

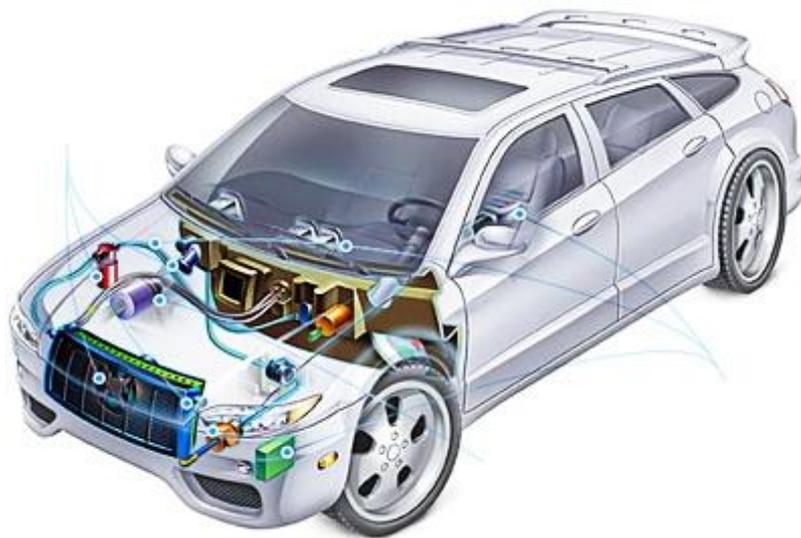
HVAC & HVACR

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What is HVAC?

HVAC (heating, ventilation, and air conditioning) is the technology of indoor and vehicular environmental comfort. Its goal is to provide thermal comfort and acceptable indoor air quality. Refrigeration is sometimes added to the field's abbreviation as HVAC&R or HVACR.

The history of auto A/C dates back to 1933 when a company in New York City first offered installation of air conditioning for cars. However, The Packard Motor Car Company was the first automobile manufacturer to offer an air conditioning unit into its cars, beginning in 1939. Since then, loads of advancements have been made to enhance performance of this inevitable system in modern cars.



The air conditioning system in cars is comprised of a compressor, condenser, expansion valve and evaporator. Refrigerant is compressed in the compressor and turns into a hot gas. In the condenser, this hot gas is cooled to a liquid state and travels to the expansion valve. As the Freon goes through the expansion valve it returns to a low-pressure gas and rapidly cools in the evaporator. A fan blows over the evaporator and cools the air that eventually blows out the vents.



At **Ravimex International** we supply all the materials, components and equipment required for HVAC and HVACR systems; from heat exchanger aluminum materials, pipes and tubes down to components such as compressor, evaporator, condenser, etc. as well as the HVAC module. Our customers are OEMs, OESs, Tier 1s, Tier2s, and after markets of the Middle Eastern countries where we are operating. Depending on customers' requirements, we can supply world-class quality and also after-market quality at competitive prices from reliable suppliers in China, Taiwan, Korea, Turkey and Iran.

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Section 1

R&D Department

Tractors' HVAC

Our R&D department colleagues are ready to help our customers with design, installation as well as operation of HVAC systems of all light and heavy duty vehicles.

We have recently signed a contract with Iran Tractor Manufacturing Company (ITMCO) to equip their newly-developed cabined-tractors with heater and a/c. Two models of ITMCO 399 and ITM 1500 (counterpart of Massey Ferguson 6290) are already equipped in mass quantity. In the meantime, we are preparing to supply aftermarket customers in conjunction with ITMCO in the near future.

We would be happy to share this experience with other OEM and also aftermarket customers.



Heavy Duty Vehicles' HVAC

Just like tractor, we are negotiating with some heavy duty vehicle and equipment manufacturers in agriculture, road construction and mining sectors to supply them with HVAC modules. They produce machines such as combine harvester, bulldozer, wheel loader, excavator, backhoe loader, etc.





Custom OEM

Our experience in HVAC has convinced OEM customers to start cooperation with us. Right now we are working with some car makers on their new models. We are supplying HVAC module for ambulances, pick-ups, mini buses, mini trucks, etc. As for the aftermarket, we are developing HVAC unit for old models of trucks and mini trucks on the roads without a/c system.

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Section 2

Raw Materials



Our Raw Materials

Our products line covers all kinds of alloyed materials and specifications which are widely used in heat exchangers including automobile HVAC system such as radiator, condenser, evaporator, heater, oil cooler, and charge air cooler as well as construction machinery & equipment cooling systems, power station cooling system, micro-channel cooler and all kinds of both commercial and residential air-conditioners as well as heating and cooling systems.

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Finstock

In heat exchangers such as those used in air conditioning systems, the surface area available for heat transfer is a major determinant of efficiency. One of the ways air conditioner manufacturers meet enhanced energy efficiency standards is by using significantly greater quantities of finstock.

Finstock Specifications

Core alloy	3003 / 3003+1.0% Zn / 3003+1.5% Zn
Brazing alloy	4343 (Double Complex) / 4343+Cu (Double Complex)
Waterside alloy
Temper	O / H12 / H14 / H16 / H18
Application	Composite / Non-composite
Coil thickness range (mm)	0.045 - 0.3
Coil ID range (mm)	150, 200, 250, 300, 400, 000
Coil maximum OD (mm)	1800
Coil width range (mm)	10.5 - 1280

Tubestock Specifications

Core alloy	3003
Brazing alloy	4343 (Double Complex)
Waterside alloy	7072 / 3003 MOD + Zn
Temper	H14 / H16 / H24 / H26
Application	Tube
Coil thickness range (mm)	0.18 - 0.8
Coil ID range (mm)	250, 300, 400, 500
Coil maximum OD (mm)	2000
Coil width range (mm)	12 - 1280

Header / Side Plate Specifications

Core alloy	3003 / 3003 + Cu
Brazing alloy	4343 (Single Compound / Double Complex) / 4045
Waterside alloy	7072
Temper	O / H14 / H24
Application	Side / End
Coil thickness range (mm)	0.5 - 4.0
Coil ID range (mm)	300, 400, 500
Coil maximum OD (mm)	1500
Coil width range (mm)	20 - 1280



Drawn/Extruded Tube

Aluminum tube is designated as “extruded tube” or “drawn tube”, while drawn tubes are more popular in many applications. Drawn tube obtains its mechanical properties and dimensions by drawing “extruded tube” through a die. In addition to adding strength, the drawing process provides exceptional dimensional control and a superior surface finish that would not be attainable in an extruded tube of the same alloy and size. Drawing also enhances the bending, flaring and formability of tube.

Aluminum tube is also recognized as **seamless tube** & porthole tube per different extruding process.

Tubes are sold in two configurations: coil and straight lengths.

Flat Tube

Ravimex International can also supply our customers with B-Type tubes, O-Type tubes, Oval-Type tubes and so on in different sizes with below specifications:

Alloy: 3003, 3103

Temper: O, H11, H12, H14, H16, H18, H34, MY2M

Common sizes: 23.5X1.91×0.32, 14.5X1.73×0.32, 16X2×0.32, 16X1.7×0.32, 14.55X2×0.32, 25X1.5×0.32, 18X2×0.32

Application: Radiator



Round Tube

Round tubes are the result of extrusion or HF brazing processes. **Ravimex International** can supply you both types with below specifications:

Alloy: 1100, 1050, 3003, 3103, 5049, 5052, 6061, 6063, 6082 and so on.

Temper: O, H11, H12, H14, H16, H18, H34, MY2M

Common sizes: 8×0.4, 7×0.4, 6.04×0.4, 8×0.5, 8×1, 10×1.25, 15.88×1.2, 9×2, 12×2, 16×2, 10×1.65, 11×1.8, 12×1.75, 14×1.75, 15.88×1.65, 18×2, 19.05×1.65, 12.7×1.2, 9.53×1, 16×1.5, 18×1.5 and so on.

Application: A/C pipeline, radiator, evaporator, heater core and so on.

Shaped Tube

We can also supply tubes in other shapes such as rectangular or square tubes, D-Type tubes, collector pipes which are used in evaporators, condensers, charge air coolers (CAC) and so on.

Clad Tube

Core material alloy: 3003, 3003M

Clad material: 4045, 4343

Temper: H14, H16

Common sizes: 19X1.3, 20X1.12, 20X1.2, 20X1.3, 22X1.3, 22X1.5, 25X1.5, 30X1.55, 32X1.8, etc.

Application: Condenser, Radiator

Micro-Multiport Extrusion Tube

Micro-Multiport Extrusion Tube (MPE Tube) is mainly used for the production of heat exchangers. Due to its high corrosion-resistance & good heat conductivity, MPE tube is particularly well suited for the use in evaporators & condensers with refrigerant R134-A. To meet the market requirement, Ravimex can supply zinc-coated & flux coated MPE tubes, it can be supplied in coils, or fixed length by non-cutting separation method.

Alloy: 1100, 1050, 3003, 3102, etc.

Temper: H112

Common sizes: 18X1.2, 18X2.2 & 15X2 and so on

Application: Condenser, evaporator



Copper Round Tube

*The Level Wound Coil (LWC)

The Level Wound Coil (LWC) Copper Tube is applied to air conditioning, refrigeration as well as heat exchanger fields. It is produced most commonly in soft and light annealed form but can also be ordered in hard drawn temper.

All LWC tubes are normally produced according to ASTM & Coproclima specifications. These specifications are prepared to take account of the requirements of ACR industry.

For heavy coils, we wound LWC copper tubes in "Eye to Sky" (Jumbo) form as per customer request. The tube is cleaned with Nitrogen purging. Moreover to protect the tubes against dust & internal oxidation during transportation or long storing, the tube ends are sealed with plastic caps and delivered with cardboard reels. Coils on reels are stacked on wooden pallets and shrink wrapped.

Specification: O.D: 3/16" to 3/4" (4.76 to 19.05 mm)

Coil Weight : 100- 400 Kg

Application: Applied to the air conditioners, assembly-type air conditioning units, refrigerators, freezers, chests, etc.

Production range for LWC copper tubes:

*Tip: Row line=W.T and Column Line=O.D

	mm	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.63	0.7	0.76	0.8	0.9	1	1.2
mm	inch	0.012	0.014	0.016	0.018	0.020	0.022	0.024	0.025	0.028	0.030	0.031	0.035	0.039	0.047
4.76	3/16			*	*	*	*	*	*	*					
6.35	1/4		*	*	*	*	*	*	*	*	*	*	*		
7.93	5/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9.52	3/8	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12	0.472		*	*	*	*	*	*	*	*	*	*	*	*	
12.7	1/2		*	*	*	*	*	*	*	*	*	*	*	*	
15.87	5/8			*	*	*	*	*	*	*	*	*	*	*	
16	0.63							*	*	*	*	*	*	*	
18	0.708							*	*	*	*	*	*	*	
19.05	3/4							*	*	*	*	*	*	*	*

Note: Other sizes can be made as per customer's requirement according to mutual agreement.

Pancake Copper Tube (PCC)

Pancake Coil Copper Tube (PCC) is mainly applied to air conditioning and refrigeration industry and installation. According the EN standard the Pancake tube has good bending properties for usage in utility supplies such as plumbing installations, gas transport networks, air conditioning systems and refrigerant piping.

Our Pancake tube fulfills the requirements according to the American Society for Testing and Materials Standard Specification B280 and EN12735 and other general norms for refrigeration tubes. These products are supplied in the annealed form. All coils are cleaned and capped to keep contaminants from entering the tube. Then they are individually labeled, shrink wrapped and boxed in cardboard cartons for ease of handling and distribution.

Specification: O.D.: 1/4" to 7/8"(6.35 to 22.22 mm)

Coil Length : 50' to 180' (and/or 15 to 55 meter)

Application: Mainly applied to air conditioning units

Production range for Pancake copper tubes:

*Tip:Row line=W.T and Column Line=O.D

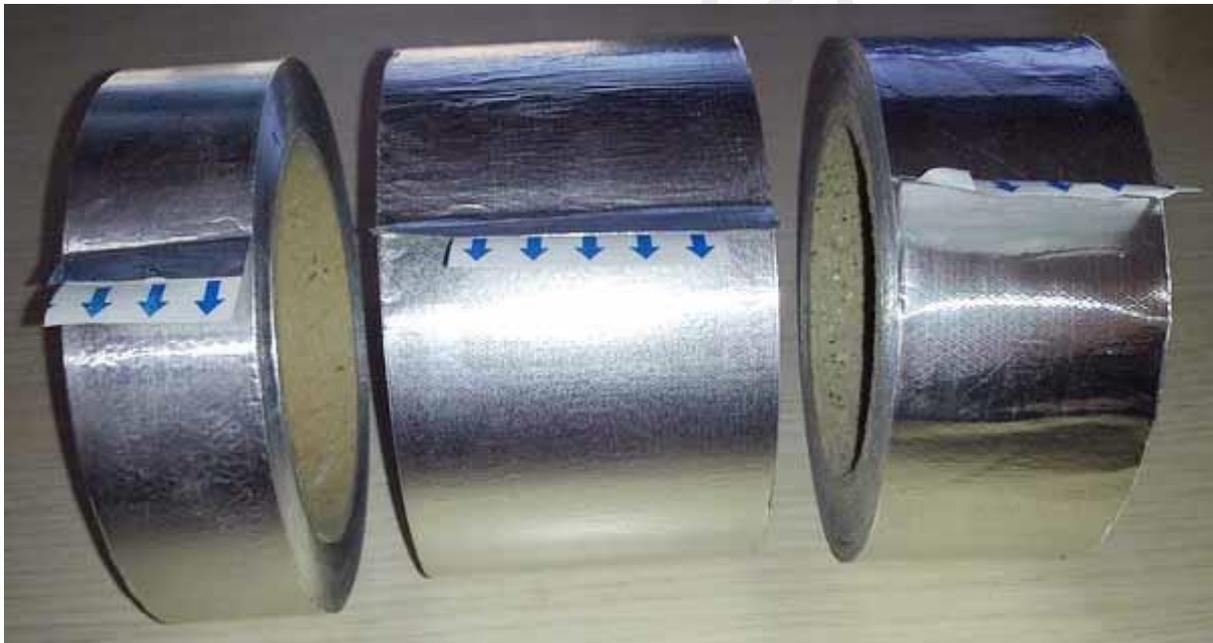
	mm	0.35	0.4	0.45	0.5	0.55	0.6	0.63	0.65	0.7	0.76	0.8	0.81	0.9	1	1.14	1.2
m	inc	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.04
m	h	4	6	8	0	2	4	5	6	8	0	1	2	5	9	5	7
4.76	3/16				*	*	*	*	*	*	*	*					
6.35	1/4	*	*	*	*	*	*	*	*	*	*	*					
7.93	5/16	*	*	*	*	*	*	*	*	*	*	*	*				
9.52	3/8	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
12.7	1/2			*	*	*	*	*	*	*	*	*	*	*	*		
15.8	5/8				*	*	*	*	*	*	*	*	*	*	*	*	*
19.0	3/4									*	*	*	*	*	*	*	*
22.2	7/8											*	*	*	*	*	*

Note: Other sizes can be made as per customer's requirement according to mutual agreement.

Aluminum Tape

Aluminum tape, also known as foil tape, has many uses in the electrical, HVAC and construction industry. It can be used in jobs requiring moisture and chemical resistance, thermal conductivity, flame resistance, heat and light reflectance, and weatherability. There are several different styles of tape available, including acrylic adhesive, lineless, polymer coated, and flame resistant aluminum glass tape.

Foil tape with an acrylic adhesive is used for sealing off vapors in fiberglass duct board, sheet metal ducts and FSK systems. It is ideal for use in HVAC systems, due to its high tack cold weather acrylic adhesive, which helps it to adhere well, even in periods of low temperature and high humidity. It performs at its optimum level in temperatures between -4.4°C and 121.1°C , with a tensile strength of 9.5 kg per 2.54 cm of width.



Section 3

HVAC Components



HVAC Components

As a comprehensive HVAC destination, **Ravimex International** is proud to supply all the components used in auto a/c and engine cooling unit from HVAC module, compressor, radiator, condenser, evaporator, expansion valve, pressure switch, electrical and electronic components down to smaller items such as O-rings.

Our experience of supplying OEM, OES, Tier 1, and aftermarket customers has given us an edge over our competitors. Moreover, Ravimex International can supply these materials not only from China but also from Korea, Taiwan, Turkey and Iran to satisfy any customer with any requirement and preferences.

We are certain you will be satisfied with our products' quality, prices, as well as our services.

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Auto A/C Compressor

For many of us, as long as our car is running well, we may not think about the hundreds of parts working together under the hood to bring us our creature comforts. The air conditioning compressor is one of those parts that typically gets a lot of usage and provides that critical cool air on hot summer days

The a/c compressor compresses Freon into a high pressure (and since temperature and pressure are relative), high temperature gas which is then sent to the condenser for the process of removing the heat.



Auto A/C Hose

An ideal air conditioning system allows the unrestricted flow of refrigerant. But just like a city full of everyday motorists, this can be done only if the roads that lead from one place to another are in good working condition. So before your air conditioning system can dish out excellent performance, you need to make sure that its A/C Hose is more than up for the job. It's a specialized hose designed to effectively transfer both liquid and gas.



Auto A/C Expansion valve

When liquid refrigerant is forced through a restricted opening, it changes from a liquid to a gas. This change of state causes the refrigerant to become cold, and as it passes through the system, it absorbs heat from the passenger compartment. The vehicle's air-conditioning relies on this change of state to operate, and the expansion valve provides the restriction used to control the volume and pressure flowing through the system.



Auto A/C V Belt

One of the components that have gone through little or no change at all since the early years of the automobile is the belt. Though the material might have been enhanced to provide better performance, it still carries the same basic function of powering your engine's components. One area where these belts prove useful is in driving your A/C's compressor. So to make sure it does a good job of doing this, it needs to be paired with an A/C Belt Tensioner. This device is what constantly keeps the A/C belt tight and firm. By doing this, you're assured that it's able to dish out better performance, prevent belt slippage, and avoid quick deterioration.

Types of a/c belt:

- 1- Serpentine belt
- 2- Cogged V-Belt



Accumulators and Receiver-Driers

While often overlooked in regular vehicle service, accumulators and receiver-driers play an important role in A/C operation. These components manage the flow of liquid and vapor refrigerant through the system, assuring maximum output and smooth, surge-free operation. Accumulators and receiver-driers also contain powerful desiccant packages to isolate harmful moisture from the system, protecting the internal components from corrosion, which can wear systems prematurely from the inside out and create costly leaks. When major A/C service is performed, replacement of the accumulator or receiver-drier is often recommended by leading service authorities.



Auto A/C Desiccants Bag

In order to optimize the operation of your vehicle's precious air-conditioning system, the accumulator needs to have a reliable A/C Desiccant Bag. Desiccants are substances that dry off the refrigerant before it cycles back into your system, allowing it to exchange heat more efficiently. With a desiccant in your vehicle's A/C, you'll definitely notice a difference in its performance. You can avail of a variety of A/C Desiccant Bag options for your vehicle's condenser or filter drier.



Auto A/C Relay

An electrical relay is sort of a magical device – it takes a small electrical signal and uses it to manage a much more powerful current, permitting electrical systems to be both lighter and more dependable at the same time. The air conditioner (A/C) cutout relay is designed to shut off the air conditioner compressor, by disengaging the A/C compressor clutch. Normally, when the air conditioner is active, the compressor uses power from a fan belt to convert refrigerant from a gas to a liquid. This takes a great deal of power. If the air conditioning compressor clutch is disengaged, the pulley will spin but the compressor won't operate, reducing drag on the engine.



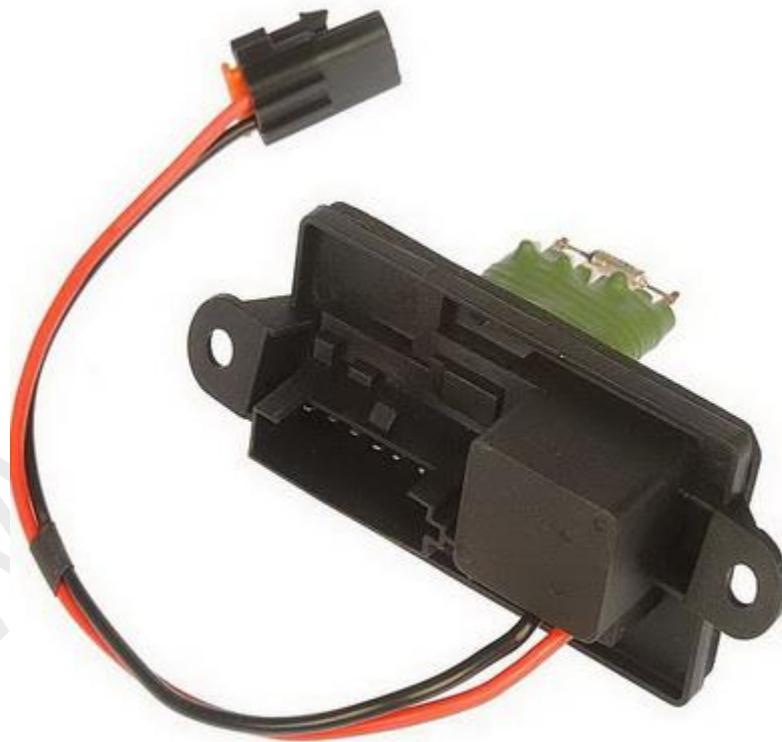
Auto A/C Sensor

Superior pressure sensing is required for highly efficient A/C loop systems that enable reduced fuel consumption and improved emissions. The control of the air-conditioning ought to require only the slightest attention from the driver. Effective air-conditioning helps the driver keep a cool head in the most tricky situations and also minimizes the stress on the passengers. Longer trips tend to be hard on both drivers and passengers, but a well-functioning air-conditioning system relieves some of the discomfort.



Auto A/C Resistor

The blower motor resistor, also commonly referred to as an A/C blower motor resistor or a heater blower motor resistor, is an important component to your vehicle's HVAC (heating, ventilation, air conditioning) system. While a blower motor is what actually forces the hot or cold air through ducting and your car's interior vents into the cabin, the resistor is what regulates the speed of the blower fan by reducing voltage going to the fan. It allows you to vary the settings of the blower motor so that you can lessen the amount of air that comes into the cabin, as opposed to only being able to have it blasted at you. The blower motor resistor works between a vehicle's heater and A/C controls and the blower motor and is typically attached under the dash to the heater ducting near the blower motor to help keep it cool while in use.



Aluminum Ferrule/Socket

The aluminum ferrule/Socket is used for automotive air conditioning pipe connecting or other purposes. We have exported this product to many customers in the world.

The alloy could be AA3003, AA1050, AA5052, AA6061 or any other specified alloy by customers. Typical OD is 15-34.5mm and length 25, 32, 38, 40.5mm. The surface could be as manufactured, oxidized or other required treatment. We also supply aluminum muffler that reduces noise when air conditioner is operating.



Section 4

Final Products

Heat Exchangers

A heat exchanger is a device designed to efficiently transfer or “exchange” heat from one matter to another. When a fluid is used to transfer heat, the fluid could be a liquid, such as water or oil, or could be moving air. The most well-known type of heat exchanger is a car radiator. In a radiator, a solution of water and ethylene glycol, also known as antifreeze, transfers heat from the engine to the radiator and then from the radiator to the ambient air flowing through it. This process helps to keep a car’s engine from overheating.

There are various types of heat exchangers:

- 1- Air-to-liquid cooling
- 2- Liquid-to-air cooling
- 3- Liquid-to-liquid cooling
- 4- Air-to-air cooling



Auto A/C Evaporator

An evaporator is used in an air-conditioning system to allow a compressed cooling chemical. Evaporator performance is essential for proper air-conditioning performance.

Available Evaporator Types:

- 1- Multitank Super-slim (MS)
- 2- Parallel Flow single-tank
- 3- Laminate
- 4- Serpentine
- 5- Fin & Tube (mostly used in refrigerators (HVACR))



Auto A/C Condenser

The condenser functions as a heat exchanger. It releases heat into the air passing through its fins. The refrigerant system releases heat energy with a condenser and receives heat energy with the evaporator. The condenser receives high temperature high pressure vapor from the compressor and converts it to high pressure liquid through the process of condensation. It is located in front of the radiator and constructed of tubes surrounded by cooling fins. As air passes through the tubes and fins, the heat in the refrigerant is passed through the condenser fins and into the atmosphere. The condenser releases the heat absorbed from the cabin by the refrigerant in the evaporator. The purpose of the condenser is to release heat and change the state of the refrigerant from vapor to liquid.

Types of available A/C condensers:

- 1- Parallel Flow Condenser (PFC)
- 2- Serpentine Condenser
- 3- Fin & Tube (mostly used in residential and commercial heat exchangers)



Auto A/C Heater

This device gives you the ability to dictate what comes out of your vehicle's A/C and heater system. With this device in place, you can adjust the temperature inside your vehicle to help counter the current temperature outside your ride. This allows you and your passengers to stay comfortable regardless of the weather outside .



Auto A/C Charge Air Cooler (CAC)

In turbocharged engine applications, the air used for the engine combustion is compressed in order to increase its density. Ultimately, this makes the combustion more efficient resulting in better engine performance and lower exhaust emissions.



Passenger Car Aluminum Radiators

A radiator is a heat exchanger that uses coolant to dissipate excess heat from the engine. Radiator performance is essential for proper engine cooling and function. Our radiator configurations, tanks, fin pitch, core dimensions and materials meet OE manufacturer's rigid standards.

Radiator types:

Plastic tank with aluminum core

Plastic tank with copper core

Cross-flow and down-flow configurations



Illustration Details:

1- Fin Pitch – Superior fin waves provide a higher heat transfer.

2- Flow Configuration – Available in cross-flow and down-flow configurations.

3- Aluminum or Copper Core – Thin-tube construction assures maximum cooling efficiency.



Fin Pitch 1
Flow Configuration 2
Aluminum or Copper Core 3

Copper & Brass Radiators

Despite the fact that aluminum radiators are commonplace these days and more cars are produced with them due to advantages such as lighter weight, more corrosion resistance, cheapness, etc., however copper & brass radiators are still used in older models of cars and are especially recommended for heavy duty vehicles such as trucks, buses, tractors and other agricultural and road-making vehicles.

Ravimex International can supply you with a wide range of models of copper & brass radiators with OEM and A.M quality at competitive prices.



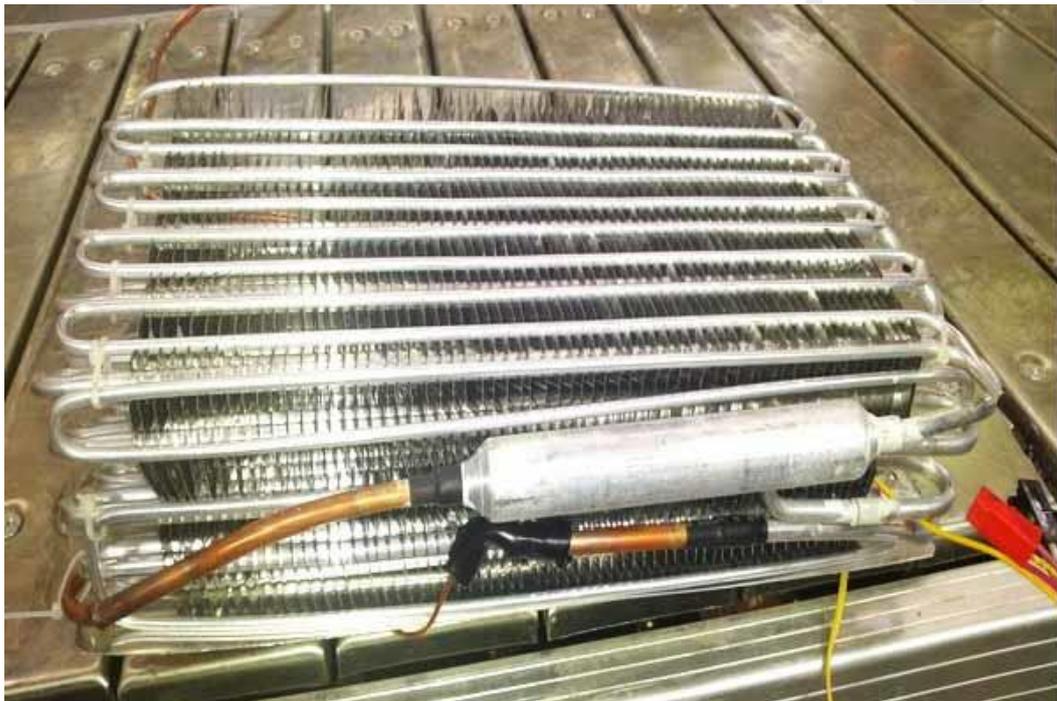
Refrigerator Compressor

The compressors are one of the most important parts of the refrigeration cycle. The compressor compresses the refrigerant, which flows to the condenser, where it gets cooled. It then moves to the expansion valve, and the evaporator and it is finally sucked by the compressor again. For the proper functioning of the refrigeration cycle, the refrigerant must be compressed to the pressure corresponding to the saturation temperature higher than the temperature of the naturally available air or water. It is the crucial function that is performed by the compressor. Compression of the refrigerant to the suitable pressure ensures its proper condensation and circulation throughout the cycle. The capacity of the refrigeration or air conditioning depends entirely on the capacity of the compressor.



Refrigerator Evaporator

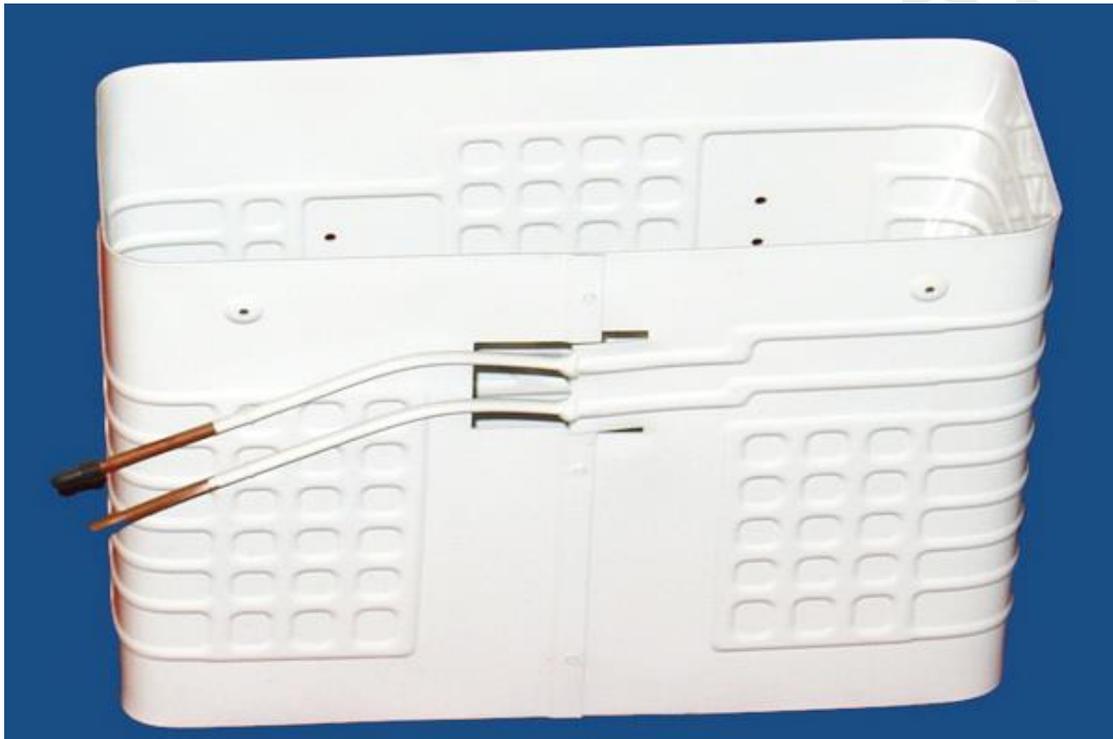
It is in the evaporators where the actual cooling effect takes place in the refrigeration and the air conditioning systems. The evaporators are heat exchanger surfaces that transfer the heat from the substance to be cooled to the refrigerant, thus removing the heat from the substance. In the domestic refrigerators the evaporators are commonly known as the freezers since the ice is made in these compartments. Nowadays, the most common evaporator used in refrigerators and freezers is fin & tube type.



Roll Bond Evaporator

A roll bond evaporator is roll-formed after being designed/printed on aluminum plates as per customers' requirements or drawings.

It has been widely used as evaporator in a refrigerator or freezer, which space for evaporator installation is normally very compact and in hence high heat transfer coefficient and compact design is essential.



Section 5

Machinery & Equipment

Brazing Furnace

A brazing furnace is essential for heat exchanger production and different furnace or automatic brazing machine could be employed for production of different heat exchangers. A SS/aluminum vacuum brazing furnace with vertical type or horizontal type is normally used in case of short order, big dimension and critical demand on surface while controlled atmosphere brazing furnace (CAB) provides high efficiency. Our manufacturer is of the most experienced in China.

Technical Features of Brazing Furnace:

- High temperature uniformity
- Automatic PLC control
- Flexible on process/module
- Customized



Technical Features of Automatic Heat Exchanger Brazing Machine:

- PLC control, Auto-brazing
- Auto-transport coil to brazing area after confirmation of loading
- Moving device auto-running
- Flexible
- Adjustable height of fixture
- Adjustable brazing gap distance
- The flow of O₂ and fuel gas adjustable
- Safe to operate
- Controlled by pilot pneumatic valves
- Auto-alarm when gas over pressure
- Safe door auto-lock device preventing accident
- Flash-back arrestor in gas line, ensure system safty
- Auto-switch of strong and weak fire, prevent the danger from disoperation

Tube Mill

A tube mill is a machine which changes the shape of an aluminum coil with width usually ranging from 0.2 to 0.6 mm to tube forms such as B-Type, Oval-Type, Flat-Type, etc. using high frequency welding. We can supply customized tube mills as per customer's requirements from our Korean, Taiwanese and Chinese suppliers.



Fin Mill Machine

There are different types of fin for different automotive heat exchangers, we provide customized fin machine in either roller type or pressing type. Roller type fin machine is mainly used for radiator, a/c and heater core while pressing type mainly is used for oil cooler and intercooler (charge air cooler).



High Speed Fin Mill

Material : Aluminum & Copper

Material Thickness : 0.06~0.16mm

Fin Width Range : 14~160mm

Fin Height Range : 4.3~22mm

Fin Pitch Range : 2.0~6.0mm

Fin Density Range : 35~100FPDM

Fin Length : Variable

Cutting Rate : 130Cuts/Min Max

Roll Stand : Tow Coils (600Kg/Coil)

Material Outside Diameter : Up to 1,800mm

Material Inside Diameter : Under 150~350mm

Low Speed Fin Mill

Material : Aluminum & Copper

Material Thickness : 0.06~0.12mm

Fin Width Range : 12~80mm

Fin Height Range : 4.5~16mm

Fin Pitch Range : 2.2~5.0mm

Fin Density Range : 40~90FPDM

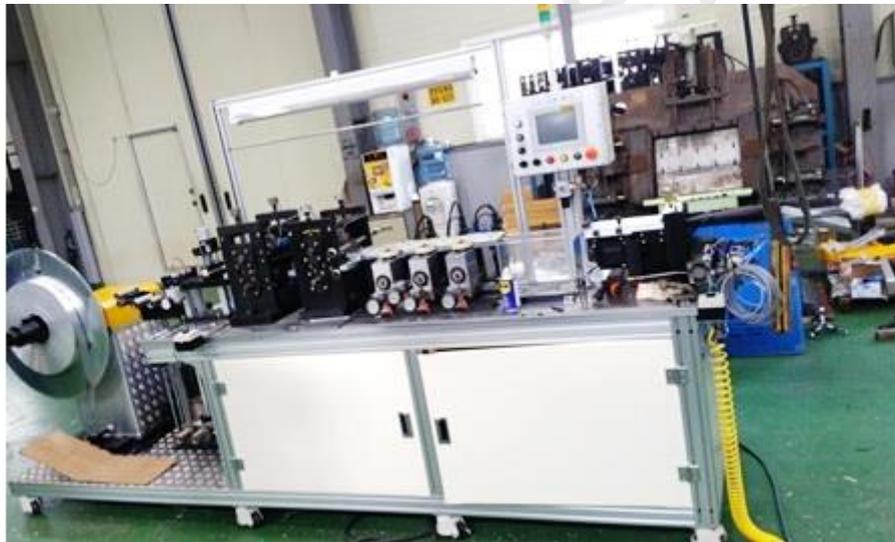
Fin Length: Variable

Cutting Rate: 50Cuts/Min

Max Rell Stand: Coils (300Kg/Coil)

Material Outside Diameter: Up to 1,200mm

Material Inside Diameter: Under 150~350mm



Radiator Core Builder

Capacity : 40 cores/hour

Model change time : 30minutes

Header to Header : 400mm~700mm

Support to Support : 400mm~700mm Fin Width : 48mm Tube Width : 22mm

Tube Rows : 2Row only

Tube Pitch : 1Pitch only



Large-Sized Radiator Core Builder

Capacity : 30 cores/hour

Model change time : 30minutes

Header to Header : 400mm~900mm

Support to Support : 400mm~900mm Fin Width : 58mm Tube Width : 27mm

Tube Rows : 2Row only

Tube Pitch : 1Pitch only



Helium Leak Detector

A Helium Leak Detector (Helium test machine) is designed for test on evaporator, condenser and their connecting pipes so as to ensure that the leakage rate of all products can meet a certain standard.

Designed for different applications, the test method could be either vacuum box type or hose assembly clam shell type. Most machines for automotive heat exchanger application are vacuum box type. This design permits to test several work pieces in a same box, or in case of changing models frequently.

Helium leakage test machine is widely equipped in automotive industry for testing on piping, air-conditioning system, compressor, valve, wheel and oil cooler etc.



Main Technical Parameters

-- No. of vacuum box:	1-4 pcs
-- Work piece test in each box:	1-4 pcs
-- Volume of vacuum box:	5-600 L
-- Test pressure:	0-4 MPa
-- Leakage rate alerted:	5 g/a(adjustable on customer request)
-- Working frequency:	Customized

Features:

- Fixtures match to work pieces, system identifies work piece by the fixture
- Passed work piece label auto-printed, test data auto-stored
- 30 groups programs fulfill various types test requirements
- Highly automatic operation
- High test precision and efficiency

Auto Feeding Machine

The numeric auto feeding machine is designed to cooperate a normal punching machine, through which the normal punching would be upgraded into an automatic numeric punching machine.

This could enable:

- Feed with a whole plate
- Automatic material arrangement
- Automatic feeding
- Automatic punching
- Utilize the raw material to the maximum
- Ensure the safety of operators

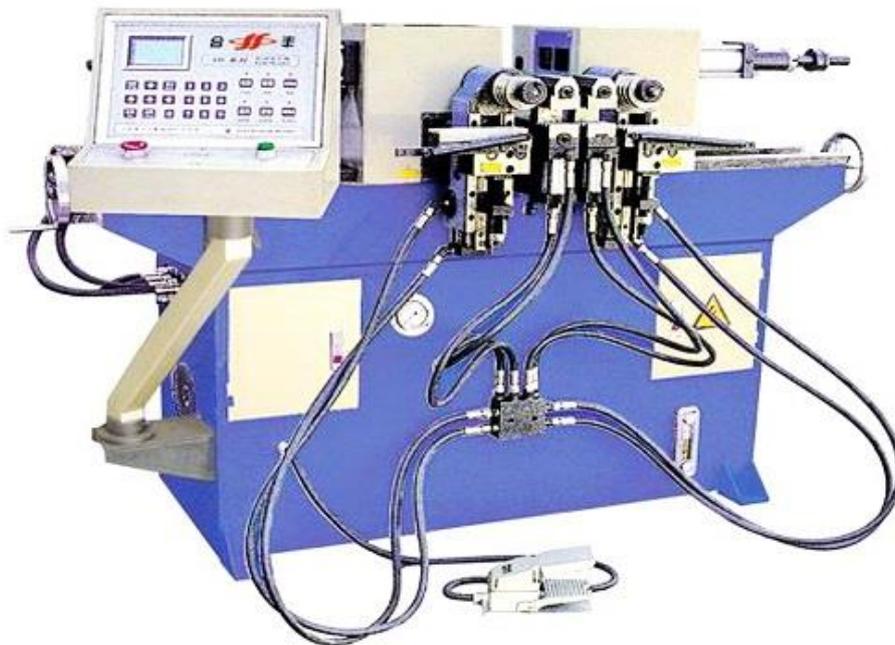
Under condition of 1mm plate and 200mm pace, the automatic feeding accuracy can be about 0.15mm!

The automatic feeding machine could be delivered either alone to upgrade your existing punching machine or together with our punching machine.

Tube Bending Machine

Our tube bending machines are designed for 2 applications:

1. For serpentine heat exchanger flat tube bending with different bending radius and max bending width 100 mm, manually operated or automatically operated.
 2. For heat exchanger connecting round pipe automatically bending.
- We also supply crimp machine, flaring machine, ending machine.



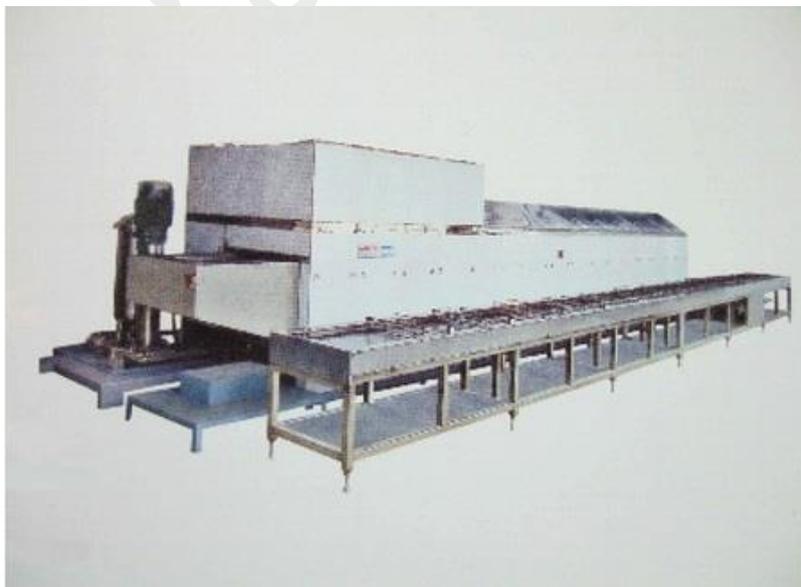
Ultrasonic Cleaning Machine

In order to ensure a good brazing effect, most punched parts of automotive heat exchangers need be cleaned to remove the residual oil and grease by ultrasonic process with a special cleaning detergent used. It should be pointed out that the ultrasonic process and cleaning detergent we use differ from the conventional ones.

The ultrasonic cleaning process and detergent we use have been widely used by rocket making industry, nuclear power stations, auto companies, optics and semiconductor companies, refrigerator companies, electro-mechanical companies, wire drawing and part punching industries.

Advantages of our cleaning process and detergent:

- Fully automatic cleaning and high efficiency
- Stable and continuous caterpillar transmission
- Cleaning under room temperature, which greatly saves energy
- Water-soluble detergent, easily handling and environment friendly
- Fully automotive multiple security devices
- * Tailored products upon request



Other Related Machinery

Besides listed machines and equipment, Ravimex International can also supply all the machinery and equipment used in the production cycle of HVAC and engine cooling units from reliable suppliers at competitive prices.

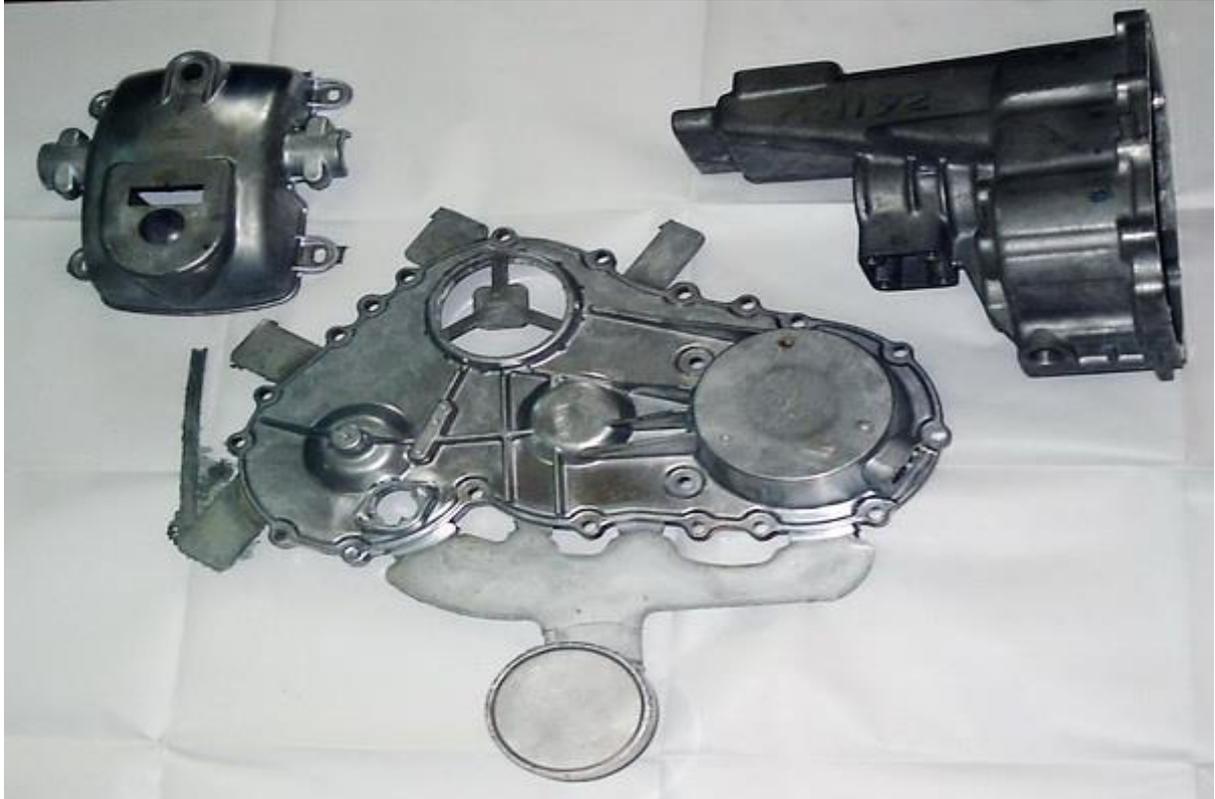
Some of these machines are as below:

- Laminate Evaporator Auto Assembly Machine
- PF Condenser Core Assembly Line
- Tube Cutting Machine
- Tube Rolling Machine
- Air Leak Tester
- Fin Forming Machine
- Hose Crimping Machine
- HVAC Tester
- Clenching Tool & Machine
- Cooling Module Ass'y and Turn Table Ass'y,
- EGR Cooler Line (including EGR Cooler Air Leak Machine, Fin & Foil Insertion Machine, Auto Paste & Gas Tank Ass'y Machine, Tube Expanding Machine)
- EGR Cooler Assembly Line (including Geometrical & Thread Controller Machine, Coolant Pipe Caulking Machine)
- Oil Cooler Air Leak Machine
- Wave Fin Roll & Stand
- Offset Fin Roll & Stand
- ATF Warmer Auto Assembly Line
- Oil Cooler Flux Dipping Machine
- Oil Cooler Heat Dryer
- Free Flow Conveyor
- Inter Cooler Core Builder



Molding

All the objects around us are shaped by using molds. HVAC and HVACR are not exceptions at all. Our mold manufacturer is one of the best in this field, especially for plastic items used in HVAC and home appliances.



Section 6

Other Related Products

Punch Oil

- Product name: Punch – 4300S
- General Feature: Aluminum Press Oil for Heat-Exchanger
- Harm: Not Toxic and Harmful Base Oil
- Direct Food: Allow under FDA 21CFR 172.882, 172.884
- Indirect Food: Allow under FDA 21CFR 178.3530, 178.3650

Physical and Chemical Properties

- Appearance: Clean
- Odor: Light
- Solubility: Insoluble in water.
- Specific Gravity (15°C/4%): 0.7615
- PH: None
- Reactivity to Water: None
- Corrosion: None
- Flash Point (°C): 54
- Viscosity (40°C, cSt): 1.3~1.6



Flux Powder

Product Name: Al-Flux (Aluminum Potassium Fluoride)

Recommended Uses and Restrictions of Use

Recommended Uses: Flux for aluminum air-conditioning systems, Restrictions of Use: None

General Characteristics: White powder type

Composition and Information of Ingredients

Chemical Name	CAS No.	Content (%)
Aluminum Potassium Fluoride	60304-36-1	100

a. Appearance

– Physical state: Solid

– Color: White

b. Odor: Odorless

c. pH (20% solution, 25°C): 5.5 – 7

d. Melting Point/Freezing Point: 560 – 578 °C

e. Boiling Point: Not available

f. Flammability (solid, gas): Not available

g. Solubility: 4.5 g/l (20°C)

h. Vapor Pressure: Not available

i. Decomposition Temperature: Not available

j. Bulk density: 500 ~ 750 g/L

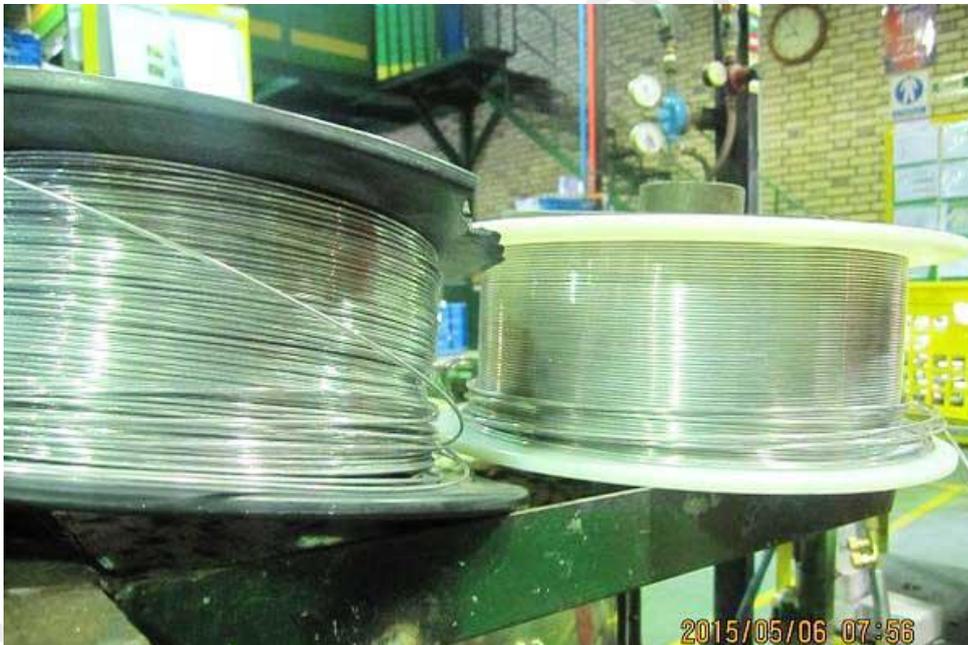
k. Granulometry: 6 ~ 12 μm

Aluminum Brazing Materials

Aluminum brazing materials are used for automotive heat exchanging and household air-conditioning manufacturing process. The products include Al flux-cored wire, paste, non-corrosive brazing flux and brazing rings etc.

Aluminum Flux-cored Brazing Wire/Rod

The Al Flux-cored brazing wire is consisted of Al-Si alloy and non-corrosive flux in the form of rod and preformed ring with advantage of convenient application and fast melting. They are widely used for the brazing for radiator, condenser and other thin-wall parts. The normal diameters include 2.0, 2.2 and 2.4mm etc. which could be used both flame brazing and CAB brazing.



Aluminum Brazing Paste

The brazing paste consists of AA4047 powder, non-corrosive flux and adhesives and used for secondary brazing for radiator, condenser and evaporator and CAB brazing of condenser accessories.

PA66 (for Radiator Tank)

Ravimex International can supply you with Polyamide 66 which is used in aluminum & plastic radiator tanks.



Refrigerants

A refrigerant is a substance or mixture, usually a fluid, used in a heat pump and refrigeration cycle. In most cycles it undergoes phase transitions from a liquid to a gas and back again. Many working fluids have been used for such purposes. Fluorocarbons, especially chlorofluorocarbons, became commonplace in the 20th century. Nowadays R134a is the most common refrigerant used in auto a/c systems as well as refrigerator compressors. Ravimex International can supply you with pure refrigerants used in HVAC and refrigeration systems such as R134A, R22, R407C, R410A, R404A, R406A, R152A, R12, R142B, R143A, R32, R125 from our world-class supplier in China.



Thanks For Visiting us

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