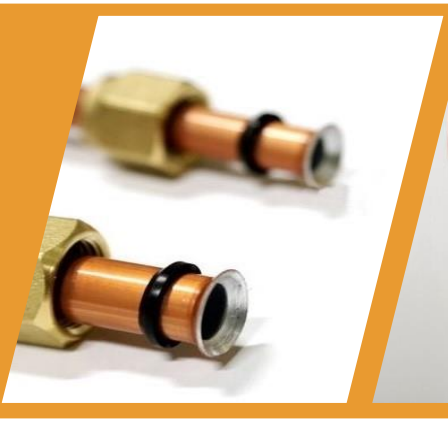
19.09 Ver.

New Generation
Air Conditioner Tube



BENZSON
INTERNATIONAL

1. Copper & Aluminum Tube Defect Improvement

Copper Tube

- Welding point will leak Freon
- High cost
- Heavier
- Unable to specify length
- High conductivity cause frost

Aluminum Tube

- Corrosive
- Fragile while expanding tube
- Oxidize & low compressive strength
- Non-recyclable
- Unable to specify length
- Special tool requirements

Nylon Tube

NEW

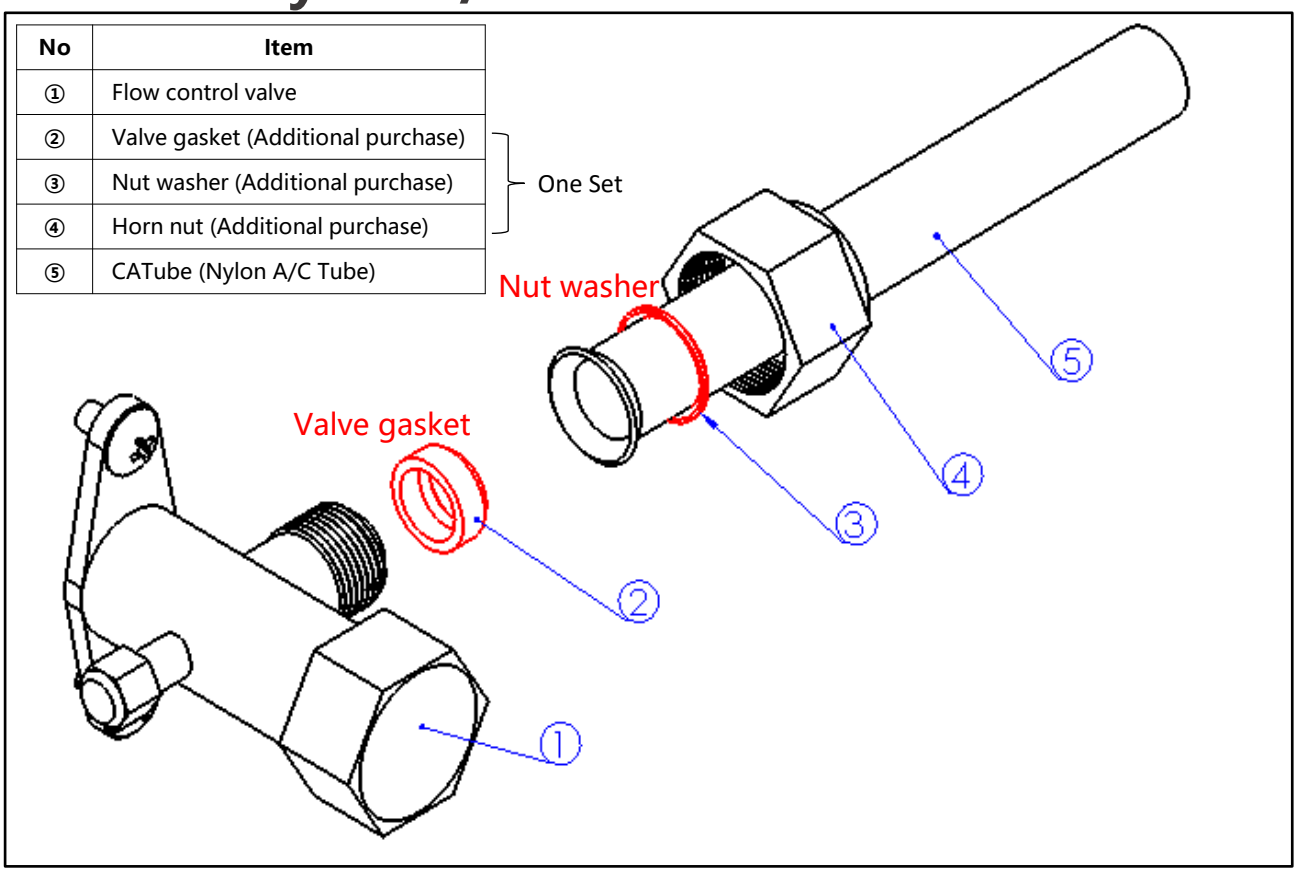
CATube Nylon A/C Tube

- No welding required
- cheaper
- 65% lighter than copper
- Length customization
- Semi-permanent corrosion protection surface coating
- The same way as the copper tube to expand, but use rubber gaskets to prevent cracking
- Usable after moving
- High compressive strength
- No special tool demand

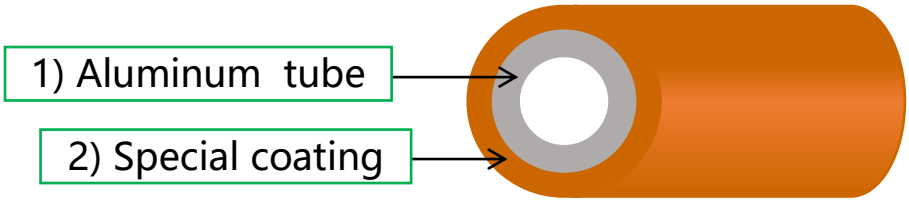
2. CATube Nylon A/C Tube links method

No	Item
①	Flow control valve
②	Valve gasket (Additional purchase)
③	Nut washer (Additional purchase)
④	Horn nut (Additional purchase)
⑤	CATube (Nylon A/C Tube)

One Set



3. Product structure and specifications



- Format

- Salt spray test: KSD8502, 720HR
- Freon： R32，R410A
- Temperature： 100ºC/720HR, -30ºC/720HR
- 250,000 cycle test
- Pressure：30.4Kg/㎠
- Vibration：Up to 0.1S -5Hz

- Sizes : The outer diameter of CATube is the same as copper tube

Format		Outer Diameter	Thickness		Weight
Inch	mm		Aluminum	Nylon	gr/m
1/4	6.35	6.35 mm	0.80 mm	0.180 mm	39.15 gr
3/8	9.52	9.52 mm	0.90 mm	0.180 mm	69.12 gr
1/2	12.70	12.70 mm	1.00 mm	0.180 mm	104.65 gr
5/8	15.88	15.88 mm	1.10 mm	0.180 mm	145.28 gr

- Aluminum
- A3003 / A1100
- Seamless processing aluminum tube

- Special coaing
- Nylon resin： French Rhodia D236AL/BRN
- CATube Nylon resin is better than PA12 on anti-heat and anti-UV
- The same colour and luster as copper tube

- Packing unit
- Standard： Set，String，Bundle(Level Winding)
- Packing and length customization

4. The Advantage of Nylon A/C tube

Economical

- Cheaper than copper tubes
- No special tool demand (The same as the tools of copper tubes)

Convenience

- Good bending and easier to install
- Lighter
- Needless to remove the nylon jacket during installation

Durability

- Excellent anti-corrosion (Salt spray test : KSD9502, 720HR)
- Heat and cold resistance
- Anti-corrosion potential
- Impact resistance
- pressure tolerance (With testing report and certification)

5. The features of Nylon A/C tube

Semi-permanent corrosion protection	Different from another PE coating tube	Length customization	Cheaper & 65 % lighter than copper tube
Flexibility, and the coatings do not crack or deform	The tools are the same as the tools of copper tubes	Needless to remove the nylon jacket during installation	Usable after moving

6. Compare with others

- **Compare with copper and others**

Property	Copper	Eutectic bonding	PE coating tube	CATube
Weight	X	△	◎	◎
Length customization	◎	X	◎	◎
Flexibility	○	◎	◎	◎
Anti-corrosion potential	◎	X	X	◎
Anti-corrosion	○	X	△	◎
Expanding	◎	◎	X	◎

※ ◎ : Great / ○ : Good / △ : Normal / X : Bad

- Compare thickness and weight with copper tube

Format (cm, inch)	Copper tube		CATtube		Weight Ratio
	Thickness	Weight	Thickness	Weight	CATube /Copper
2 cm(1/4")	0.7mm T	1.7 KG	**1.0mm T**	**0.6 KG**	**35%**
3 cm(3/8")	0.7mm T	2.6 KG	**1.1mm T**	**1.0 KG**	**40%**
4 cm(1/2")	0.8mm T	4.0 KG	**1.2mm T**	**1.6 KG**	**39%**
5 cm(5/8")	0.8mm T	5.1 KG	**1.3mm T**	**2.2 KG**	**43%**
Average		3.3 KG		**1.3 KG**	**40%**
7.95 mm	**0.6mm T**	**1.9 KG**	**0.88mm T**	**0.7 KG**	**39%**

7. Additional Purchase

■ Coupler & Gasket

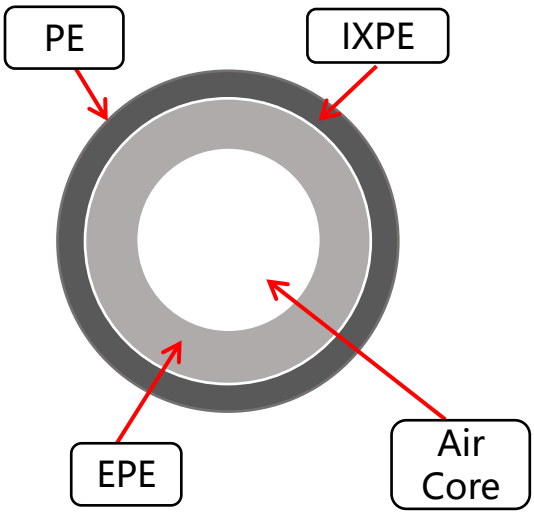
① Characteristic
- Easy to install
- No welding required
- Great air-tightness

② Advantage
- Easy to install tightly on copper or aluminum
- Install on the part of air-tightness
- Fitting to all types (ex: L or T type), and easy to install tightly

③ Economical
- Cheaper
- Lighter
- Easy to install tightly

④ Applicability
- Available for all A/C sizes

■ Heat Insulation Material with Embossing



① Characteristic
- PE heat insulation material & IXPE middle diameter & EPE outer diameter
- Cold & heat air, new Freon are available
- 120ºC heat resistance standard

■ The Tools for Expanding

① Available range
- 2 cm(6.35mm), 3 cm(9.52mm), 4 cm(12.70mm), 5 cm(15.88mm)

② Applicability
- The interface is not easily damaged
- Use for new Freon
- The tools are the same as the tools of copper tubes

8. CATube Testing Report

Item		Testing Method	Criteria	Result	Note
Mechanical Properties	Internal Pressure	Remove air from tube, and pressurize with oil pressure	127kgf/cm2 ↑	Pass	The oil pressure is (42.3 kgf/cm2)*3
	Fatigue Test	(4kgf/cm2 ↔ 35kgf/cm2)*250000 times	No damage or leakage	Pass	Approved pressure cycle is 3Hz
	Coating	Cutting at 10mm intervals and test	Above 1/4" ,3/8" ,1.5kgf; 1/2" ,5/8" 2.0kgf	Pass	
	Grip Test	Tensile test	Tensile loading above 70kgf	Pass	
	Airtight	In the tightened state, 30kgf/cm2 air-pressure	No leakage gas	Pass	
Thermal Environment	Anti-Heat	Place in a thermostat at 120°C for 72hr	No leakage gas, peeling and wrinkling	Pass	
	Anti-Cold	Place in a thermostat at -30°C for 72hr		Pass	
	Thermal Shock	(120°C 2hr ↔ -30°C 2hr)*100cycle		Pass	
Corrosion Environment	SST	35°C NaCl 5% 720hr	No corrosion	Pass	Continuous spray or (8hr spray↔16hr halt)
	CCT	NaCl 0.9%+CaCl2 0.2%+NaCO3 0.25% +temperature change (25~60°C)		Pass	20 cycle, 600 hr
	CASS	NaCl 5%+CuCl2 0.26g/l (with Acetic acid pH3.1 ~3.3)		Pass	(8hr spray↔16hr halt), 480hr
	SWAAT	5% Artificial seawater, 49°C (with pH 2.8~3.0)		Pass	0.5hr spray↔1.5hr wet (95%)
	Prohesion	0.05% NaCl+0.35%(NH4)2SO4 Ph 5.0~5.4		Pass	600hr, spray for 1hr ↔drying for 1hr