General Arrangement — GA Drawings
- Fabrication Drawings
- Bill of Materials — BOM
- Material Certificates
- NDT Reports
- Hydrotest Report
- As-Built Drawings



CERTIFICATION CAPABILITY

ASME SETTING THE STANDARD — U Stamp

National Board Registration

DOSH

ISO 9001

ABS

DNV

CCS CHINA CLASSIFICATION SOCIETY

Certification and classification requirements are subject to individual project scope and confirmation.



WHY KAI MARINE?

YOUR TECHNICAL LINK TO MANUFACTURING

Kai Marine combines marine technical understanding, engineering coordination and specialised manufacturing capability to deliver custom heat exchanger solutions from initial enquiry through final delivery.



THE KAI MARINE APPROACH

01 UNDERSTAND
Review the application, operating conditions and project requirements.

02 ENGINEER
Develop the thermal, mechanical, material and dimensional requirements.

03 MANUFACTURE
Controlled fabrication, welding, machining and assembly.

04 INSPECT & TEST
Inspection, NDT and applicable pressure/ leak testing.

05 DOCUMENT
Compile agreed QA/QC and manufacturing documentation.

06 DELIVER
Preservation, packing and logistics coordination.

WHY KAI MARINE

CUSTOM ENGINEERING
Solutions developed around actual project requirements.

MATERIAL FLEXIBILITY
- Carbon Steel
- Stainless Steel
- Duplex
- Titanium
- CuNi

ENGINEERING SUPPORT
- Thermal
- Mechanical
- Tubesheet
- Fatigue
- Nozzle Load
- Vibration Analysis

QUALITY & TRACEABILITY
- Controlled Manufacturing
- NDT
- Testing
- QA/QC Documentation

MARINE-FOCUSED SUPPORT
Technical coordination from enquiry through delivery.

TELL US THE DUTY
WE ENGINEER THE SOLUTION.

For enquiries, provide:

- **Operating Medium** • **Flow Rate** • **Inlet/Outlet Temperature**
- **Operating & Design Pressure** • **Existing Drawing / Datasheet**
- **Material Requirement** • **Design Standard / Classification Requirement**

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Anchoring Trust.
Navigating the Future.

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