

DATA CENTER SOLUTIONS



Our Data Center Capabilities

We know that efficiency and reliability are paramount when it comes to productivity and sustainability of data centers. We offer a variety of high-performance options for cooling all aspects of mission-critical infrastructure and for utilization of waste-heat-recovery strategies. Given our engineering expertise and manufacturing capability, we will continue to develop high-performance aluminum cooling solutions to meet future demands.

Our areas of expertise.

Air Cooled.



Typical Applications

- Cooling tower open-loop cooling isolation
- Cooling and isolation with open-loop water (well, lake, river, brackish, salt, gray)
- Free cooling with air or water
- Chiller bypass
- Air-cooled chiller (ACC) coils
- CRAH chilled water cooling coils
- Fan wall coils
- Chiller shell-and-tube heat exchangers
- Refrigerant cooling and condensation
- Backup power genset on-engine and remote cooling
- In-row and rear-door chilled water-cooling coils
- CRAC condenser and evaporator coils and heat exchangers

Direct-to-Chip.



Typical Applications

- Cooling and isolation with open-loop water (well, lake, river, brackish, salt, gray)
- CDU cooling heat exchangers
- Cooling coils for adjacent air-cooling modules
- Air-cooled chiller (ACC) coils
- Dry coolers, V-Bank systems, and custom cooling solutions
- Water-cooled chiller shell-and-tube heat exchangers
- Waste heat recovery solutions

Edge.



Typical Applications:

- Cooling and isolation with open-loop water (well, lake, river, brackish, salt, gray)
- Single- and dual-loop cooling coils
- Fan wall coils
- Refrigerant cooling and condensation
- Primary or backup power on-engine or remote cooling
- Waste heat utilization or recovery

Immersion.



Typical Applications:

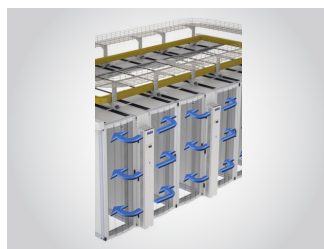
- Cooling and isolation with open-loop water (well, lake, river, brackish, salt, gray)
- Waste heat recovery
- Tank cooling integration
- Two-phase fluid cooling and condensation
- Dry coolers, V-Bank systems, and custom cooling solutions
- Single-loop – dielectric fluid coils and modules
- Dual-loop – water-water/glycol coils and modules

Data Center Application Strategy—Brazen Aluminum T-BAR™

Disrupt and displace copper tube / aluminum fin chilled water-cooling coils as basis of design in major applications



RDHX



**CRAHs/
IN-ROW COOLING**



**FAN WALL/
CLOSE-COUPLED COOLERS**



AIR-COOLED CHILLERS

Bar & Plate Aluminum Cooler Capabilities

Product Technology

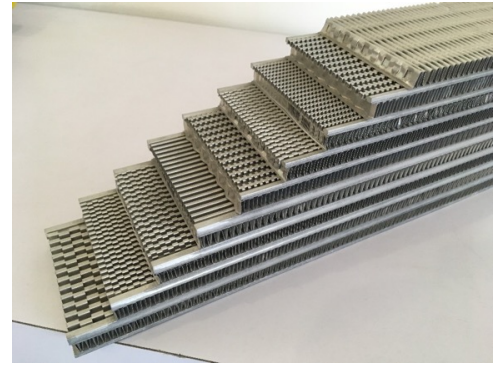
Vacuum-brazed aluminum

Product Highlights

- Standard components offer flexibility
- Braze multiple fluid circuits in one unit
- Compact efficient surfaces
- High- and low-pressure designs
- Low-to-no tooling required
- Wide range of fins available
- Maximum single core 50" x 80" x 12"
- Multiple cores can be welded together

Manufacturing Locations

- API Suzhou, China
- Racine, WI (final assembly)



T-BAR™ Aluminum Cooler Capabilities

Product Technology

Controlled atmospheric braze
CAB extruded tubes & bar – T-BAR™
All-aluminum construction

Typical Applications

- Data center – water*/water-glycol
- Immersion cooling – dielectric fluid
- Custom cooling coil designs

Product Highlights

- Optimized for the highest performance
- Air-to-liquid cooling capability
- Standard components offer flexibility while accommodating customer customizations
- Multiple fin profiles & fin densities
- Zinc – alloyed materials for corrosion protection
- Enhanced extruded tubes with BIC durability
- Eliminates leak paths from bar & plate
- Extruded aluminum tanks
- High pressure greater than 600 PSIG
- Max temperature to 275°C / 527°F
- Max size: continuous core @ 48"W x 82"L
> 120" stack height
Max 82" single-core length

Manufacturing Locations

- API Franklin, WI
- API Racine, WI (tank & asm prep)



Micro-Channel Condenser Capabilities

Product Technology

CAB brazed-aluminum extrude tube

Product Highlights

- 18mm and 25.4mm core depths
- Louvered 14-20 FPI
- Wave fins 8, 10, 12 FPI
- Max size:
 - 90" manifold-to-manifold
 - 33" stack height/
single core – 80 tubes
 - Multiple combined & welded

Manufacturing Location

- API Franklin, WI



45%
Less Refrigerant

Compared to F&T. Significant cost savings.

29%
Smaller

Compared to F&T.

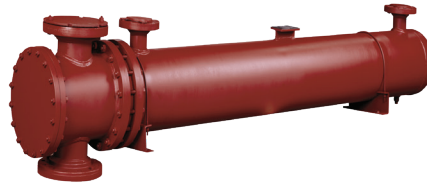
33%
Lighter

Compared to F&T.

Shell & Tube Oil Coolers

Product Highlights

- Catalog / Custom designs
- Efficient (fin bundle)
- Steel, Copper, CuNi, SS, Brass shells
- Cast Iron, Bronze, SS end bonnets
- Steel, CuNi, SS tube sheets
- Steel, CuNi, SS tubes
- Standard product, easy mods



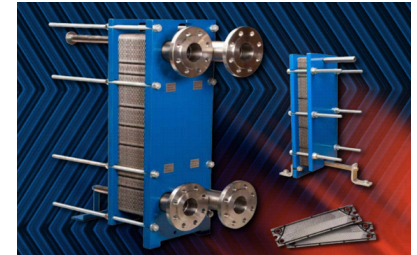
Brazed Plate / Plate & Frame

Product Technology

- SS plates-- copper brazed or gasketed plates

Product Highlights

- Stainless
- Copper brazed or brazed plate
- High performance
- Compact design
- Gas-to-gas, gas-liquid, solvent condensing, refer service



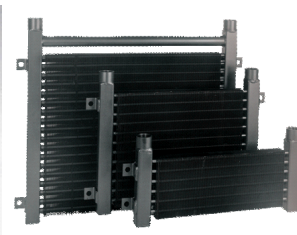
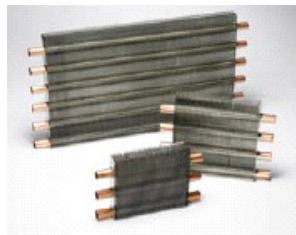
Copper Tube / Aluminum Fin Oil Coolers

Product Technology

- Round copper tube and aluminum fin

Product Highlights

- 3/8" or 3/4" round tubes
- Copper or Steel tanks
- Multi-pass and bypass options
- Numerous standard and custom sizes



Data Center Application Strategy

Disrupt and displace brazed-plate heat exchangers as basis of design in major applications



CDU

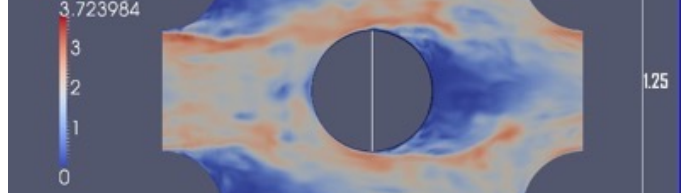
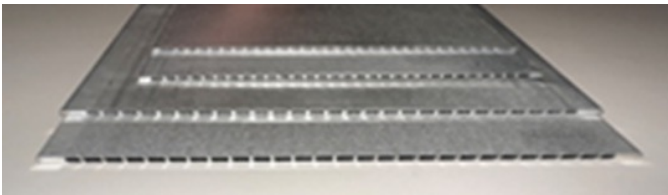


IMMERSION TANKS



AIR-COOLED CHILLERS

T-BAR™ vs. Copper Tube / Aluminum Fin Coils



T-BAR™

- All-aluminum, extrusion & fin CAB core construction
- Not subject to copper price volatility
- Aluminum tanks welded onto brazed core
- Aluminum extrusion flat tube expands fluid contact surface with air creating multiple conduction paths for the fluid to contact the air stream
- Less weight dry & wet
- Use up to 50% less fluid volume in the core
- Higher heat transfer efficiency

Copper Tube / Aluminum Fin Coils

- Copper tube mechanically expanded into aluminum plate fin
- Electrification demands create copper pricing volatility
- Larger-diameter copper pipe manifolds brazed onto the coil core
- Utilize copper for tubes to transport fluid with low-performance spots behind the tube and increased conduction distance for the fluid to contact the air stream
- Coil requires mechanical framing for construction rigidity and support, adding weight
- Can be an advantage in gas distribution for expansion/evaporator applications

T-BAR Solution Advantages – Higher Efficiency

T-BAR delivers the same cooling performance at warmer chilled water temps

- Same copper tube / aluminum fin coil performance at 3-5°F / 1.5-3°C warmer chilled water
- Offloads the chiller, reducing energy consumption and extending free cooling

T-BAR delivers more cooling duty at the same cold chilled water temperature

- Increase dependence on application and performance range, but more cooling duty is delivered in the same coil footprint compared to copper tube / aluminum fin coils

T-BAR can reduce fan power consumption

- T-BAR's higher-efficiency coil requires less fluid flow for the same amount of cooling
- When fluid flows are increased to match the GPM/kW of cooling per the copper tube / aluminum fin coil and cooling duties matched, the fan RPMs can be reduced, saving energy
- Energy savings are fan- and configuration- dependent and range from 20-60%

World Leader in Heat Transfer Technology

API Heat Transfer has successfully established itself as the market leader in innovative and energy efficient equipment. Our 140-year heritage has been dedicated to designing and delivering world-class heat transfer solutions for nearly every industry. Our reputation is bolstered by our worldwide network of manufacturing facilities and more than 1,100 employees who provide sales, service, and support. Our process is ingrained in our culture and has served customers around the world for nearly a century and a half. Working with us, you'll find our performance sets us apart. API Heat Transfer utilizes a customer-focused approach to deliver highly engineered heat transfer solutions for market-specific applications that meet our customers' needs throughout the world.

Quality and capabilities.

API has world-class manufacturing facilities strategically located around the globe with the highest-quality standards and certifications to support the needs of our customers.

World Class

- Global sourcing
- Strategically located
- Product-specific technical centers
- FEA, CFD and other modeling
- Cleaning and regasketing services
- Installation and commissioning engineers

CHINA

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Shanghai

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Certifications

- 3A Sanitary
- ISO 9001:2015
- TUV

USA

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Franklin Facility

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Buffalo Facility

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Codes & Standards

- ASME , PED, GOST, CML
- ANSI, TEMA, CRN, API
- And many more

GERMANY

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