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SUNNYSTEEL

Professional Supplier of Fin Tubes

环 保 Environment Protection

节 能 Energy Conservation

高 效 Highly Efficient

fin / finned tubes

APPLICATION FIELD
应用领域

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Extruded finned tube

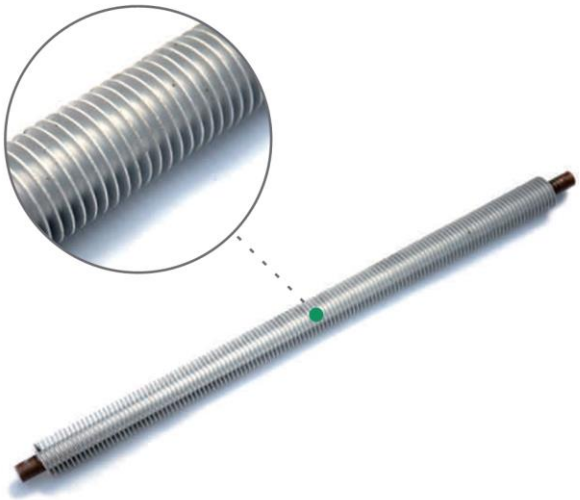
Extruded finned tubes are bimetallic tubes whose outer aluminum surface is finned by cold plastic deformation.

Steel Aluminum composite finned tube

The processing technology of cold-rolled aluminum-steel finned tube is that aluminum tube and steel tube are first processed into bimetallic composite tube, and then the fin is formed after mechanical cold-rolling. Based on the physical characteristics of aluminum tube, the finned tube with steel tube as the core and aluminum fin formed by cold-rolling is made into one. It is widely used in steel, petroleum, chemical industry, machinery, shipbuilding, power station, hospital and food industry.

1. High heat transfer performance and low contact thermal resistance;
2. The contact area between fin and tube is large, and the joint is tight and reliable;
3. Good corrosion resistance and stable long-term performance;
4. The fin has good rigidity and is not easily deformed.

Copper Aluminum Composite Finned Tube



Copper-aluminum composite finned tube is made of copper-aluminium composite tube after compounding and then rolled. It has the characteristics of close combination, small thermal resistance, good heat transfer performance, high strength, small flow loss, strong corrosion resistance, low deformation and long working life under long-term cold and heat conditions. When wet cooling is carried out in heating and air conditioning,condensation water on the surface of fin is easy to beremoved,and it is not easy to form dust and scale in coaxial heating and other heat exchange occasions.

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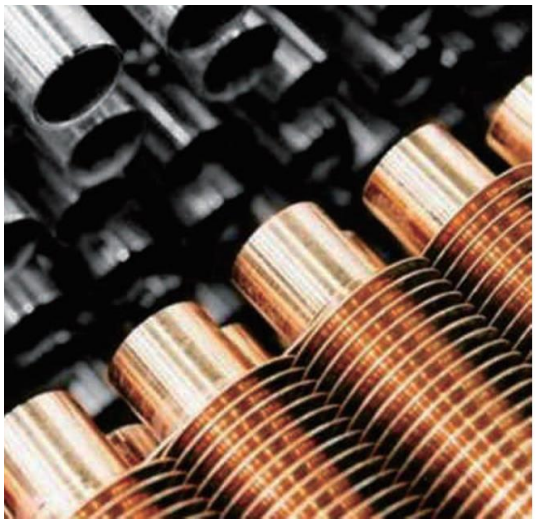
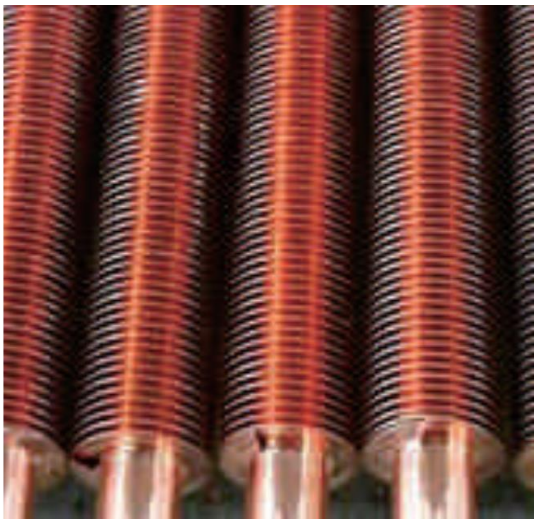
Pure Aluminum Composite Finned Tube

Single metal composite finned tube is rolled from aluminum tube as a whole. Pure aluminum rolling finned tube has no contact thermal resistance, high strength, heat resistance and mechanical vibration, good thermal expansion performance and considerable expansion heat exchange surface.





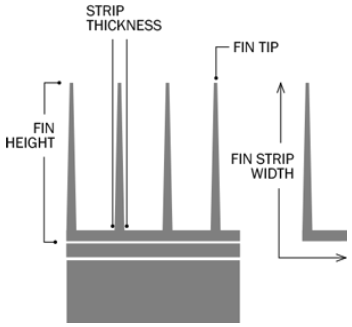
Pure Copper Composite Finned Tube

Copper finned tube is a type of heat exchanger element. In order to improve the heat exchange efficiency, fins are usually added on the surface of the heat exchange tube to increase the external surface area (or internal surface area) of the heat exchange tube, so as to achieve the purpose of improving the heat exchange efficiency. The integral rolling fin tube has no contact thermal resistance, good heat transfer performance, high strength, heat resistance and mechanical vibration resistance, and good thermal expansion performance.

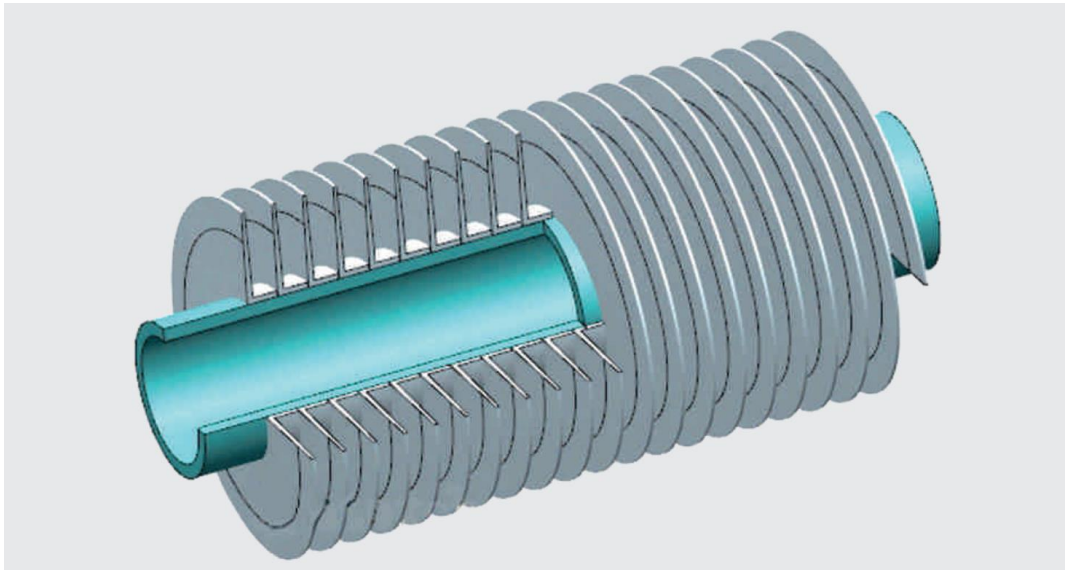
Spiral Wound Finned Tube

Spiral wound finned tubes are designed to maximize heat transfer efficiency in various industrial applications.

L-type Spiral Wound Finned Tube



The trapezoidal section formed by rolling L-shaped finned tube is consistent with the distribution of heat flow density, and the tubes are closely combined with high thermal efficiency, thus eliminating the contact thermal resistance caused by the gap between the fins. Working temperature: 230'℃ Characteristics: winding process, high production efficiency, uniform spacing good heat transfer, high fin ratio, the base tube can be protected from air erosion.



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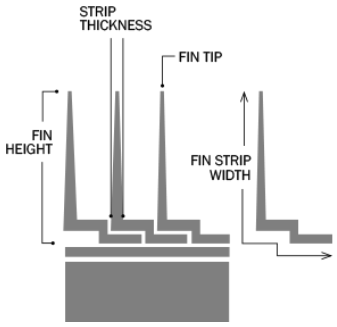
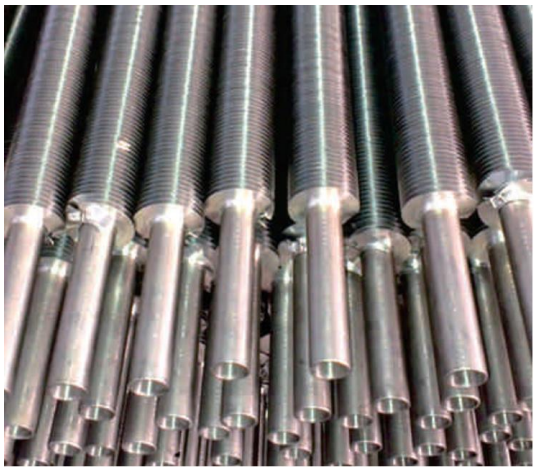
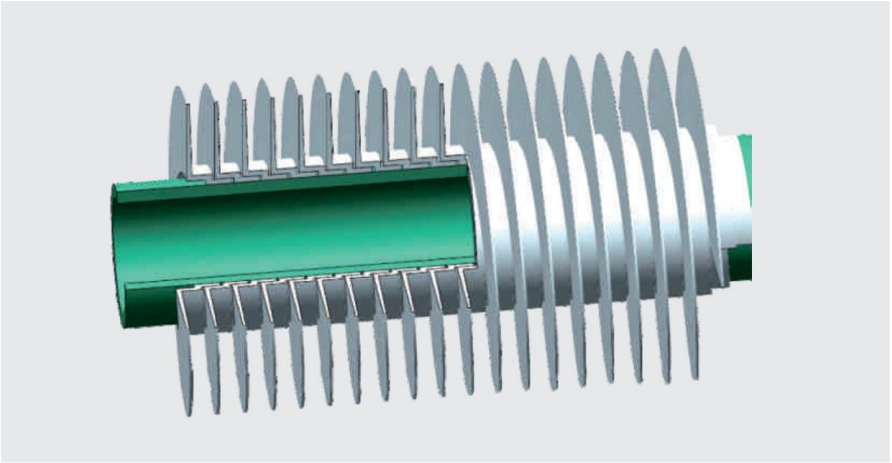
LL-type Spiral Wound Finned Tube

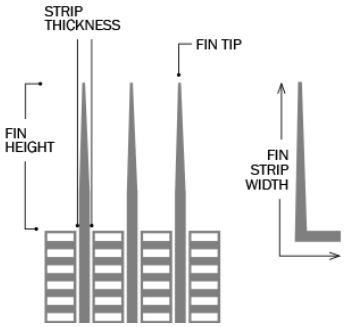


LL type spiral wound fined tube: on the basis of L-type, the root of the fin is completely covered on the outer surface of the base tube, which can strengthen the contact surface and increase the heat transfer effect. Maximum working temperature: 170 ℃.

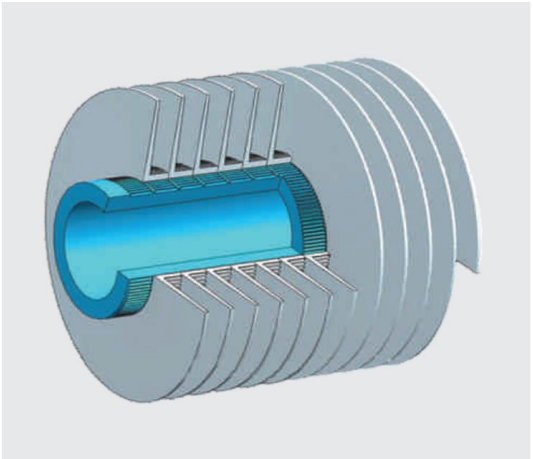


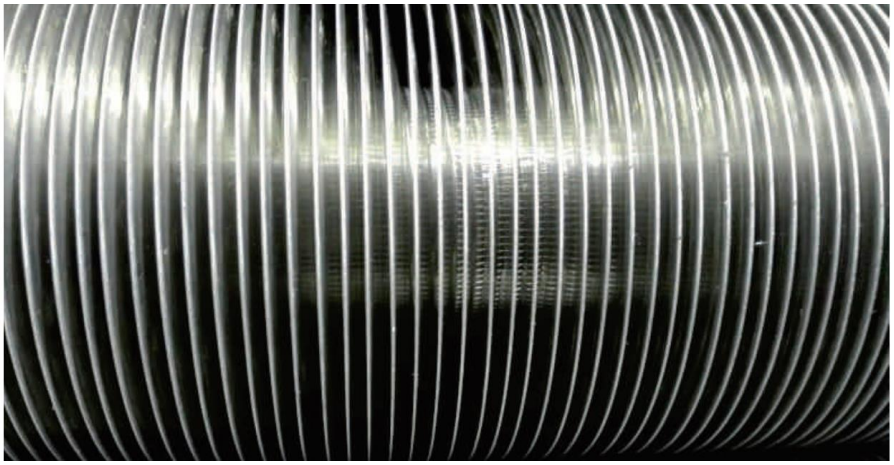


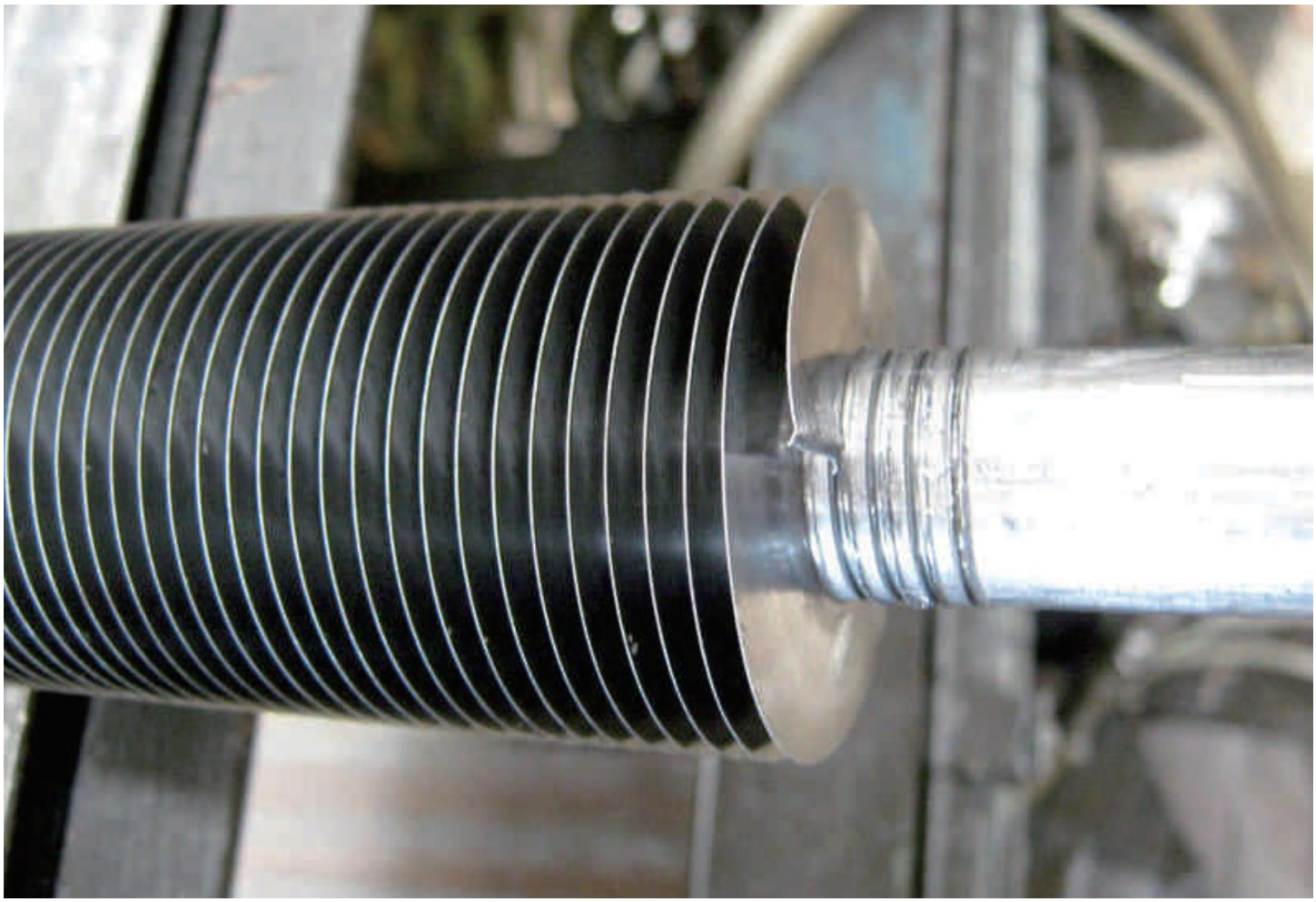
KL-type Spiral Wound Finned Tube



KL type fin tube, also known as knurled fin tube, is to roll the pattern on the base tube before winding the fin, or install a blade on the winding machine to knurl on the base tube and the back blade is used for winding, knurling and winding at the same time. The maximum service temperature is<250℃, and the maximum service pressure is <3.2Mpa.







Embedded Finned Tube

The fins are manufactured by embedding the fin strip into a groove formed on the base tube.

The Fin is allowed to be placed in the groove and then the backfilling of the groove is carried out to ensure firm adherence of the fins to the base tubes.

- Processing technology: fins are firmly embedded in the outer surface of the base tube with mechanical grooves;
- Base tube material: carbon steel, alloy steel, stainless steel, dual phase steel, copper tube;
- Fins: Aluminium 1060, Aluminium 1100, T2 copper;

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Application Area

Spiral wound finned tubes find extensive applications in various industries due to their excellent heat transfer capabilities and durability. Some of the key industries where they are commonly used include:

- Petroleum, chemical, and petrochemical industries
- Natural gas processing
- Steel industry: blast furnace and converter system
- Power generation: steam turbine flue gas condensation, condensation water contact cycle cooling condensation, fossil and nuclear power plants
- Air conditioning (Freon, ammonia, propane)
- Waste incinerators
- Compressor coolers, etc.

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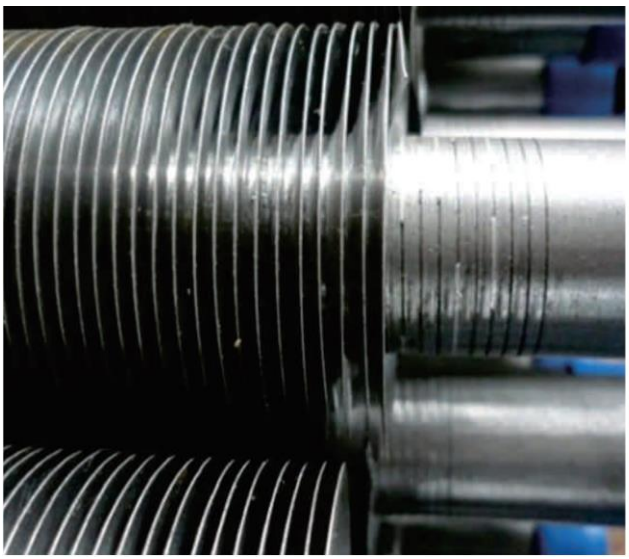
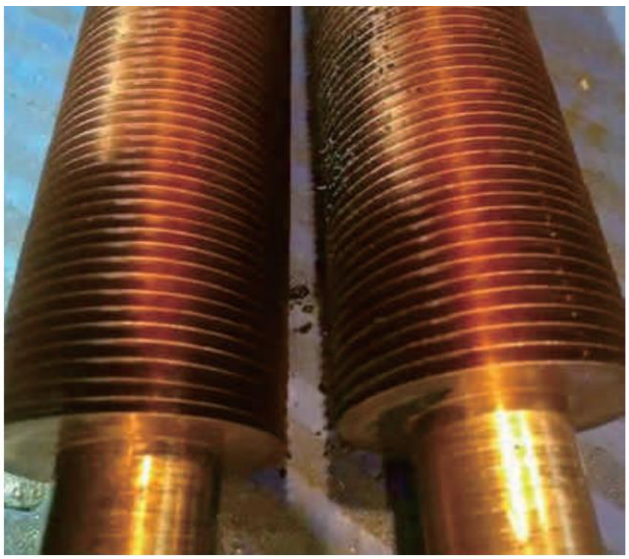




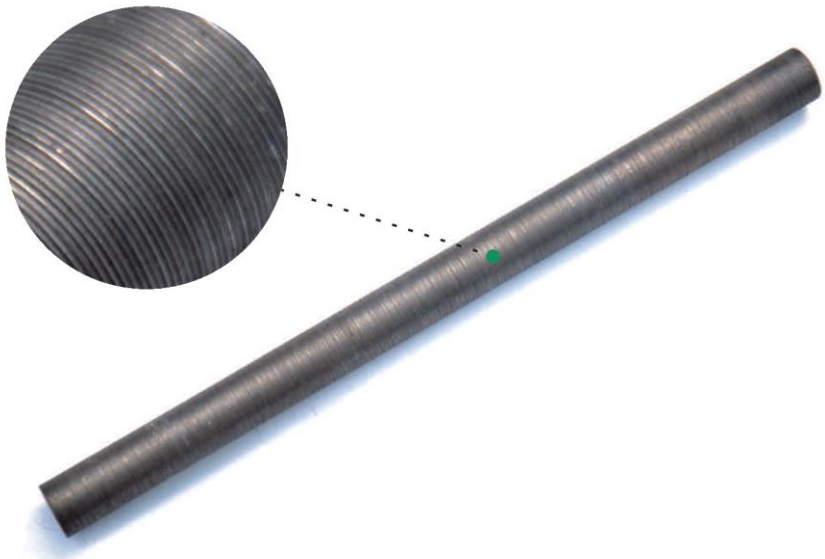
Corrugated Heat Exchange Tube

Corrugated heat exchange tubes are widely used in various industries for efficient heat transfer and thermal management.

Low Finned Threaded Tube

Low Thread Finned Tube is a type of high efficiency heat exchanger tube that is rolled to form spiral fins on its outer surface.

The reinforcing effect of this type of tube is on the outside of the tube. On the one hand, the heat transfer area is enlarged by the spiral fin; on the other hand, when the shell side medium flows through the surface of the finned tube, the surface spiral fin has a seaming effect on the laminar flow side layer, which reduces the thickness of the boundary layer; in addition, the turbulence formed on the surface is stronger than that of the smooth tube, which further reduces the thickness of the boundary layer. The results show that the tube has a high heat transfer capacity. When the tube is used for evaporation, the number of bubbles on the unit surface can be increased, and the boiling heat transfer capacity can be improved. When the tube is used for condensation, the threaded fin is very conducive to the drop of condensate at the lower end of the tube, making the liquid film thinner, reducing the thermal resistance and improving the condensation heat transfer efficiency. It is suitable for the shell side medium is relatively clean, no corrosion, no scaling, can use low thread finned tube as heat exchanger element to form low thread finned tube high efficiency heat exchanger.



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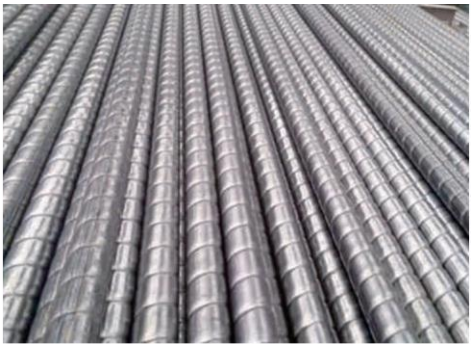

Spiral Pipe

Function of threaded pipe

The threaded tube serves several important functions in various industries:

- **Enhanced Heat Transfer Capacity**: By optimizing heat transfer and flow resistance, the heat transfer capacity of a spiral flue pipe is equivalent to 1.7-1.8 ordinary flue pipes of the same size. This reduces the number of flue tubes required and also decreases the diameter of the casing. In the air conditioning and refrigeration industry, compared with ordinary smooth tubes, the heat transfer surface area of threaded tubes is increased by 1.5-2.0 times, significantly improving refrigerant flow and enhancing boiling and condensation heat transfer within the tube.

- **Reduced Pressure Loss**: The use of screw threads in the tube reduces the pressure loss of the refrigerant by more than 50%. This results in smaller and lighter air conditioners, saving approximately one third of the weight of pipe material compared to smooth pipes, leading to energy and cost savings.

- **Applications in Heat Exchangers**: Threaded tubes, typically made of steel or stainless steel, feature a spiral scale on their surface due to rolling by machine tools. During equipment operation, temperature changes cause the pipe to expand and contract, facilitating the self-shedding of the scale layer. In contrast, smooth pipes have scale layers that lack self-shedding force. Threaded tubes are widely used in power plant condensers and boiler auxiliary heat exchange systems, offering an ideal alternative to smooth pipes and copper pipes.

T-shaped Finned Tube

T-type finned tube is suitable for the shell-side medium is relatively clean, no solid particles, no gum. T-type finned tube can be used as heat exchanger element to form T-type finned tube high-efficiency heat exchanger, so as to improve the effect of shell-side boiling heat transfer.

- The heat transfer effect is good. In R113, the boiling heat transfer coefficient of T-tube is 1.6-3.3 times higher than that of smooth tube;
- In conventional smooth tube heat exchanger, only when the temperature of the hot medium is higher than the boiling point or bubble point of the cold medium by 12℃-15℃, the cold medium will bubble and boil. However, the T-type finned tube heat exchanger only needs the temperature difference of 2℃-4℃, and the cold medium can boil, and the bubbling is fine, continuous and fast, which is a unique advantage compared with smooth tube;
- The experimental results show that the boiling heat transfer coefficient of T-tube is 10 times that of smooth tube; the total heat transfer coefficient of small tube bundle with liquid ammonia is 2.2 times that of the smooth tube; the industrial calibration of the reboiler of the C3 and C4 hydrocarbon separation tower shows that the total heat transfer coefficient of the T-tube is 50% higher than that of the smooth tube at low load and 99% higher at high load;
- It is cheaper than the aluminum porous surface heat transfer tube;
- As the gas-liquid disturbance inside the tunnel is very intense and the gas is ejected along the T-groove at high speed, it is not easy for scale to form inside the T-groove or on the outer surface of the tube, which ensures that the equipment can be used for a long time without the effect of scale on the heat transfer effect.

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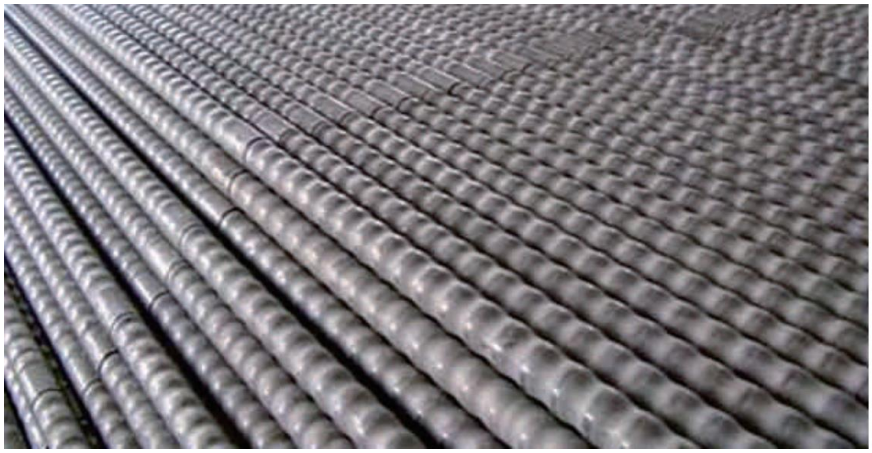
Expansion Wave Tube

An expansion wave tube is a specialized tube used in various industries for specific purposes.



Here are some key points about expansion wave tubes:

High heat transfer efficiency
The special wave crest and trough design of the expansion wave tube makes the fluid flow form strong turbulence by continuously changing the cross section inside and outside the tube. Even under the condition of very small flow rate, the fluid can form strong disturbance inside and outside the tube, which greatly improves the heat transfer coefficient of the heat exchanger tube, which is 2 ~ 3 times higher than that of the traditional tube heat exchanger.

No pollution, no blockage, no scaling, stable operation
In the working process of the expansion wave tube, on the one hand, the medium inside and outside the tube is always in a highly turbulent state, which makes it difficult for the solid particles in the medium to deposit and scale; on the other hand, affected by the temperature difference of the medium, the expansion wave tube will produce a small amount of axial expansion deformation, and the curvature inside and outside the tube will change frequently. Because of the large difference between the linear expansion coefficient of the scale layer and the expansion wave tube, the fouling and the heat exchanger tube are different. Even if there is scale deposition, it will break and fall off automatically, so the heat exchanger can always maintain long-term and efficient heat transfer performance. At the same time, the pipe channel is large, the pressure drop is small, the energy saving effect is obvious, and there is no clogging problem.

It has an automatic compensation function.
The special structural shape of the expansion wave tube can effectively reduce the thermal stress under the condition of heating without adding an expansion joint, thus simplifying the product structure and improving the reliability of the product.

Reliable, safe and strong
The sealing perimeter of the product is short, and the existence of wave crest and wave trough enhances its axial expansion and contraction ability, effectively reduces the temperature difference stress, and can adapt to the change of large temperature difference and pressure, so as to avoid leakage caused by pipe orifice rupture. The unique joining technology of baffle plate and corrugated tube prolongs the service life of the heat exchanger. The heat transfer efficiency of the external expansion corrugated tube is better than that of the conventional internal pressure corrugated tube.

Welded Finned Tube

Our welded finned pipes are used in the power generation, petrochemical, oil refining industries and in industrial processing equipment and can be manufactured to meet ASME "U" and "S" stamp certifications.

Spiral High Frequency Welding Finned Tube

Spiral high frequency welding finned tubes are specialized tubes used in various industries for heat transfer applications.

1. Due to the high welding speed and strong self-cooling effect, the heat affected zone is small and oxidation is not easy to occur. Therefore, the microstructure and properties of the weld are very good;
2. Corrosion resistance, wear resistance, low contact thermal resistance, high stability, anti-ash ability;
3. The heat exchange surface is large;
4. Reduce the installation space of the required heat transfer surface;
5. At the same time, it has high reliability;
6. The pressure drop on the tube side is reduced and the operating cost is reduced;
7. Improve the stiffness and seismic performance of the steel tube;
8. Heat transfer and metal flow are reduced.

Our flexible production scheduling provides quick product turnaround, allowing you to minimize downtime during emergency repairs or scheduled downtime when ordering replacement parts, or to meet production schedules when ordering OEM parts.

Studded Tube

Studded tubes have studs welded to the metal tube. These studs are arranged in a specific formation along the length of the tube. They are commonly used in boilers and refineries. As they increase the surface area for higher heat transfer, they are used for reheating.

The nail head tube is also called nail like ribbed tube. In petrochemical industry, nail head tube is widely used. Especially in the convection chamber of the tube furnace, in order to improve the heat transfer effect outside the tube, the heat transfer element often adopts the nail head tube.

Serrated Spiral High Frequency Welding Finned Tube

Serrated spiral high frequency welding finned tubes are specialized heat transfer components designed for efficient heat exchange in various industrial applications.
Serrated spiral high frequency welding finned tubes are widely used in various industries for heat transfer applications. The serrated fin design increases the surface area for better heat exchange efficiency. High frequency welding ensures strong bonding between the fins and the tube, providing durability and excellent performance under high temperature and pressure conditions.

Performance features:
Installation is simple and economical. The maximum length of high-frequency welded spiral fin pipe can reach 6 meters, which reduces the number of connection points, makes installation more economical and faster, and reduces the likelihood of water leakage at the joint.
It is easy to maintain. No maintenance is required after installation of the high-frequency welded spiral fin pipe.
High efficiency, high frequency welding spiral fin tube for fin and steel tube winding full contact welding, heat dissipation area is more than 8 times of smooth tube. Internal more smooth, internal flow resistance is small.
Long service life, high mechanical strength of fin and tube combination, tensile strength of more than 200MPa, both inside and outside of the tube are hot-dip galvanized.

H-type And Double H-type Finned Tube

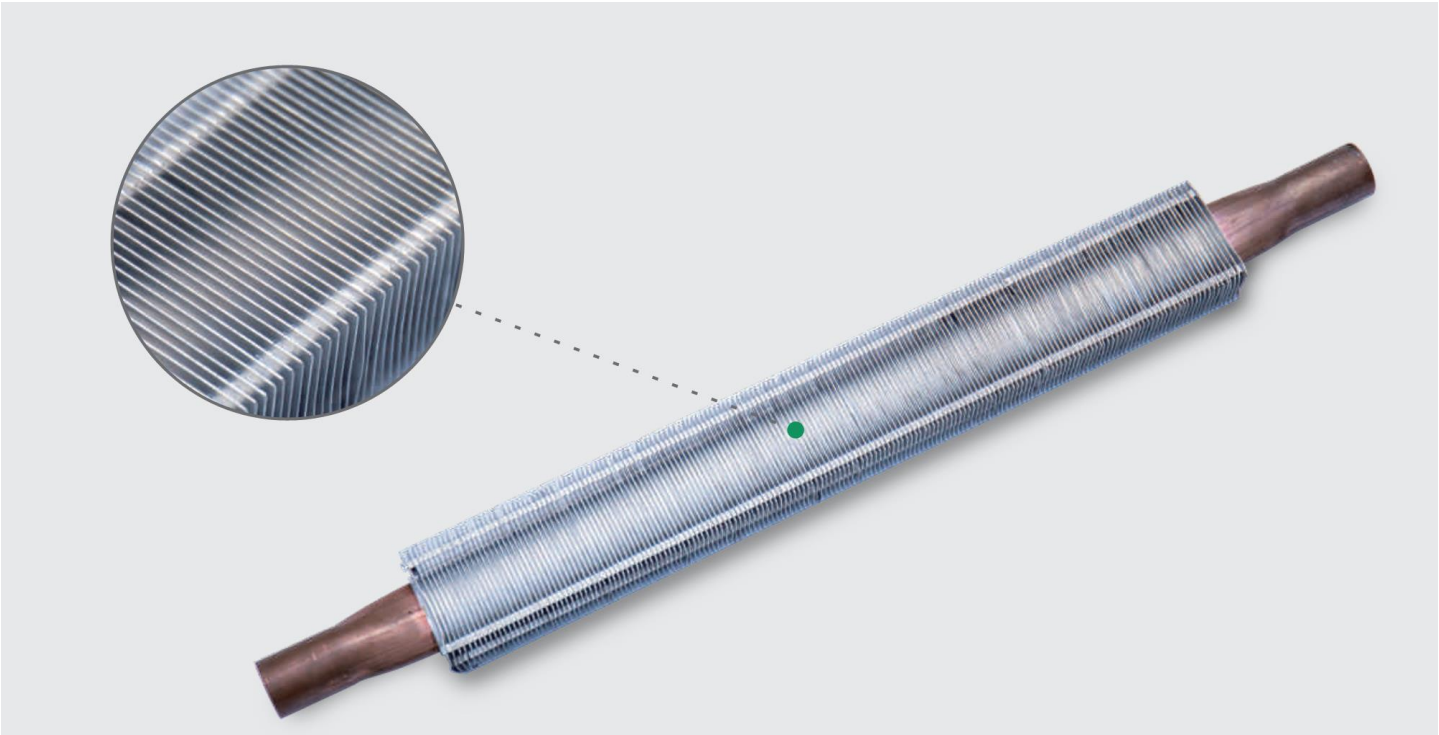
1. The fin is divided into two symmetrical halves. The tube wall is pressed down from both sides and resistance welding is used to weld on the tube wall with a certain gap left in the middle;
2. Two circular tubes can share a group of fins, called double tube H-fin, or a single tube H-fin can be placed in the middle;
3. The H-finned tube heat exchanger is closely packed and the tube bundles are arranged in sequence;
4. The fins are parallel and independent of each other, and there is no influence of the helix angle, so it is easy to remove the ash.

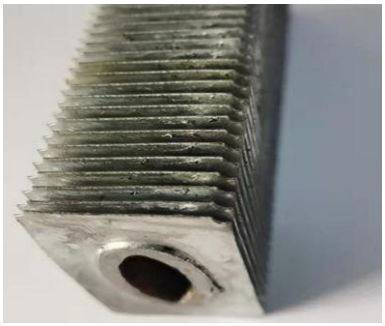
Elliptical Finned Tube

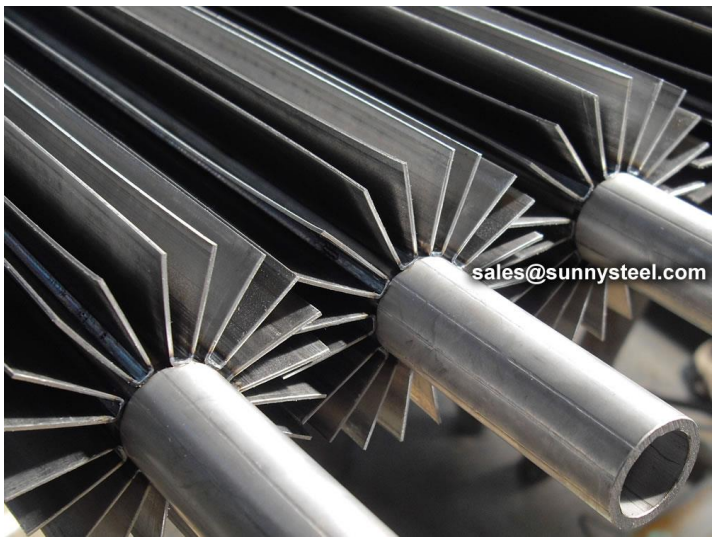
Elliptical Finned Tube is an elliptical seamless tube with a base tube that has aluminum fins or copper fins wrapped spirally and tightly around the outer surface of the base tube under tension.

The finned tube is connected to the pipe piece by piece. As the tube is often not round (especially welded steel tubes), there is inevitably a gap between the fin and the tube wall. If there is a gap, there is a gap thermal resistance. For this reason, the following measures are often used: resistance welding method, dip coating method, contact welding method and tube expansion method.

The utility model provides a technology to make the tube and fin close together and improve heat dissipation. It prefabricates the inclined edge hole on the string piece to reserve the interference material, and then retracts it to make the tube and fin form the extrusion of contour peak and contour valley. It can realize the seamless combination under the normal temperature condition without welding, sticking and filing other materials, so as to make it a high efficiency heat sink. In radiator, heat exchanger, shower water heater and so on, this technology can save tin and chemical adhesive.







Longitudinal finned tubes

Longitudinally finned tubes are made by resistance-welding fins along the length of the tube.

The fins first form a U-shaped channel so that each U-leg forms a fin. The channel is cut to length, aligned and resistance welded along the length of the tube. The channel is welded in pairs, opposite each other, so the number of fins specified must be a multiple of four.

1. Improve heat transfer efficiency in the effective space;
2. Reduce the footprint of the required heat transfer area;
3. At the same time, it has high reliability;
4. The pressure drop on the tube side is reduced and the operating cost is reduced;
5. Improve the stiffness and seismic performance of the steel tube;
6. Heat transfer is enhanced to reduce flow resistance and metal consumption.

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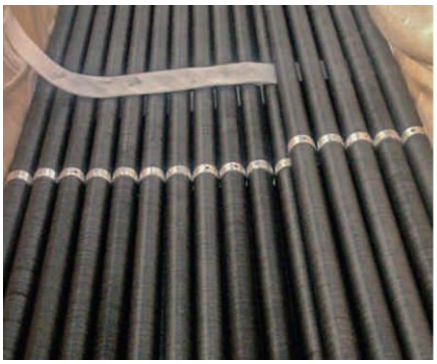
Pipe Hoop/ ZINC ring

The isolation ring is suitable for aluminum finned tube, extruded finned tube and L/ll / KL finned tube, and is most commonly used in G-based finned tube.

Material: aluminum, galvanized steel, stainless steel
Size: O.D.:63.5mm, O.D.:73.5mm, etc
Used to fin type: L. LL. KL. G-type finned tube
Shape: round, hexagonal, octagonal.
Embedded aluminum finned tube circular spacer box.



The general flexible core tube of finned tube: the outer diameter is 25.4mm，31.75mm and 38.1mmrespectively

Main Materials of Finned Tube Support Collars

Typically, finned tube support collars are made of corrosion-resistant materials to ensure durability and compatibility with operating conditions. Common materials include:

- Stainless Steel
- Aluminum
- Galvanized Steel
- Silicone Rubber

Other materials used in finned tube collars include cast-zinc, silicon, and metal bands. These materials are selected based on the specific requirements of the heat exchange system and the type of finned tubes used.

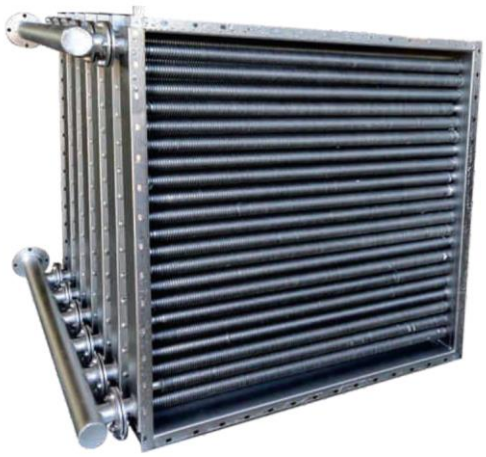
Radiator

A radiator is a heat exchanger used to transfer thermal energy from one medium to another for the purpose of cooling and heating. The majority of radiators are constructed to function in automobiles, buildings, and electronics.

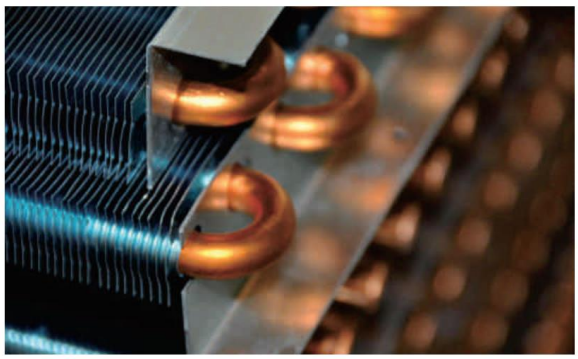
Steel Radiator

Steel radiator has the characteristics of compact structure, good air tightness and convenient installation. It is suitable for both steam system and hot water system. It is widely used in air heating system of heating ventilation and drying equipment in large buildings.

Structural Specification: The steel radiator is manufactured and produced according to the standard atlas, which is composed of carbon steel frame and carbon steel cooling pipe (carbon steel heat pipe). The steel radiator is fixed by frame, with compact structure, good air tightness and convenient installation. Working medium: steam(<1.0MPa),hot water(<130℃).



Aluminum Radiator



Aluminum finned tube air heater is a new type of air heater improved on the basis of steel finned tube air heater. The heat exchange element of the product is made of steel tube. Aluminum "L" type finned tube, and the working temperature can reach 230℃. It has the advantages of tight contact, no wrinkle, no dust accumulation, good vibration resistance, and can protect the tube from air erosion. Compared with the steel radiator, the heat dissipation area is increased by 10.20%, the weight is reduced by about 30%, and the heat can be increased by 10-20% under the same working conditions. It is suitable for steam and hot water systems. It can be widely used in air heating, material drying and air conditioning systems.

or hot water, the working pressure of steam is 2.6 MPa, and the
perature of hot water is
70-130℃.

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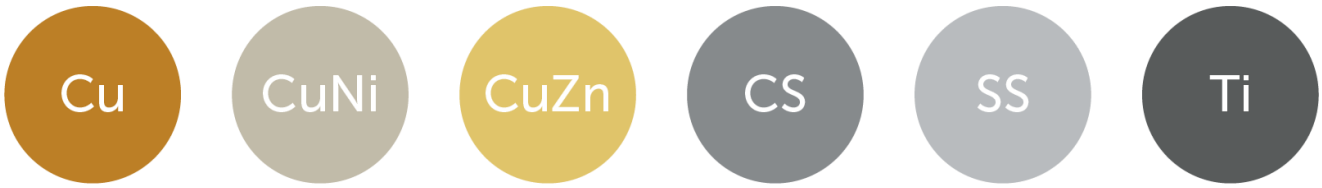


Material

We offer you a broad portfolio of materials and can expand our offerings at any time to meet your specific needs regarding thermal conductivity, mechanical properties, or corrosion resistance.

For Aluminum L-Foot finned tubes, the fin material is aluminum, either 1100-0. The tube material is generally carbon steel, stainless steel, or brass; however, the tube can be of any material.

For Welded Helical Solid and Welded Helical Serrated finned tubes, the fin and tube materials can be any combination that can be welded together using HIGH FREQUENCY WELDING process.

The materials chosen for a given application are a function of service temperature, corrosive environment, and/or erosive environment. Common tube materials used for our welded product lines include: carbon steel, carbon moly, chrome moly, stainless steel, Inconel, and Nicolay. Common fin materials include: carbon steel; stainless steels of types 304, 310, 316, 321, 409, and 410; Nickel 200, and Inconel.

Carbon steel fins are available on carbon, stainless steel, or copper tube.

- Base tube: Carbon steel, Stainless steel, Copper, Cupron Nickel, Aluminum, Alloy Steel
- Fin: Carbon steel, Stainless steel, Copper, Aluminum
- Rings: Carbon steel, Aluminum, Hot dip galvanizing

Core Tube Material

Material	Grade
Carbon Steel Tubes	A179, A192, SA210 Gr A1/C, A106 Gr B, A333 Gr3 Gr6 Gr8, A334 Gr3 Gr6 Gr8, 09CrCuSb, DIN 17175 St35.8 St45.8, EN 10216 P195 P235 P265, GB/T3087 Gr10 Gr20, GB/T5310 20G 20MnG,
Alloy Steel Tubes	A209 T1 T1a, A213 T2 T5 T9 T11 T12 T22 T91,A335 P2 P5 P9 P11 P12 P22 P91,EN 10216-2 13CrMo4-5 10CrMo9-10 15NiCuMoNb5-6-4
Stainless Steel Tubes	TP304/304L, TP316/TP316L TP310/310S TP347/TP347H
Copper Tubes	UNS12200/UNS14200/UNS70600, CuNi70/30, CuNi 90/10
Titanium Tubes	B338 Gr 2

Please call for a specific size if not listed
We offer you a broad portfolio of materials and can expand our offering at any time to meet your specific needs

regarding thermal conductivity, mechanical properties, or corrosion resistance.

Test instrument & Equipment

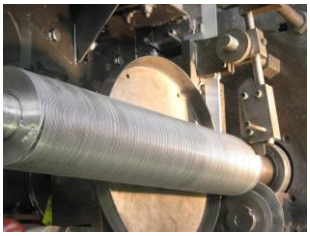
Our factory is equipped with professional technical research and design personnel who can provide product optimization design and services.

Quality is the foundation of an enterprise, the company adopts the most advanced production equipment and the best management and technical personnel in the same industry, constantly improves the product technology, strictly controls every step of the processing process, and strives to meet the fierce market competition with first-class quality products, so as to keep the company at the forefront of the industry forever.

Testing instrument

Hardness tester

Drawing Machine



KL finned tube

L LL KL G production line

Production equipment

Extrusion equipment

Fin tube bending

Well packing for fin tubes

Proper packing of fin tubes is crucial to ensure their safe transportation, storage, and handling, preventing damage to the delicate fins and maintaining their performance and longevity.

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Due to limited space, this manual only introduces some of the finned tube products, and other products are not listed in detail.

We apologize for any inconvenience.

For a more comprehensive understanding of finned tubes, please visit our company's website or contact us for more information.

Please visit the website for more details
WWW.SUNNYSTEEL.COM