



DESIGN & MANUFACTURE OF HEAT EXCHANGERS FOR HVAC-R, INDUSTRIAL, DOMESTIC, MARINE AND SPECIAL APPLICATIONS.



THERMOGUARD

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ISO 9001
ISO 14001
OHSAS 18001
BUREAU VERITAS
Certification
BUREAU VERITAS
1828
ISO 9001 - ISO 14001 - OHSAS 18001

CHAIRMAN'S MESSAGE



Nooruddin N.J
Chairman, Dolphin Group

It is my great pleasure to introduce Dolphin Manufacturing LLC, a branch of Dolphin Group. Having been in business for over 30 years, Dolphin has enjoyed a strong reputation in the Heat Transfer Industry.

Dolphin's aim is to continue to be at the pinnacle of a profession through innovation and a new way of thinking by keeping with the rapid technical progress during the present period. We believe this has accumulated in the provision of quality products at a fair price as the market dictates and expects.

The employees and management of Dolphin are dedicated to maintaining their position as the leader in the heat transfer industry. Dolphin promises to continue making these contributions at all times.

We extend our deepest gratitude to all friends and business partners of Dolphin and ask for your continued patronage and encouragement.

We trust you will continue to place your confidence in Dolphin.

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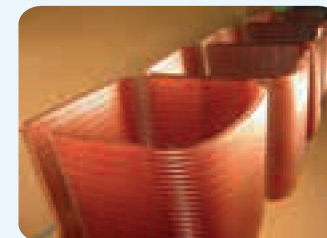
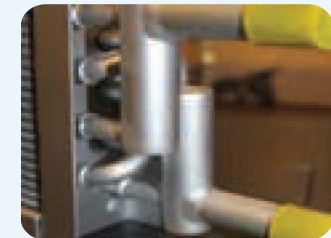
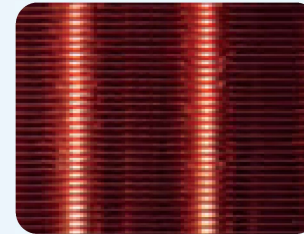
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DOLPHIN MANUFACTURING LLC HAS OVER 30 YEARS OF EXPERIENCE IN THE DESIGN, MANUFACTURE AND DEVELOPMENT OF FIN / TUBE HEAT EXCHANGERS.

We are a strong, dynamic and competitive company. Our heat exchangers are installed on sites and in applications Worldwide. This ranges from small HVAC systems to the larger, more complex applications such as Gas Turbine Air Intake Cooling Systems, Offshore and specialised Industrial Processes.

We have a modern state of the art manufacturing facility, totalling more than 6000 sq mts of covered surface. These consist of highly efficient production lines utilising the most up to date manufacturing machinery available to our industry. Our Research and Development Department is constantly developing our products, machinery and processes to keep up with the increasing demands and requirements of the market.

Our year on year turnover has steadily increased. This leaves us safe in the knowledge that our experience, competitiveness, quality and emphasis on growth and development is satisfying our existing customers across North America, Europe, Africa, Australia and Middle East, as well as attracting new ones from various industries.



APPLICATIONS



AIR HANDLING UNITS

We manufacture hot water, steam, chilled water, direct expansion and condenser coils for heating, cooling and heat recovery systems.

VENTILATION SYSTEMS

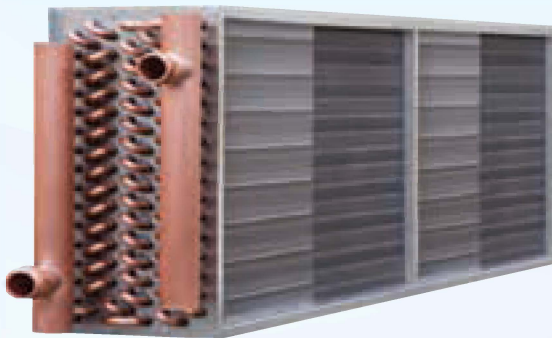
We offer duct mounted coils, which include airtight casing, drain tray and moisture eliminators as additional accessories.

HEAT PUMPS

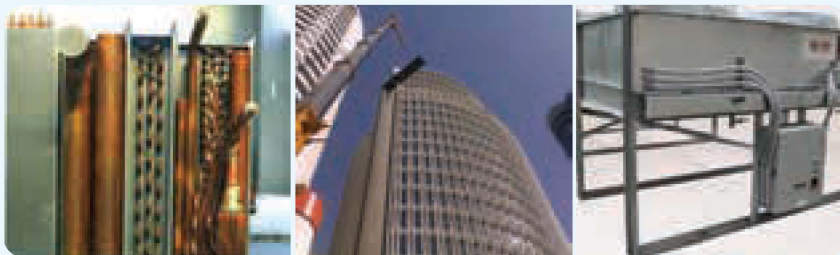
We offer coils for refrigerant heat pump systems with reverse cycle performance. During Summer/ Winter months, the same coil works as an evaporator (Cooling) or a condenser (Heating).

MARINE AND OFFSHORE APPLICATIONS

We specialize in design and manufacture of heat exchangers for the Marine and Offshore Industry. These include applications such as cruise liner air conditioning, engine room cooling, remote condensers and air handling units for offshore platforms.



APPLICATIONS



DRY AIR LIQUID COOLERS AND AIR COOLED CONDENSERS

We manufacture heat exchangers upto 13 mtr length, which we supply to a number of major Dry Air Liquid Coolers and Air Cooled Condensers manufacturers world wide.

FROST HEATING COILS FOR FILTERS PROTECTION

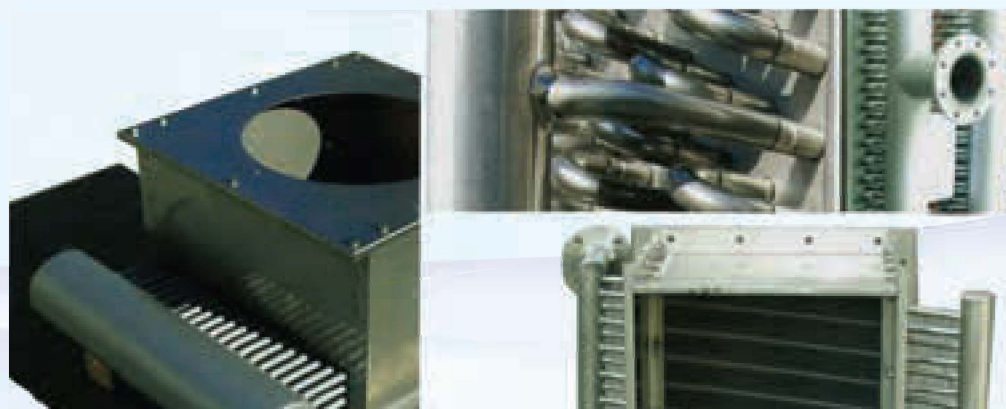
We produce coils working with hot water that can prevent particularly delicate and expensive filters from freezing.

OIL COOLING

We produce coils used for the cooling of machine lubricant oil, which are available with turbulators inside the tubes.

COOLING OR ANTI-FROST COILS FOR GAS TURBINE AIR INTAKE SYSTEMS AND ENGINES

We produce cooling coils for turbines inlet combustive air, manufactured with a special execution that can exclude the presence of moving parts that can potentially get detached in the airflow.

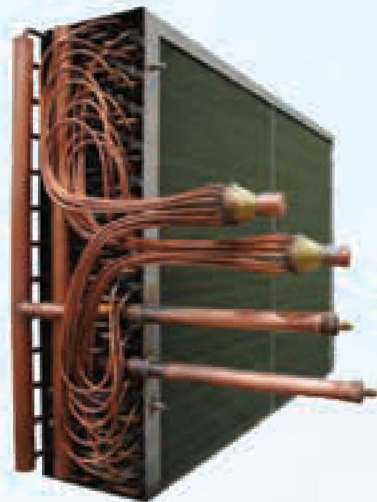


TEXTILE PLANTS

We manufacture heat exchangers with reinforced fins and wide pinch or bare tubes which can work with dirty air conditioning fibres or manufacturing residuals.

REFRIGERATION

We offer glycol / water, brine or direct expansion heat exchangers with wide fin pitch. Special drain trays, fixed or removable which can facilitate cleaning, are also available.



PAPER INDUSTRY

We offer heat exchangers for the heating of process air. These can work with steam, condensate, thermal oil or hot water. Finned-block, finned tubes or bare tubes execution are available.

DRYERS (CELLULOSE, PELLET, FOOD, ETC)

We produce heat exchangers that can continuously work with high temperatures. This design prevents any contact points between the tubes and the casing. We Provide with GI & SS End plates & Casings.



APPLICATIONS

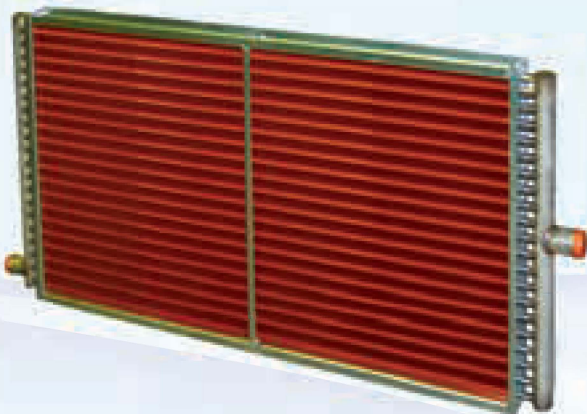


HEAT EXCHANGERS FOR CLEAN ROOMS APPLICATIONS

We offer various designs for installation in ducts, Fan Filter Units (FFU) or air handling units. Coils are supplied in several different materials, often together with stainless steel frames or powder painting.

CONTINUOUS FIN TYPE HEAT EXCHANGERS

Available in a wide range of materials, geometries and dimensions. This range of products includes water heating and cooling coils, evaporators, refrigerant condensers, diathermic oil heating coils and steam condensers.



INDUSTRIAL PROCESSES

These coils are used in the plastic industry, surface treatment machinery, painting booths, ovens and many more.

We are able to choose the best materials and thermodynamics sizing for the coils needed in many different industrial processes.

BARE TUBE HEAT EXCHANGERS

For high temperature (over 300 °C) or for applications in which airborne particles like fibres, oil or dust may obstruct the coil face area.

Specifically manufactured for hospital, clean room or pharmaceutical applications. Available in different diameters, thickness and materials.

GENERAL SPECIFICATIONS

- Standard Coils are manufactured with Copper tubes & Aluminium fins. Optional with protective coatings and Copper fins.
- All coils are provided with Copper headers. Optional with MS and SS headers.
- All AHU & FCU coils are provided with Brass threaded Male Adaptors / Connectors. Evaporator & DX Coils are provided with Brass Distributors. Air & Drain vents made of Brass are standard for Water Coils.
- We expertise in making different shape coils of all sizes like "C", "G", "L" and round shape in addition to the standard straight coils.
- The standard casing material for all coils is Galvanized Iron. Optional with Copper, Brass & Stainless Steel.

FIN CONFIGURATIONS



Corrugated Edge - Staggered Pattern Fins

Available in 2 to 6 Rows
Having 12 to 13 FPI
7/8" x 5/8" Triangular Tube
Pitch
5/16" Tube Dia
Tube-Spacing = 22.225 mm
Row-Spacing = 11.34 mm



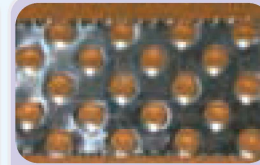
Corrugated Edge - Staggered Pattern Louvered Fins

Available in 2 to 9 Rows
Having 12 to 13 FPI
1" x 7/8" Triangular Tube
Pitch
5/16" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 18.24 mm



Corrugated Edge - Staggered Pattern Sine Wave Fins

Available in 2 to 6 Rows
Having 12 to 13 FPI
7/8" x 3/4" Triangular Tube
Pitch
3/8" Tube Dia
Tube-Spacing = 22.225 mm
Row-Spacing = 15.47 mm



Corrugated Edge - Staggered Pattern Fins

Available in 2 to 12 Rows
Having 12 to 13 FPI
25mm x 17.67mm Triangu-
lar Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25 mm
Row-Spacing = 12.49 mm



Corrugated Edge - Staggered Pattern Fins

Available in 2 to 6 Rows
Having 12 to 13 FPI
1" x 7/8" Triangular Tube
Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 18.24 mm



Corrugated Edge - Staggered Pattern Copper Fins

Available in 1 to 6 Rows
Having 11 to 16 FPI
1" x 1" Triangular
Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 22 mm



Corrugated Edge - Staggered Pattern Louvered Fins

Available in 1 to 12 Rows
Having 12 to 16 FPI
1" x 1" Triangular
Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 22 mm



Corrugated Edge - Staggered Pattern Louvered Fins

Available in 1 to 12 Rows
Having 8 to 16 FPI
1" x 1" Triangular
Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 22 mm



Corrugated Edge - In Line Pattern Fins

Available in 1 to 12 Rows
Having 4 to 12 FPI
1" x 1" Triangular
Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 25.4mm



Corrugated Edge - Staggered Pattern Sine Wave Fins

Available in 2 to 6 Rows
Having 12 to 16 FPI
1-1/4" x 1-1/4" Triangular
Tube Pitch
3/8" Tube Dia
Tube-Spacing = 31.75 mm
Row-Spacing = 27.49 mm

FIN CONFIGURATIONS



Corrugated Edge - Staggered Pattern Sine Wave Fins

Available in 2 to 6 Rows
Having 8 to 15 FPI
1-1/4" x 1-1/4" Triangular
Tube Pitch
1/2" Tube Dia
Tube-Spacing = 31.75 mm
Row-Spacing = 27.49 mm



Corrugated Edge - In Line Pattern Fins

Available in 1 to 9 Rows
Having 4 to 12 FPI
1-3/8" x 1-3/8" Square
Tube Pitch 1/2" Tube Dia
with heater hole
Tube-Spacing = 34.925 mm
Row-Spacing = 34.925 mm



Corrugated Edge - Staggered Pattern Fins

Available in 2 to 6 Rows
Having 12 to 13 FPI
1.6" x 1.6" Triangular Tube
Pitch
1/2" Tube Dia
Tube-Spacing = 40.64 mm
Row-Spacing = 35.19 mm



Corrugated Edge - Staggered Pattern Fins

Available in 1 to 9 Rows
Having 6 to 13 FPI
1-1/2" x 1-1/2" Triangular
Tube Pitch
5/8" Tube Dia
Tube-Spacing = 38.1 mm
Row-Spacing = 33 mm



Corrugated Edge - In Line Pattern, Sine Wave Fins

Available in 2 to 4 Rows
Having 12 to 13 FPI
1.5" x 1.5" Square Tube
Pitch
5/8" Tube Dia
Tube-Spacing = 38.1 mm
Row-Spacing = 38.1 mm



Corrugated Edge - In Line Pattern Fins

Available in 1 to 6 Rows
Having 5 to 12 FPI
2" x 2" Square Tube Pitch
5/8" Tube Dia with heater
hole
Tube-Spacing = 50.8 mm
Row-Spacing = 50.8 mm



Plain Staggered Pattern, Sine Wave Fins

Available in 1 to 12 Rows
Having 5 to 10 FPI
7/8" x 7/8" Triangular Tube
Pitch
3/8" Tube Dia
Tube-Spacing = 22.225 mm
Row-Spacing = 19.254 mm



Plain Edge - Staggered Pattern, Sine Wave Fins

Available in 1 to 12 Rows
Having 6 to 17 FPI
1" x 1" Triangular Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 22 mm



Plain Edge - Staggered Pattern - Copper Fins

Available in 1 to 9 Rows
Having 11 to 13 FPI
1-1/2" x 1-1/2" Triangular
Tube Pitch
5/8" Tube Dia
Tube-Spacing = 38.1 mm
Row-Spacing = 33 mm



Plain Edge - In-Line Pattern, Dimple Fins

Available in 1 to 4 Rows
Having 11 FPI
1.063" x 1.77" Rectangular
Tube Pitch
3/4" Tube Dia
Tube-Spacing = 27 mm
Row-Spacing = 44.96 mm

NEW DEVELOPMENTS (FINS)



Plain Edge - Staggered Pattern, Hydrophilic Precoated Louvered Aluminium Fins

Available in 1 to 18 Rows
Having 12 to 18 FPI
21mm x 16.48mm
Triangular Tube Pitch
7mm Tube Dia
Tube-Spacing = 21 mm
Row-Spacing = 12.7 mm



Plain Edge (Pyramid Fins) Staggered Pattern, Fins

Available in 1 to 12 Rows
Having 10 to 17 FPI
1" x 1" Triangular Tube Pitch
3/8" Tube Dia
Tube-Spacing = 25.4 mm
Row-Spacing = 22 mm



Louver / Sine Wave Ripple Edge Fins

Available in 1 to 8 Rows
Having 7 to 16 FPI
1.25" x 1.25" Triangular Tube Pitch
1/2" Tube Dia
Tube-Spacing = 31.75 mm
Row-Spacing = 27.49 mm

TUBE SIZES (Plain & Inner Grooved)

Tube O/D	Tube Thickness
7 mm	0.25 mm
5/16"	0.28 mm
3/8"	0.30 mm
	0.40 mm
	0.50 mm
	0.90 mm
1/2"	0.50 mm
	1.00 mm
5/8"	0.50 mm
	1.00 mm
3/4"	1.27 mm

* Coils are also offered in => Carbon Steel Tube; Stainless Steel Tube; Cupro Nickel Tube; Aluminium Brass Tube upto 2 mm thickness.

PROTECTIVE COATINGS

We offer protective coatings to enhance the life of the condenser and evaporator coil which carries upto 7 years warranty.

THERMOGUARD

High Efficiency Anti-Corrosive Coating for HVAC Equipment.

Extended Coil Durability

Anti - Corrosive

Excellent Chemical Resistant

UV resistant Non-flaking

Exterminate Pressure Drop Power Saving

All Weather Resistant Peak Performance Output

Dolphin

Exclusive agent for **THERMOGUARD**

the ultimate corrosion resistant!!!



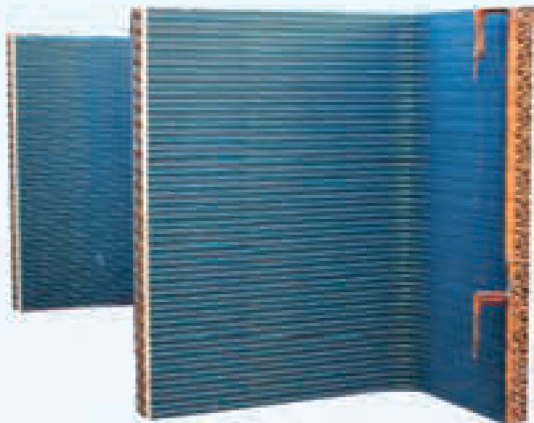
HYDROPHILIC COATED FINSTOCK

100% Coverage

Uniform coating on surface

100% Bonding

No colour change



HERESITE PHENOLIC COATING

Elimination of costly metals

Smooth surface promotes reduced clogging of fins

Special airless gun spray coating

Good thermal conductivity

Resistance to corrosive environments



WHY DOLPHIN GROUP ?

FLEXIBILITY IS OUR STRENGTH

We can easily adapt to your standard. We design according to your requirements, no matter how complex. We deliver when you want it, on time.

RELIABILITY

Our customers can rely upon the answers our technical office gives them. In an industrial sector where the technical content is so elevated, is extremely important to develop a strong trust-based relationship with the customer.

EXPERIENCE IS VALUABLE

Established over 30 years ago, Dolphin Manufacturing LLC has amassed knowledge in all sectors of the heat exchanger industry, from HVAC to Process to Offshore applications and many more.



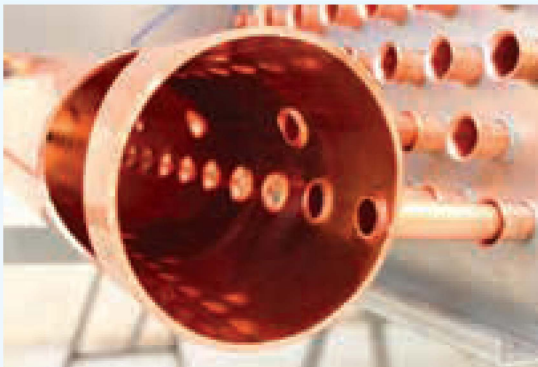
EXPERTISE OF OUR STAFF

From our Sales Agents to our Application Engineers to our Technical Department, we are always available to advise and help our customers to come up with the most suitable and cost effective solution to their requirements.



RELIABILITY IN OUR PRODUCT AND SERVICE

Dolphin Group with a large manufacturing facility, more than 2000 employees with 30 years of experience in heat transfer industry, are perfectly positioned to fulfill our clients requirements. We service the market leaders for the most critical applications.



QUALITY

Ensuring product quality is the cornerstone of everything we do, we believe that this quality comes hand in hand with the internal procedures which we have in place.

We are continuously investing in product certification, manufacturing techniques and in our quality system. Our company policy, which focuses on quality, aims at the optimisation of our internal procedures, allowing us to manage many different types of project. This allows us to guarantee the quality of all of our products, with the maximum attention to every detail. In order to reach our goals we daily produce project specific Quality and Test Plans, offer materials traceability and quality certificates and carry out continuous visual and dimensional checks.

PRODUCT CERTIFICATION*

AHRI 410 "Forced Circulation Air Cooling and Air Heating Coils"



This is an American certification on continuous fin type heat exchanger performance with forced air circulation. The operating conditions, including both the fluid and airside pressure drop, are certified by an independent research organisation which, every year, carries out laboratory tests which verify that what is published on the technical catalogues and selection software is true and reliable.

QUALITY SYSTEM CERTIFICATION



Our Quality System is certified according to the ISO 9001:2008 normative. We are also ISO 14001:2004 and OHSAS 18001:2007 certified. It aims to a continuous improvement of our company performance.

* This certifications herewith listed might not be available for each product on the catalogue. For further information please contact our sales department.



MANUFACTURING FACILITY

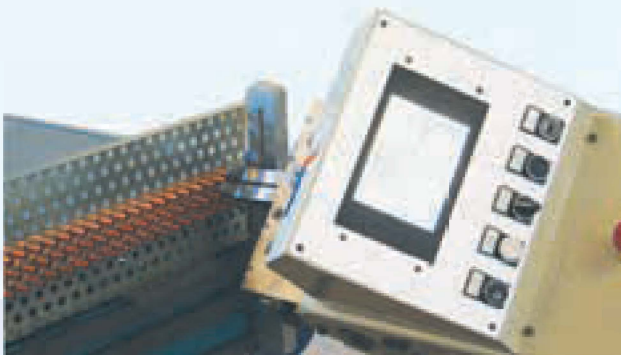
To meet our customer's demand with regards to quality and service, state of the art production machinery is not enough on its own. In addition we have developed and implemented aided design and ERP software.

DESIGN

Our technical office utilises software application which is one of the best in the industry. Each component and sub-component is modelled and evaluated by our expert design team. This facility allows us to eradicate, at the design stage, any possibility of production problems when issued to the factory.

Extracted from the 3D model is all of the information necessary to program our CNC machinery. These include the fin press, tube forming and header drilling machinery, all of which are of paramount when planning the heat exchanger production process.

Every requirement and all technical information regarding each and every project is stored internally in our system. This allows all information that is attained to be readily available to all of our employees, from design and production through to quality control and final inspection of goods.



MANUFACTURING TECHNOLOGIES

We utilise only the most technologically advanced machinery, provided by the best suppliers on the market. This allows us to guarantee our customers high quality products.

All our production lines are highly automated, which allow us to reach maximum operational flexibility and in turn results in short delivery lead-times, if compared with the market average, especially during peak season.

MANUFACTURING CONTROL

We are able to daily monitor our production progress instantaneously. Furthermore, we can evaluate our workload day by day, thus predicting possible critical situations. This process allows us to act accordingly, eradicating any delays, thus resulting in the satisfaction of our customers.

We are also able to offer precise and prompt information about manufacturing progress and delivery status.



ALUMINIUM TUBE / ALUMINIUM FINS

Heat Exchangers

Replacement for Copper Tube / Aluminium Fin Heat Exchangers



ALL - ALUMINIUM FIN AND TUBE HEAT EXCHANGERS - BENEFITS

The heating ventilation, air conditioning and refrigeration HVAC-R industry has been using mechanically assembled copper tubes and aluminium fin solution for years. Replacing the copper tubes with aluminium tubes provides real benefits:

1. COST EFFECTIVE

The price of aluminium raw material is one-fourth the price of copper. This will definitely reduce your cost.

2. WEIGHT PER METER

Aluminium tubes are 35% lighter than copper, for equivalent burst pressure. This improves system weight significantly.

3. CORROSION RESISTANCE

The Corrosion rate of aluminium is very low when exposed to most environmental conditions, because aluminium is protected by a stable oxide layer. In all aluminium heat exchangers, due to a closer galvanic balance between fin and tube, this will occur far later than in a mixed metal – copper tubes and aluminium alloy selection.

4. PERFORMACE

In an aluminium fin and tube heat exchangers, the tubes have the same thermal expansion coefficient as aluminium fin stock. The bond between tube and fin will be constant regardless of temperature ,thus ensuring better heat transfer. In addition, aluminium has less spring - back effect than copper.

5. RECYCLABILITY

Aluminium recycling is important for resource preservation. There is no need to separate different materials in an all-aluminium heat exchanger, thus making recycling easier.

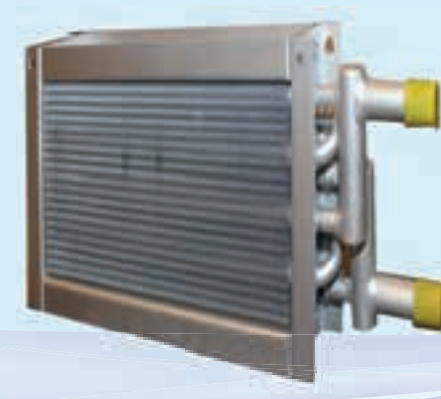
ALUMINIUM TUBES V/S COPPER TUBES

If light weight and high performance are your requirements, then select aluminium for your HVAC-R applications, which will provide lighter equipment devices than using copper tubes

	Outside Diameter(mm)	Wall Thickness(mm)
Copper tube (dia)	9.52	0.30
Aluminium Tube (dia)	9.52	0.76
	Outside Diameter(mm)	Wall Thickness(mm)
Copper tube (dia)	7	0.25
Aluminium Tube (dia)	7	0.50



	Round tube mechanical expanded (Cu tube/ Al fin)	Round tube mechanical expanded (Al tube/ Al fin)
Required space	100%	100%
Tube weight	100%	66%
Heat exchanger weight	100%	83%
Tube cost per heat exchanger	100%	30% - 50%
Burst Pressure	100%	100%





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