ALUMINIUM PIPE

INSTALLATION GUIDE

Rules to remember when installing Aluminium pipe.

Do's

- Always clean your tools before using them with aluminium. Copper or other metallic impurities can lead to corrosion.
  Suggest: Use a tool kit dedicated to aluminium.
- Always protect the joint from exposure to atmospheric air and moisture. This will keep the joint system free of corrosion. Fully seal the joint between the two metals and cover the complete joint. Use Heat Shrink Sleeve – Adhesive Line Dual Wall shrink sleeve.

Don'ts

- Do not expose uncovered aluminium tubes to liquids dripping from higher- hanging tubes in copper or steel.
- Do not store aluminium tubes with other alloys, as they will contaminate the aluminium tubes.

Aluminium Tubes are easy to install because they are light and flexible.

This guide will help you with the handling and installation of Aluminium Tube.

I don't have much experience with aluminium. How do I install Aluminium tubes?

Aluminium is not as complicated to work with as compared to copper or steel. It is even easier, because it is light and flexible. You are only four steps away from a smooth installation of your HVAC system.

1. Get your tools ready
2. Cut to length
3. Bend and shape
4. Join

1. Get your tools ready
Copper metallic impurities can be encrusted in you tools. To avoid any contamination of the aluminium tubes, clean your tool kit with a wire brush before working with aluminium. Even better to have a second tool kit dedicated to aluminium!

2. Cut to length
Cutting aluminium tubes is done with conventional cutting tools.

Do not exert too much force by turning the wheel of the pipe cutter as this might deform the shape of tubes causing uneven flares on later stage of work. Due to the thickness of tube, more rounds of cuts are required.
Deburring the tube after cutting will prevent cracking during flanging.

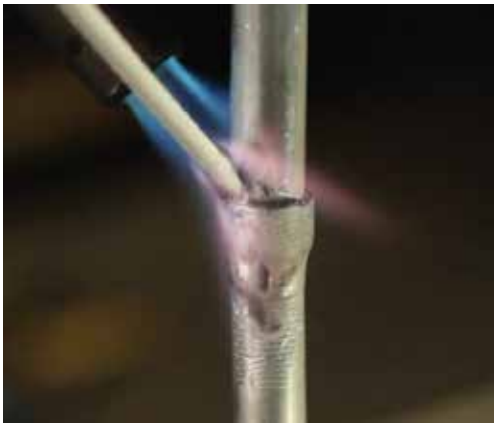
3. Bend and Shape
a. Using a hand –bending tool
Less bending force is required for bending aluminium than for bending copper tubes. Moreover, there is almost no spring back effect.
b. Or Manually
Aluminium Tubes are flexible enough to be bent by hands. It is especially convenient for shaping loops or non-conventional shapes.

4. Join
There are two easy ways:
1. By using mechanical connector (flare nuts & union)

2. By using brazing joint
The flare nuts and union connections that HVAC industry has used to join copper and steel can also be used for joining aluminium. Do not forget to protect the joint with a heat shrink sleeve to avoid corrosion!
Flaring –A new set of eccentric Cone Type Flaring tools is recommended.

Features:
Self-cantering mould: HIGHEST FLARE PRECISION
Flare cone rotates off-centre in needle bearings: CONTROLLED EXPANDING AND SHAPING OF TUBE END WITHOUT TEARING
Spring-loaded side coupling: NO REDUCTION IN WALL THICKNES
Swaging – Swaging of aluminium tube requires lesser strength and effort. We recommend a new set of Swivel-Type swaging tools against punching type swaging tool. Allowance on length of swage shall be the same as working with copper. (EG. from mm to mm)

Brazing – Brazing aluminium tube can be 5 times faster than copper. Ensure that brazing rod is used at all joints. Due to a lower melting point of aluminium, controlling the flame of torch is essential and this would require some practise. The catch is when the flame starts to turn orangey colour, which is when brazing rod must be dipped at 45 degrees angle. All brazing rod are flux coated, not much turning is required as the filler would run around to fill the gap. Allow at least a minute for the joint to cool before further working on it.



Tightening – tightening of flare nut requires lesser strength. Due to the flexibility of Aluminium, the flare would wrap around the inlet union if proper strength are exerted. Do not over tighten as this might cause stress cracks on the flare resulting to a leak

Is Aluminium more difficult to braze than copper?
No, it is not. Flame brazing aluminium to aluminium is very similar to copper to copper brazing. In addition, the temperature window is narrower when brazing aluminium compares to copper, which makes it necessary to maintain more accurate brazing temperatures. However, this is just a matter of training.

Corrosion protection

Is there any risk of corrosion using connector in aluminium?

As with other metals, yes, but aluminium has very low corrosion rates compared to steel and copper. This is due to the protecting oxide layer that forms immediately on the aluminium surface when exposed to the environment. This is a general characteristic that applies to aluminium as "stand alone." As part of a system however corrosion may occur if the system is poorly engineered and has aluminium coupled with another metal. This type of corrosion is called galvanic corrosion.

What is galvanic corrosion and how can it be avoided?

Galvanic corrosion occurs when two dissimilar metals with different electrode potential are coupled in the presence of an electrolyte. As an example, if aluminium is jointed to copper and the system is exposed to atmospheric air and moisture, then the less noble material (the aluminium) will corrode. To avoid such corrosion, a few simple rules have to be respected when install Aluminium Tubes. Following the below rules, will improve the lifetime of your system.

Heat Shrink Sleeve – Adhesive Line Dual Wall shrink sleeve is recommended to apply on the connection between brass nuts and pipe. The heat shrink outer sleeve and hot melt adhesive lining is designed to insulate and seal the joints against moisture and water. Ensure that at least 30cm of Armour sleeve is inserted to pipes, before inserting flare nut and performing a flare. After connecting to union of compressor, push sleeve covering the entire flare nut and union. Flame or heat gun can be used to shrink the sleeve. Shrink tubes with flame or heat gun until no wrinkles on sleeve can be seen.

Recommendation

- Coupling area: A properly applied heat – shrink sleeve must be covering the connecting line and onto the brass coupling.

- Line areas: The Thermal insulation foam should cover the complete connecting line from coupling to coupling not exposing the tube to the environment.

WHY BUY ALUMINIUM TUBE

Flexibility & Strength
- Offers more flexibility and does not kink easily
- Higher wall thickness (G18) provides better tensile strength
- Able to withstand burst pressure of more than 1000psi without sign of leakage

Brazing & Repair
- Braze Rods allows up to 45-50 joints per rod (50cm rod)
- No additional flux is required
- Joints are stronger than main material
- Fast & secured joints in less than 15s, 4 times faster than to braze copper
- Uses the same method to braze copper
- No argon gas, wire spool, gloves, shield or electricity required

Burst Pressure
- Tested to meet ASTM B280-02 (9.4 Mpa),
- ASTM E 1251-99, TCVN 1832:2008 (18Mpa)
- Tested to meet ASTM B75 @ 1000PSI

Lightweight & Durable
- Requires lesser strength to bend
- Using the same set of bending tools as copper
- Manufactured up to 1.5mm wall thickness providing superior rigidity

Length & Packaging
- Design to 50 metres length per coil
- Lesser joint, lesser tendency of leakage
- Longer length, lesser wastage

Corrosion Resitsancy
- 48 hours salt water test before shipment
- Corrosion rate is very much lesser than copper
- Oxidisation rate is also lower making pipes clean and bright when exposed

Thermal Conductivity
- Lower than copper by almost 50% this means lesser rate of condensation

Swaging & Expanding
- 30% expansion from original OD
- Using the same set of swaging tools as copper

Technical Specifications

	Aluminium Tube Size					
Item Number	Outer Diameter (inches-mm)	Wall Thickness (mm)	Carton Dimensions (cm)	Length (m)	Weight per carton (kg)	Burst Pressure (PSI)
AAC0635100	1/4" - 6.35	1.0	27 x 9 x 27	50	2.4	3900
AAC0952100	3/8" - 9.52	1.0	33.5 x 11 x 33.5	50	3.8	2400
AAC1270120	1/2" - 12.70	1.2	46.5 x 12 x 46.5	50	6.3	2000
AAC1588120	5/8" - 15.88	1.2	55.5 x 12 x 55.5	50	8.2	1800
AAC1905150	3/4" - 19.05	1.5	66.5 x 11.5 x 66.5	50	12 0	1700