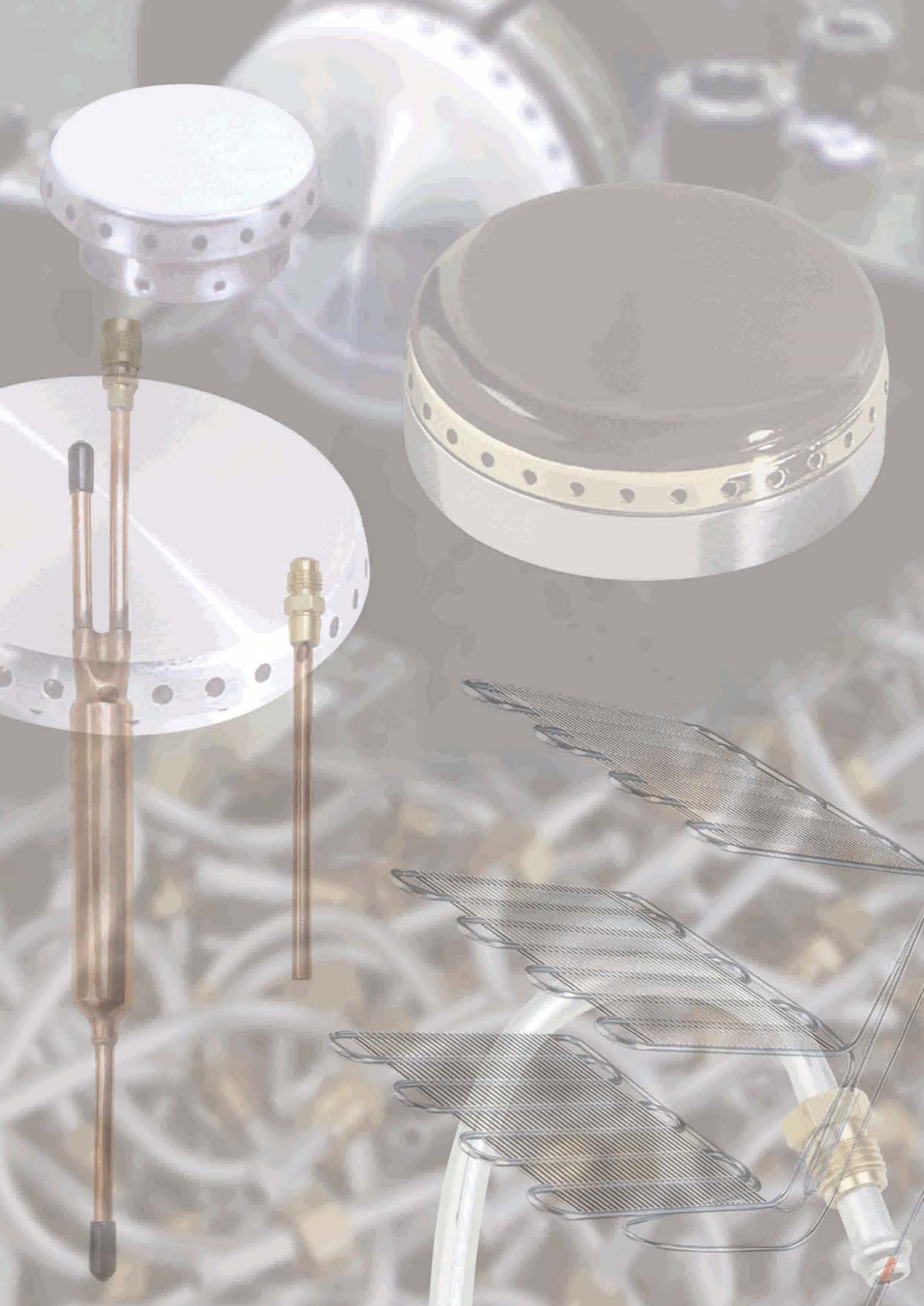




**KONVEYÖR**





# KONVEYÖR

KONVEYOR was founded in 1979 as a manufacturer of chain-forged overhead conveyor systems. In 1981, the company began manufacturing aluminium-forged burner caps for gas cookers for a leading appliance manufacturer. In the 1980's the Turkish appliance industry grew significantly and KONVEYOR transformed gradually from a supplier-subcontractor to a supplier of the appliance industry. With the shift of emphasis, we mounted our last conveyor system in 1991.

In 1992, KONVEYOR established a small plant in Eskisehir, to supply the suction tube assemblies of the biggest refrigerator plant in Turkey on JIT basis.

In 1996, we moved our Eskisehir factory to its own 3000 m<sup>2</sup> building in Eskisehir's Industrial District and in 1997 we transferred our Istanbul plant to our own 5000 m<sup>2</sup> factory building in Tuzla Industrial District on the Asian side of Istanbul.

Towards the end of 1998, KONVEYOR gained DIN ISO 9002 Certification from RWTV, Germany, association, and has been holding the certificate ever since.

In 1999, the Eskisehir plant was enlarged to 6000 m<sup>2</sup> and the investment for manufacturing the WOT evaporators was started. In the same year, we invested to produce fabricated copper tubes and assemblies for HOME AIR CONDITIONER units in Tuzla (Istanbul) plant.

At the end of 2000, the WOT investment in Eskisehir was completed successfully. With the success achieved, and with the push of customers, the WOT capacity was doubled each and every year up to 2004. Hence, the Eskisehir plant has reached to 12 000 m<sup>2</sup> production area.

In 2001, KONMAK was established by KONVEYOR in a separate 1600 m<sup>2</sup> building near to the Tuzla plant. The idea was to handle the machine designing & building and R&D works under a separate organization. Towards the end of 2001, we started manufacturing the Cu CAPILLARY Tubes under KONMAK.

In 2002, the 2nd KONVEYOR subsidiary MAKON was established in the Manisa's industrial district (3000 m<sup>2</sup> plant) in order to supply the second biggest appliance player of the country in site. In 2005 the factory building was enlarged to 5000 m<sup>2</sup>.

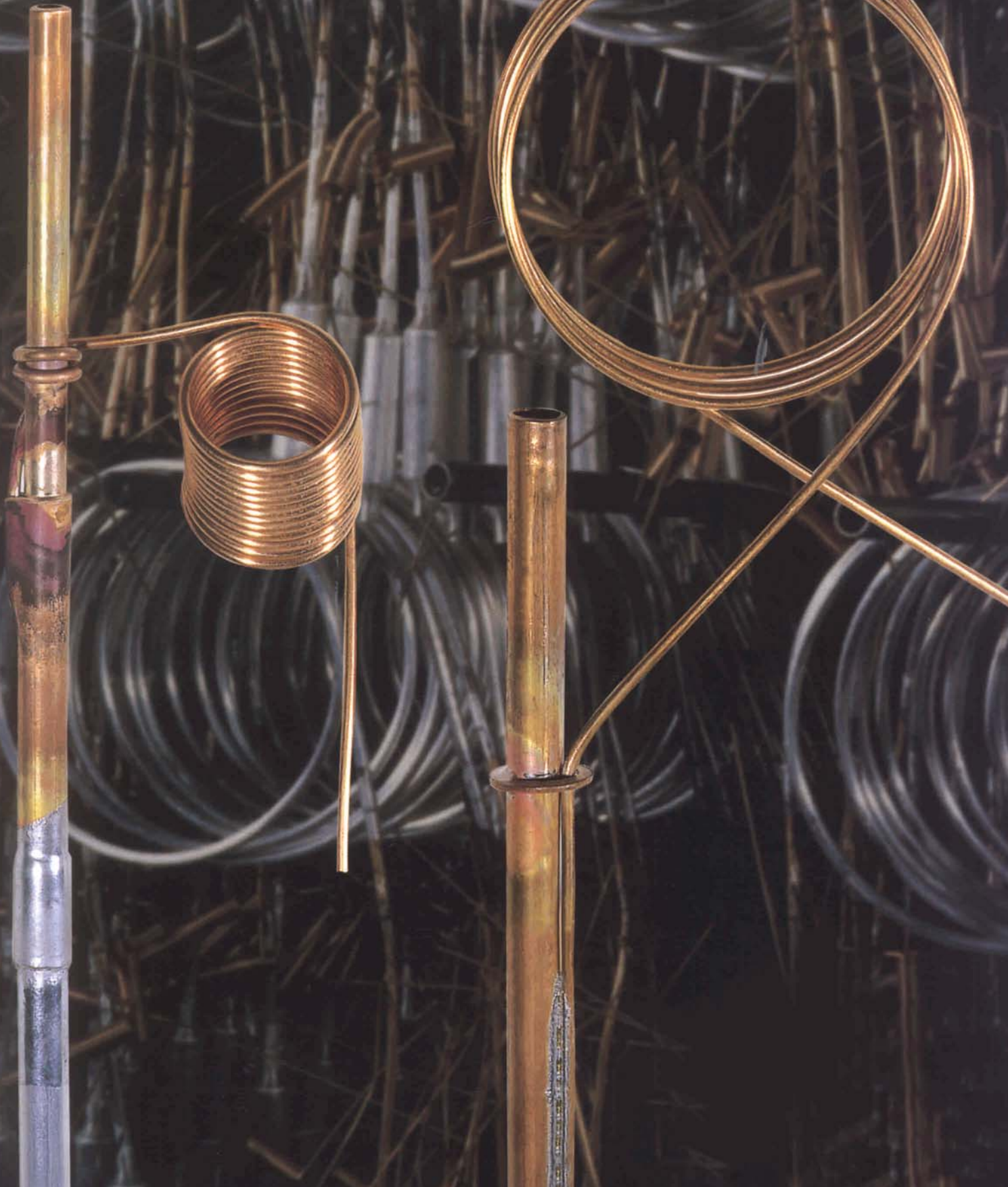
To handle the growing export potential, we established the 3rd subsidiary in the Free Tax Zone Area of Tuzla (Istanbul) in 2005. The separate company there is KONVEYOR LTD (KONVEX) and the building has 14 500 m<sup>2</sup> of closed area with the expansion potential of up to 26 000 m<sup>2</sup> for future needs.

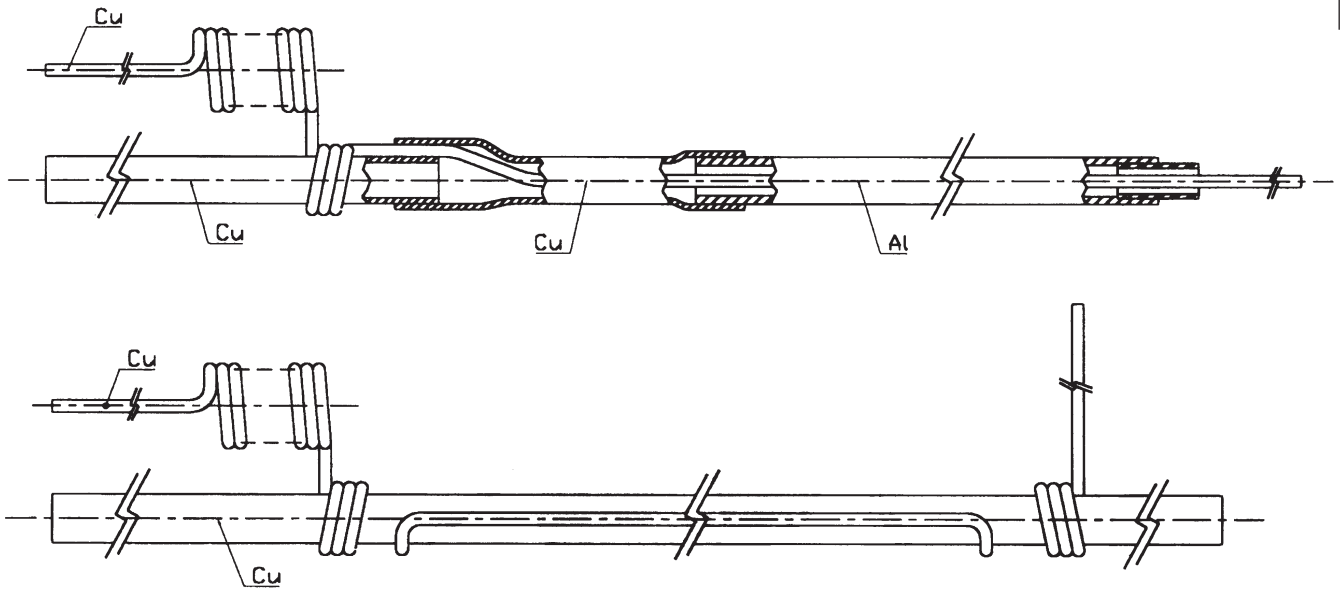
KONVEYOR invested for manufacturing the NF (No Frost) Evaporators in 2005 and for the extrusion of refrigeration grade ALUMINIUM TUBES in 2006 in the KONVEX building. During the next a couple of years, KONVEYOR became one of the major NF suppliers in Europe. We also invested for the HEATING ELEMENTS of NF evaporators in 2009.

Including the rented 4000 m<sup>2</sup> building in Eskisehir (2007), KONVEYOR has 6 factories (46 000 m<sup>2</sup>) and over 1300 employee in total as of 2011.

Please contact us for further information by dialling direct or emailing us at [konveyor@konveyor.com](mailto:konveyor@konveyor.com). One can also get updated information about KONVEYOR by visiting the web site [www.konveyor.com](http://www.konveyor.com).

# *Heat Exchangers*





In the refrigeration cycle, for higher efficiency, the liquid refrigerant condensed in the condenser and flowing in the capillary tube towards the evaporator should be cooled, while the vapour refrigerant sucked by the compressor from the evaporator through the suction tube should be heated up from saturated to superheated condition. Hence, the two tubes are brought together to achieve both of these objectives. This twin tube system is called the "heat exchanger" or "suction tube assembly" of the refrigeration cycle.

To help the heat exchange, the two tubes can be soldered together as in the tube-on-tube copper heat exchangers, or the capillary tube can be passed through the suction tube as in the Al-Cu mono-tube heat exchangers.

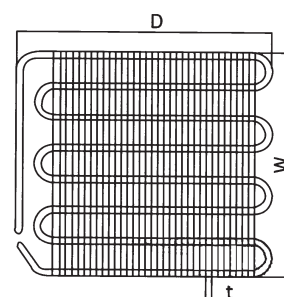
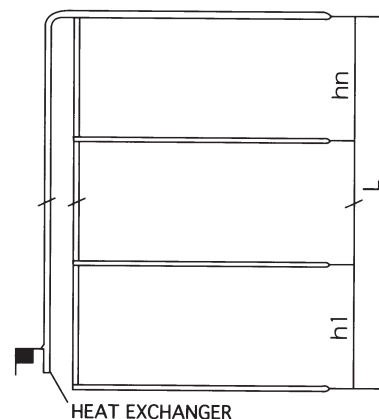
KONVEYOR manufactures large quantities of both types as well as special ones for freezers like combi, frost-free, or home air conditioner.

Copper, capillary, and (partially) aluminium tubes are cut to lengths and brought together by using special machines.

Aluminium-copper connections of the mono-tube suction tubes may be made by different methods like, Zn-Al alloy brazing, ultrasonic soldering, or eutectic welding.

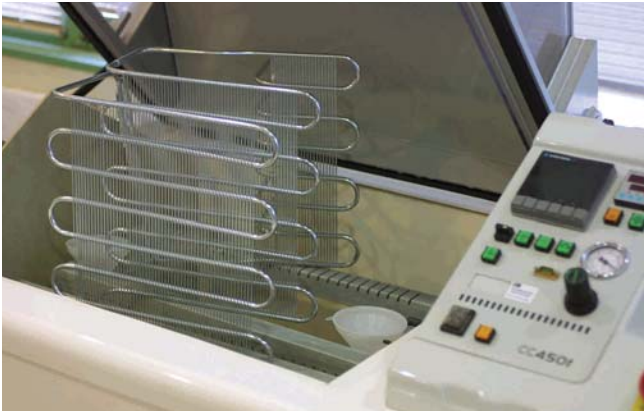
- All heat exchangers are tested against leak by special instruments or apparatus including Helium Snuffers.
- All capillary tubes of every heat exchanger are tested by flow meters.
- All heat exchangers meet the internal cleanliness criteria defined by the related standards.
- All open ends are capped with plastic caps; they are packed on Euro pallets for long distance deliveries.

The Aluminium and Capillary tubes used in the heat exchangers are manufactured by KONVEYOR internally.



# *Freezer Shelves*



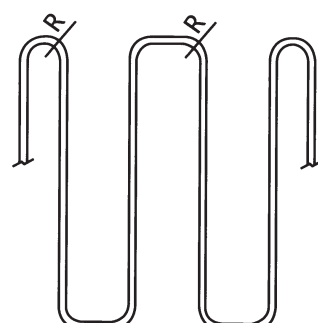
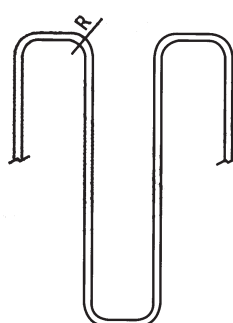
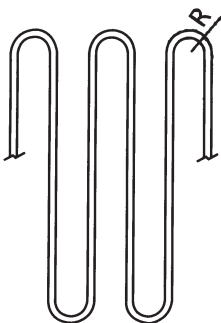


A "Freezer Shelves" system is a multi-functional product combining both "shelves" and the "evaporator" of a refrigerator within itself. As these are multi functional features and also are made out of relatively cheaper materials like steel tube and wire, they are less expensive compared to the traditional alternatives and hence they are considerably used in the application. The only disadvantage, however, could be that the shelves in this application are fixed rather than the removable ones in the alternatives.

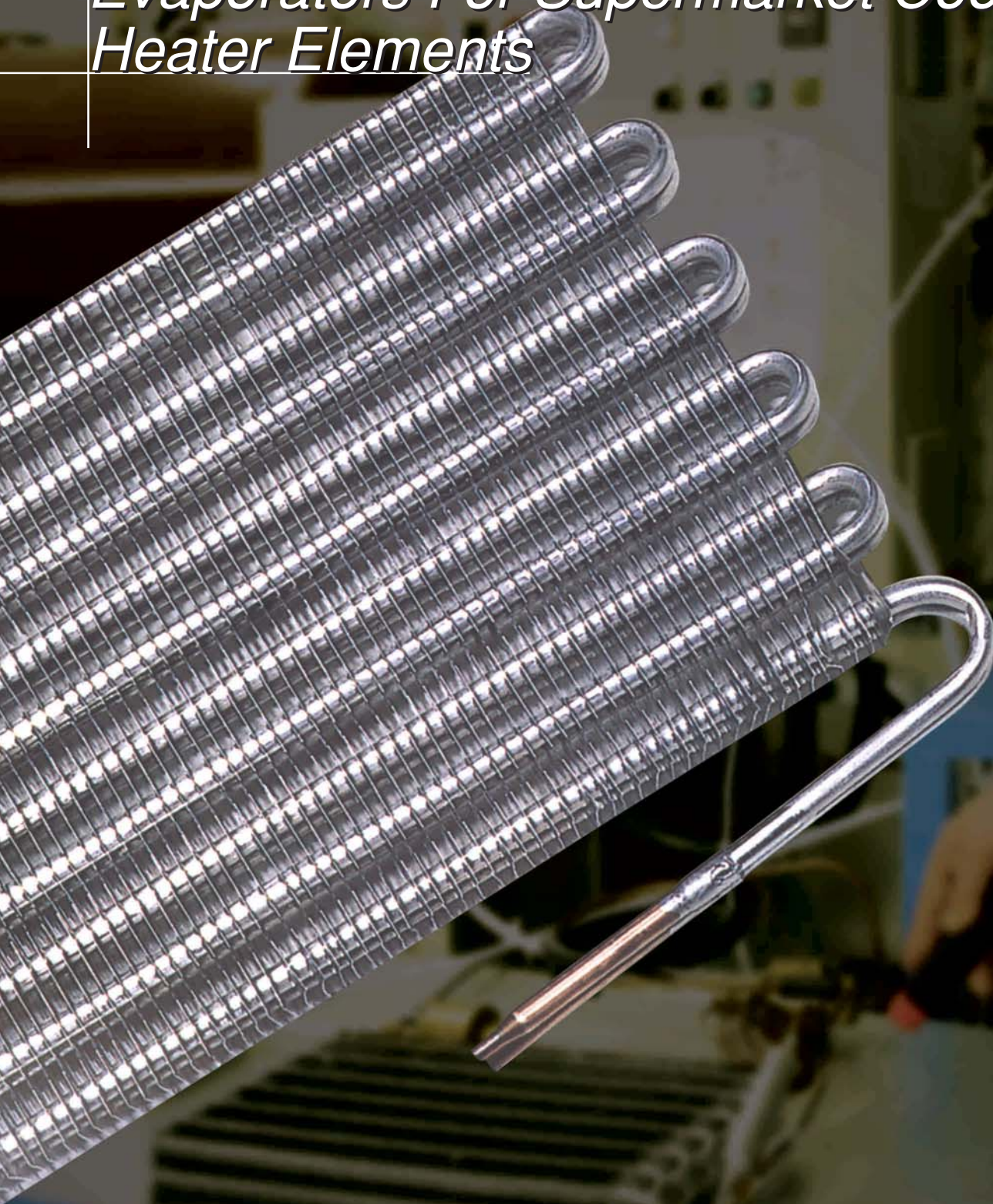
In the production at KONVEYOR, 8x0.70 mm steel tube, 1.5 mm steel wires are used and the production steps are as follows:

- Cutting the lengths (for the wire and the tube), serpentine forming, resistance welding (for the wires to the serpentine) and secondary bending operations are performed by automatic machines.
- The individual shelves and the heat exchanger are brought and hard brazed together to form 2 to 8 shelves units.
- The manufactured units are tested against leaks by Helium Snuffers (1st step test).
- The tested units are zinc plated to 10-12 microns in the fully automatic zinc plating lines.
- After the zinc plating, the 2nd step leak test is applied by Helium Chamber testing systems. The TWO STEP testing principle is unique to KONVEYOR, in order to reach "absolute zero" level leak defects at the assembly lines.
- As the last operation, the Zinc plated units are coated in a protective and food friendly clear lacquer coating (10-12 microns).
- The finished products are packed on euro pallets and shipped to customers.

The design, i.e. number of shelves per unit, shelf dimensions, form of serpentine and wire spacing could be adjusted as per customers' requirements.

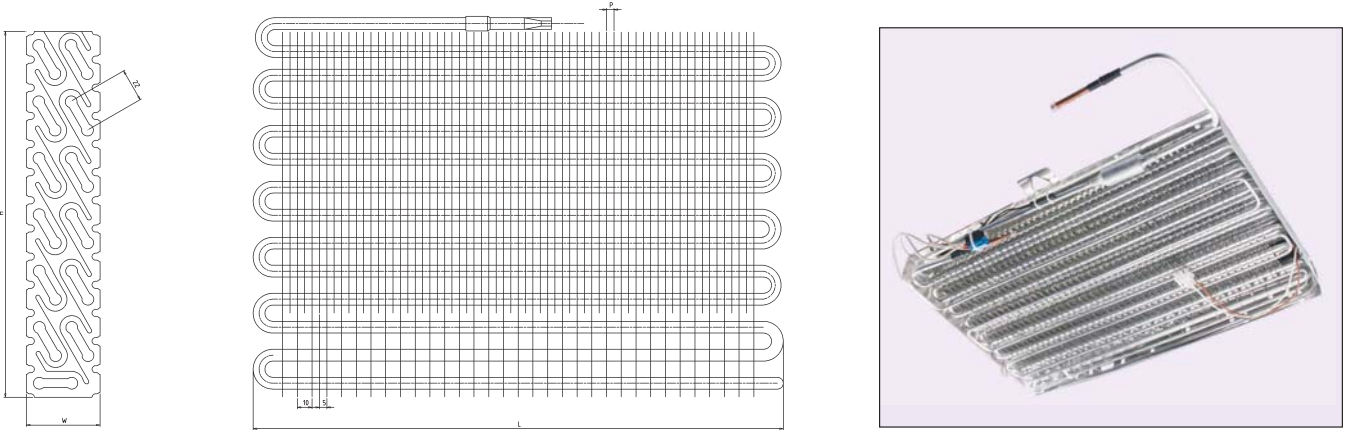


*No-Frost Evaporators  
Evaporators For Supermarket Coolers  
Heater Elements*





## No-Frost (NF) Evaporators



In NO FROST type refrigerators, the humidity in the cabinet is collected as ice on special evaporators, and then it is defrosted automatically and discharged to the outside in the form of water at certain intervals. The defrosting is done via various types of heater elements, and the sequence is controlled by special control elements attached to the evaporators.

The NF Evaporators are manufactured in different designs, each having their own advantages and disadvantages. The one manufactured by KONVEYÖR is known as the Brazeway type (or inclined type), after the U.S. company who developed it many years ago.

The NF evaporators are manufactured by special and automatic machines developed in Konveyor. Below are some features of the product:

- The Al tube used is 8x0.70 mm (also extruded internally).

- Copper inlet and outlet adaptors (stubs) are connected by the Zn-Al alloy soldering or eutectic welding methods.
- The product range:  
L= 250-750 mm  
H= 135 to 590 mm  
W (the fin width)= 35, 42, 50, 60, 75, or 100 mm  
P (Fin spacing) = 4 or 5 mm (or multiples of 4 or 5) in general.
- All evaporators are tested against leak by helium sniffers or chambers and they meet the related internal cleanliness standard.
- Depending on the customer requirements, the evaporators can be assembled with accumulators, suction tubes, heating and control elements and then shipped as ready-to-use in the assembly lines.
- For long distance deliveries, evaporators are packed in carton boxes, and the boxes are placed firm on Euro-pallets.

## Evaporators For Supermarket Coolers

The machinery of this challenging (NF) evaporator was developed in Konveyor and the product is supplied to a US customer. Below are some features:

- The Al tube used is 11.10x0.95 mm (extruded internally),
- The range:  
L = 1100 mm (max)  
H= 152 - 588 mm  
(multiples of 76.2 mm)  
W= 60 or 120 mm  
(fin width)  
P = 6.35 or 8.45 mm  
(or multiples of the same)
- The stub connections, testing, and packaging are the same as in the case of refrigerator NF evaporators.



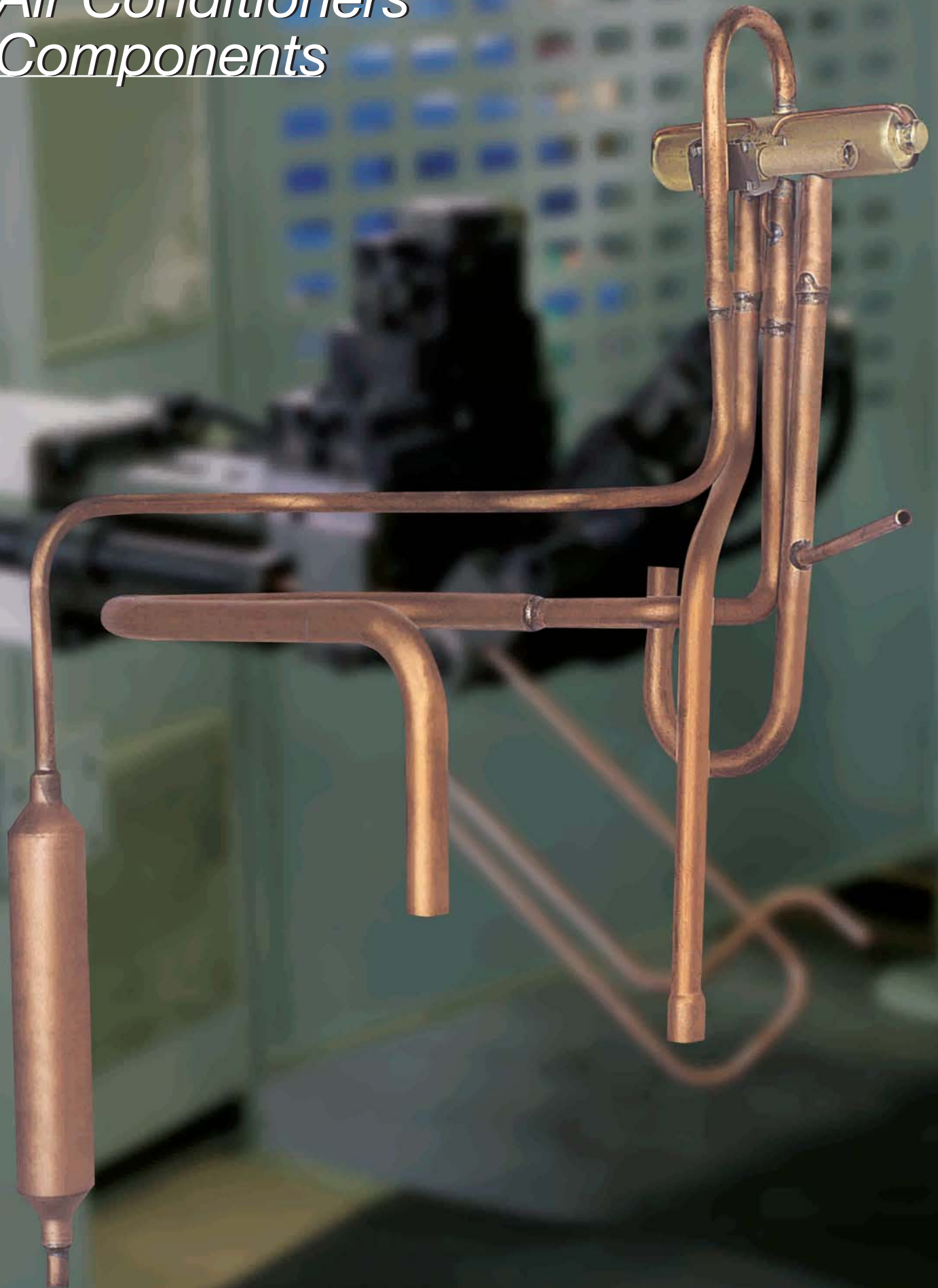
## Heater Elements

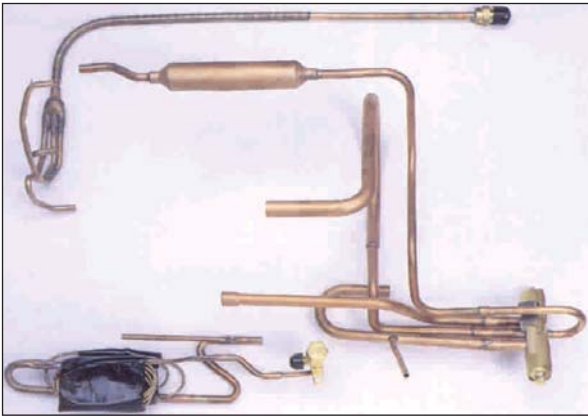
The heater elements used for the defrosting of the NF evaporators are also manufactured in Konveyor. The most critical machines used in the resistance wire and the insulation fibre winding, and also in the terminal mounting were supplied from the respective European specialists. The rest of machinery has been developed in Konveyor. The special size aluminium tube is also manufactured internally. No matter if the power distribution and the terminal tightness/quality are under control in the respective production machines, we still apply the respective tests as 100% in the final products. The other test also applies as 100% is the high voltage test.

Our aim is to put our heater elements in all of the NF evaporators manufactured by Konveyor and to give the respective savings to our customers.



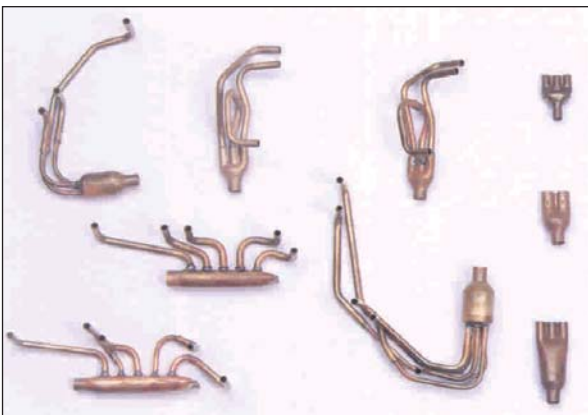
# *Air Conditioners Components*





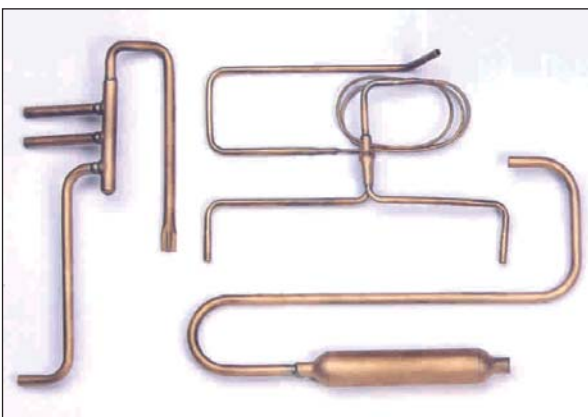
The copper (or aluminium) tube fabrication for the split type Home Air Conditioners is one of the major dealings of KONVEYOR. It can be said that KONVEYOR has the highest capacity in the said fabrication in the wide area covering Europe, Western Asia, and Africa. KONVEYOR also has quite descent experience and knowledge in the tube processing technology.

At KONVEYOR, the copper (or aluminium) connecting tubes are manufactured through the cut-to-length, end forming, CNC bending machines and assembled together on rotating tables by hard brazing (by maintaining nitrogen gas protection inside). The assemblies are 100% tested against leakage.

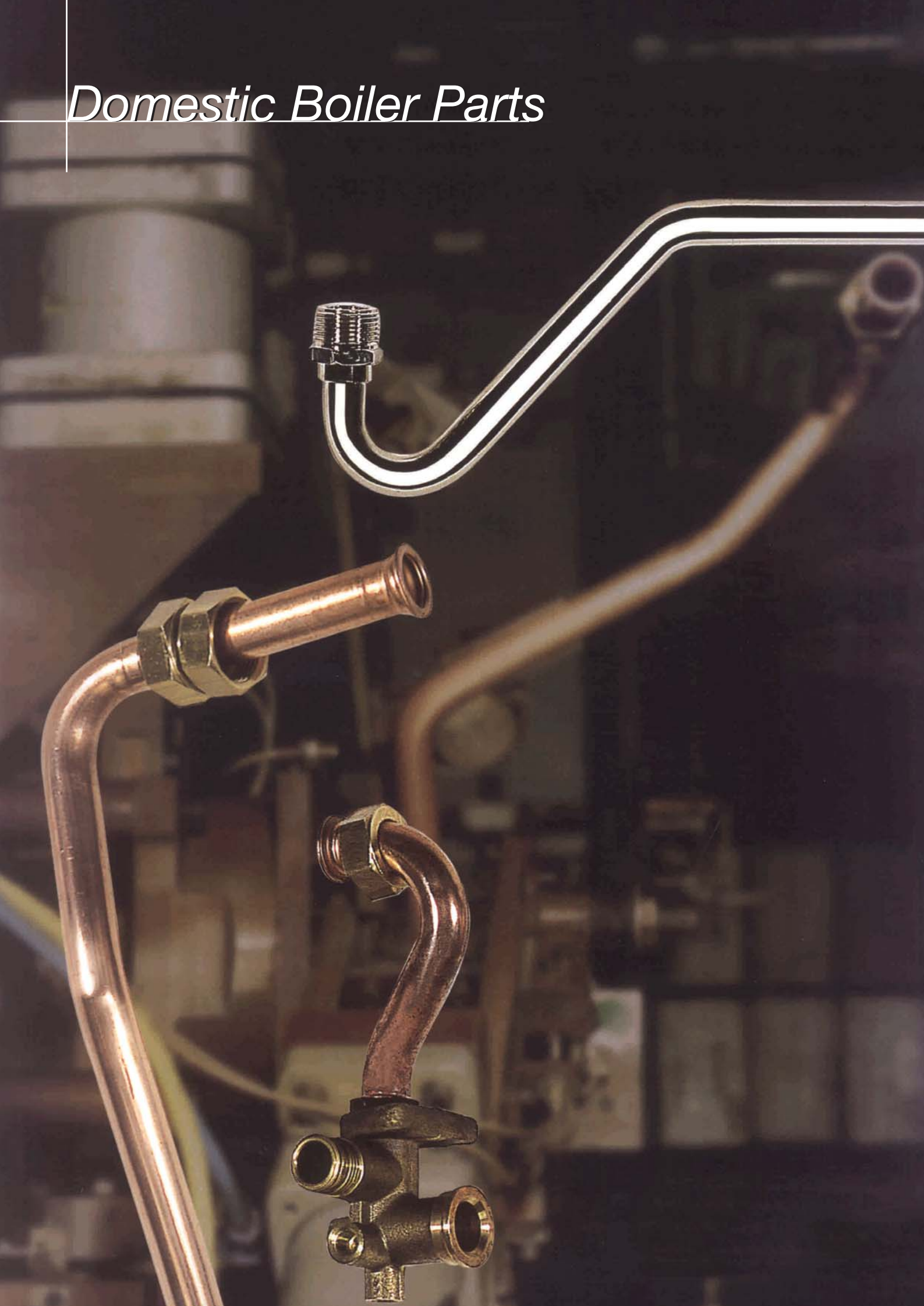


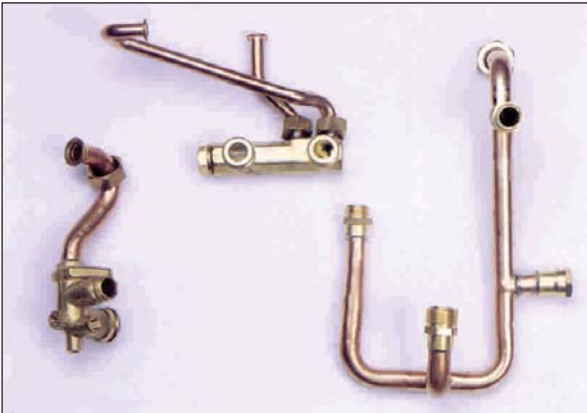
KONVEYOR also manufactures the main connecting tubes remaining in between the indoor and outdoor units. These 3 to 10 meter long tubes had been in copper in the past. Following the jump in the copper prices and demands coming from customers, KONVEYOR successfully converted the said tubes gradually to aluminium within 1-2 years and the conversion was completed as of the end of 2010. The said tubes could also be combined with various accessories and supplied as the MOUNTING KITS to customers.

Following the same trend and the push coming from customers, KONVEYOR has also started to convert the connection tubes remaining interior of the inside and outside units from copper to aluminium as of 2011.



*Domestic Boiler Parts*

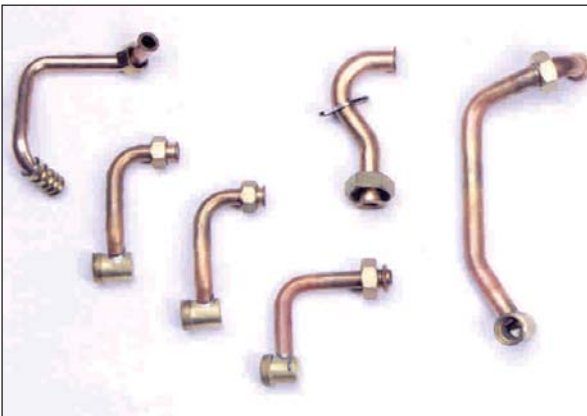




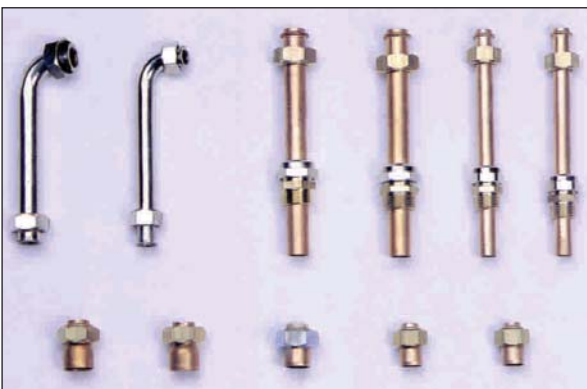
KONVEYOR specializes in fabricated copper tube parts and assemblies that are used in gas water heater units (domestic boilers).

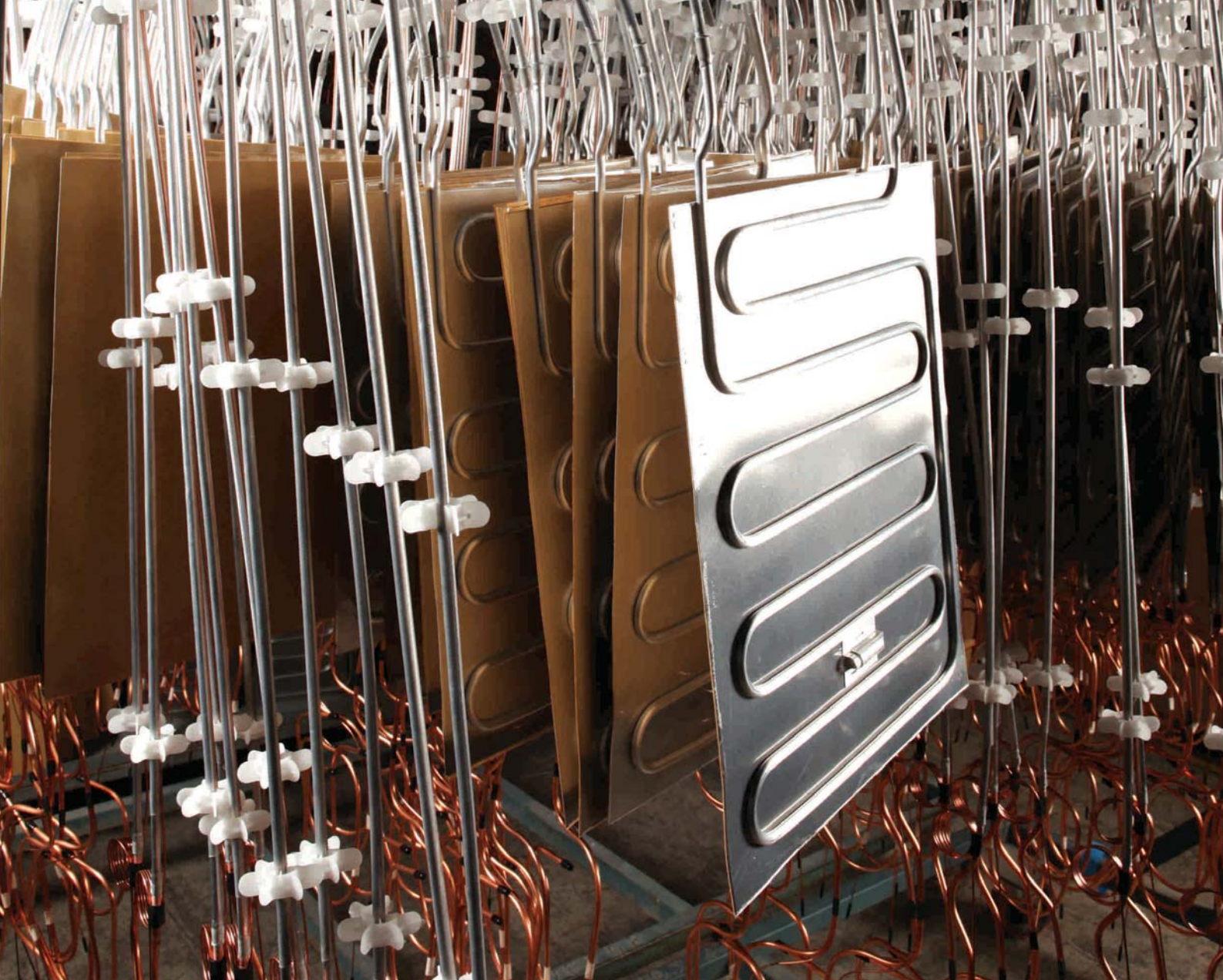
A gas water heater may be a simple unit generating hot water for a household or it may be a more sophisticated unit called "combi units," generating also hot water for home heating. Within the circuit of the combi unit, more sophisticated copper tube assemblies with forged-machined brass bodies or as mounted with special valves are also involved.

On the other hand, some manufacturers prefer shiny looking nickel-plated copper tubular parts for esthetical expectations.



- KONVEYOR manufactures large quantities of a wide variety of such tubular parts and components.
- Major local or European suppliers provide copper tubes either DHP (SF-Cu) grade or as per related standards.
- Forged-machined brass bodies and nickel plating operations are carried out by KONVEYOR's suppliers under KONVEYOR's Quality System.
- Brazing operations are made in-house and all brazed assemblies pass through leak tests as per customer's requirements.
- Parts and components are packed in carton boxes which are placed on Euro-pallets for long distance deliveries.



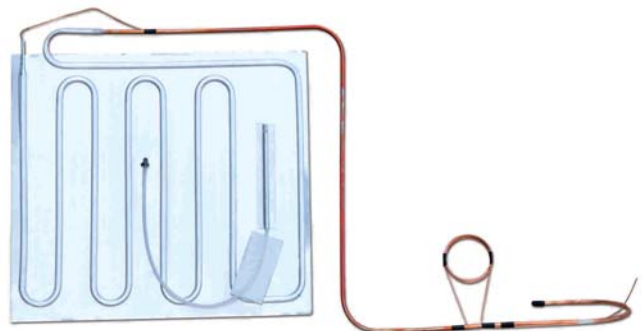
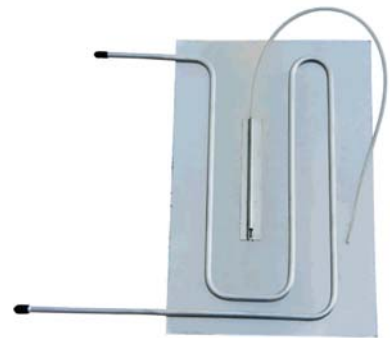


## *TOP (tube-on-plate) Evaporators*

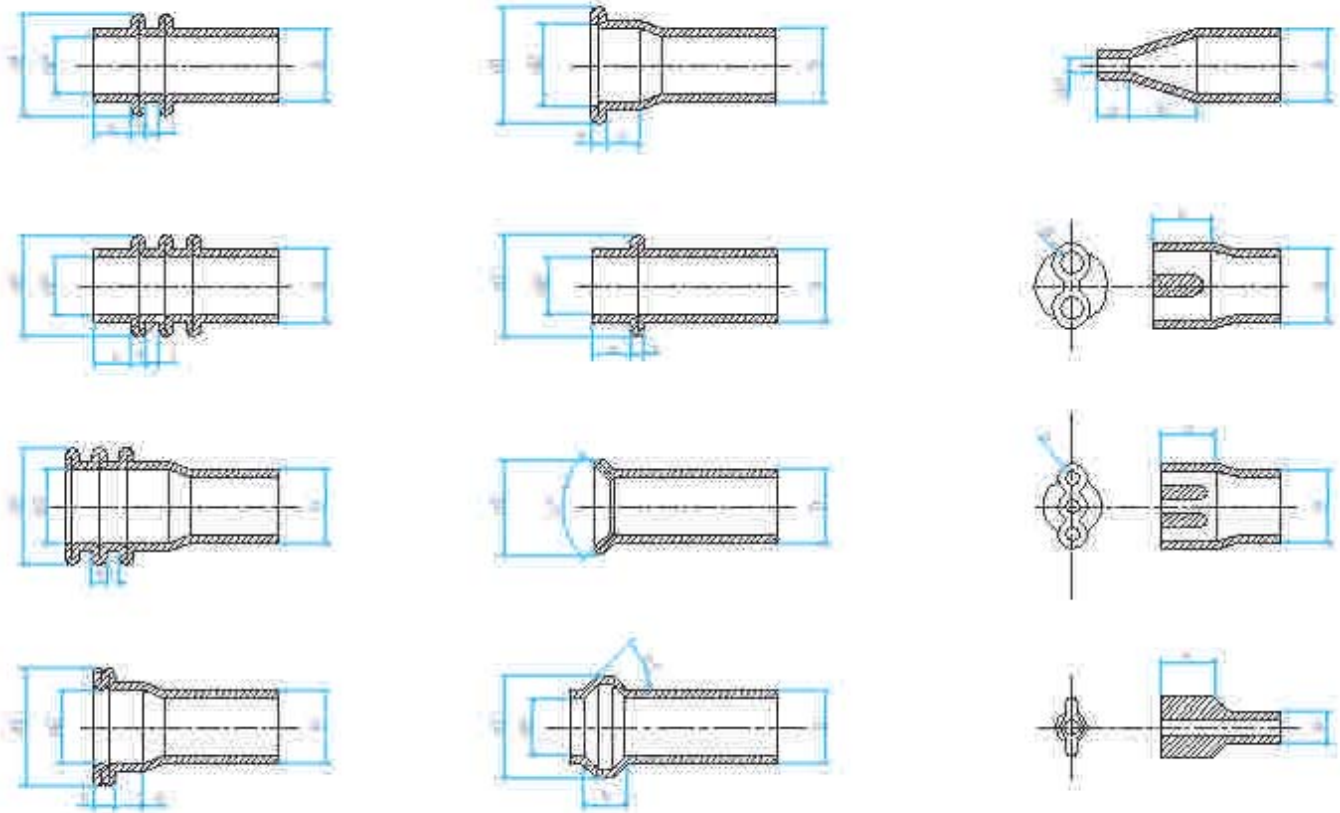
The TOP evaporator in general consists of a thin aluminium plate and an aluminium tube serpentine fixed firm on one side of it. Depending on the application at customer, the evaporator could be supplied as the adhesive paper tape fixed on the reverse side or not, and/or as the (aluminium) heat exchanger connected or not.

The TOP evaporator production was developed and started in KONVEYOR in 2009. All of the respective machines used in the production including the automatic gluing film application on aluminium plates, were all developed by KONVEYOR.

The popularity and wide acceptance of the product at customers have pushed the KONVEYOR's TOP volume to over one million within 1-2 years. It is our aim to further develop the production technique and to continue being the preferred supplier at customers for the said product as well.



# Tube Fabrication



KONVEYOR has extensive knowledge and experience in the tube fabrication. Almost all of the parts and components listed in this site; Al+Cu Connectors, Al or Cu Accumulators, Suction Tube Assemblies, No-Frost and Wire-On-Tube evaporators, et al., are by-products of this experience. In addition, the following tubular parts are also manufactured in KONVEYOR in large volumes:

- Aluminium gas tubes for GAS COOKERS and RANGES, and GAS STOVES, in diameters from 5 to 10 mm.
- Copper charging (service) tubes or tubular adaptors for REFRIGERATORS.
- Fabricated copper tube parts and assemblies for AIR CONDITIONERS, as formed to final shape as ready to use.
- Fabricated copper tube parts or the same as assembled with forged-machined brass parts for WATER HEATERS (domestic boilers).
- Automatic tube-straightening and cut-to-length machines for chipless and no inside diameter reduction at the cut edge (range up to 22 mm OD).
- Semi-automatic tube end-forming machines which are adjustable to single, double or triple hits depending on the type the form required at the tube ends ranging up to 50 mm OD copper.
- Hammer-type swaging machines for conifying the tube ends range from 2 to 40 mm OD copper or steel.
- Spin-type swaging machines for swaging the tube ends range from 10 to 80 mm for copper aluminium tubes.
- CNC Bending Machines both running with tubes in coils, or tubes in pre-cut lengths .
- Brazing, Zn+Al alloy brazing, ultrasonic soldering facilities for Cu-Cu, Cu-brass, Cu-steel, and Cu-Al tube connections.

The following machinery are used in the production of these products:

*Gas Cooker Burner Caps,  
Aluminium Gas Tubes &  
Gas Manifolds*





## Burner Caps

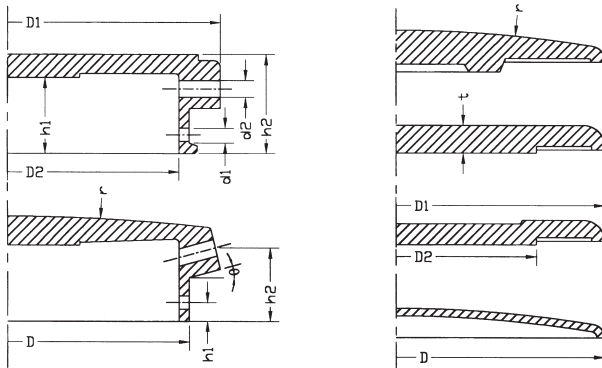


KONVEYOR manufactures a wide variety of aluminium or brass burner caps for gas cookers and ranges.

The material (Al 1050 for the aluminium and MS-58 for the brass burner caps) is hot-forged to part-blank, machined to size, and drilled to final shape. Special technology and machinery developed in-house are used in the raw material (Al blanks) preparation, and also in the manufacturing steps.

Depending on customers' preference, the final surface finish of the caps may be polished, (spherically) machined, and black anodized for aluminium caps, or combined with built-in or removable enamelled lids.

The burner caps described above are supplied as they are. Customers are to assemble them together with other parts to form burner sets.



## Aluminium Gas Tubes



## Gas Manifolds

With the push of an esteemed customer, KONVEYOR started the Gas Manifold's production at the end of 2009 and reached to one million level within 1-2 years.

The 16x1 mm size steel tube is used in the production. All mechanical production steps are carried out internally except the zinc plating operation made at a nearby supplier.

KONVEYOR also works on Aluminium Gas manifolds as a saving project.



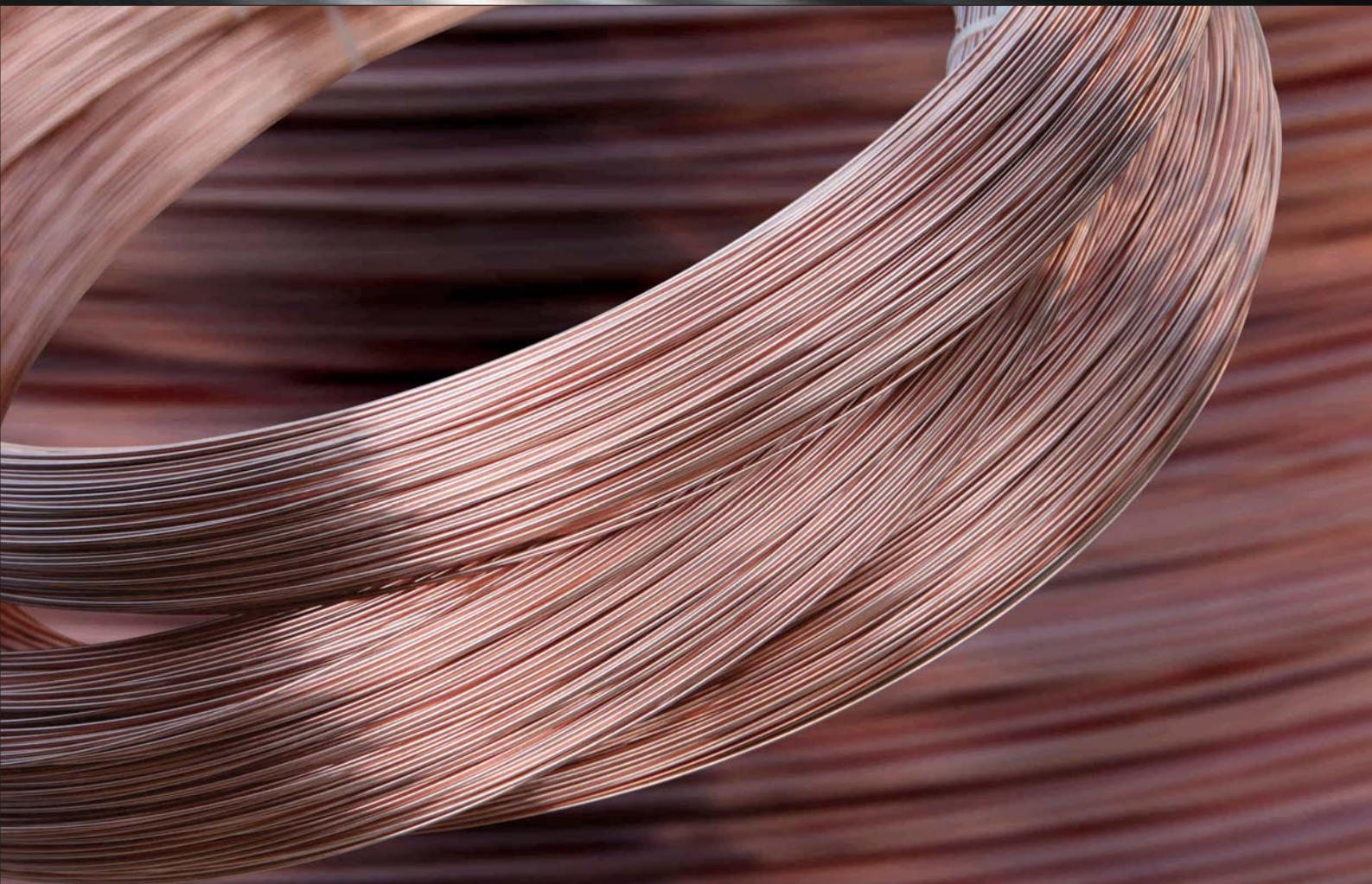
KONVEYOR manufactures over 10 millions of aluminium gas tubes for gas cookers, ranges, and stoves per year. The standard tube diameters may range from 5 mm to 10 mm depending on the application and customers' requirements.

In the production:

- The Aluminium tubes used are produced internally,
- The tubes are cut to lengths in fully automatic machines,
- The tube ends are formed in semi-automatic end-forming machines.
- The brass or steel fittings could be inserted as automatic or manual.
- Manual forming on proper jigs are configured to final shape of the tubes.
- The tubes are bundled and bundles are placed in carton boxes.

The COLD-BEADED (forged) STEEL NUTS production developed in KONVEYOR is a less expensive option for customers as compared to the nuts made by machining from wrought rods.

*Aluminium And  
Capillary Tubes*



## ALUMINIUM TUBE EXTRUSION



KONVEYOR started extruding refrigeration grade aluminium tubes since mid 2006. The product is for internal consumption mainly, but could also be sold if requests should remain within the excess capacity limit.

- RANGE: 5-12 mm OD for refrigeration tubes in coil form; 12-20 mm OD automotive or refrigeration tubes straight lengths.
- ALLOYS: AL 1000 series for refrigeration; AL 3000 series for automotive.
- SPECIFICATIONS: EN 573-3 and EN 755-1
- COILS: 500 mm ID, 800-1200 mm OD, 350-500 mm H; weights up to 200 kg.
- LEAK TESTING: all coils are tested against leak and all coils contain 20 bars of nitrogen inside (the ends are crimped).
- PACKAGING: 4 or 5 coils are placed firm on wooden pallets, the outside is protected by carton and stretch wrapping.

## CAPILLARY TUBES



KONVEYOR manufactures copper capillary tubes for refrigeration and air conditioning applications since 2001. The raw material for this production is 6.35-9.52 mm OD DHP grade copper tubes (mother tubes) supplied in LWC coils from suppliers. The mother tube is cold drawn to final size in various drawing steps. The product is for internal consumption mainly, but could also be sold to current customers depending on the request and capacity conditions.

- RANGE: OD = 1.8-3.5 mm, ID = 0.55-1.5 mm
- ALLOY: 99.9% min Cu (DHP grade)
- COILS: The product is manufactured in 20-25 kg coils
- SPECIFICATION: EN 12735 and EN 12450
- QUALITY: The flow rating is taken under control by regular checks made for each coil being manufactured. The internal cleanliness meets with the DIN 8964 expectation.
- HARDNESS: The product may be "hard, as drawn, F 36", "semi-hard, around F 20" or in "soft" condition. The annealing is made in special oven under control atmosphere available internally.
- PACKAGING: Coils are packed in carton boxes and the boxes are placed firm on wooden pallets (weight per pallet: 400-500 kg).

ALUMINIUM Capillary Tubes are also available at KONVEYOR.

# Factories

Istanbul Plant



Eskişehir Plant-1





## Eskişehir Plant-2



## Free Trade Zone, Tuzla Plant (KONV-EX)



# *Subsidiaries*

MA-KON A.Ş.



KON-MAK A.Ş.





**the supplier...**





#### **Headquarters and Tuzla Istanbul Plant**

##### **Konveyor A.Ş.**

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#### **Free Trade Zone, Tuzla Istanbul Plant (KONV-EX)**

##### **Konveyor Ltd. Şti.**

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#### **Eskişehir Plant - 2**

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