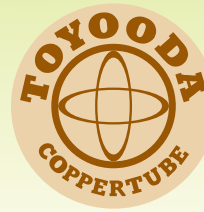


TOYOODA®

COPPER TUBE and PRE INSULATED PAIRED COPPER COIL

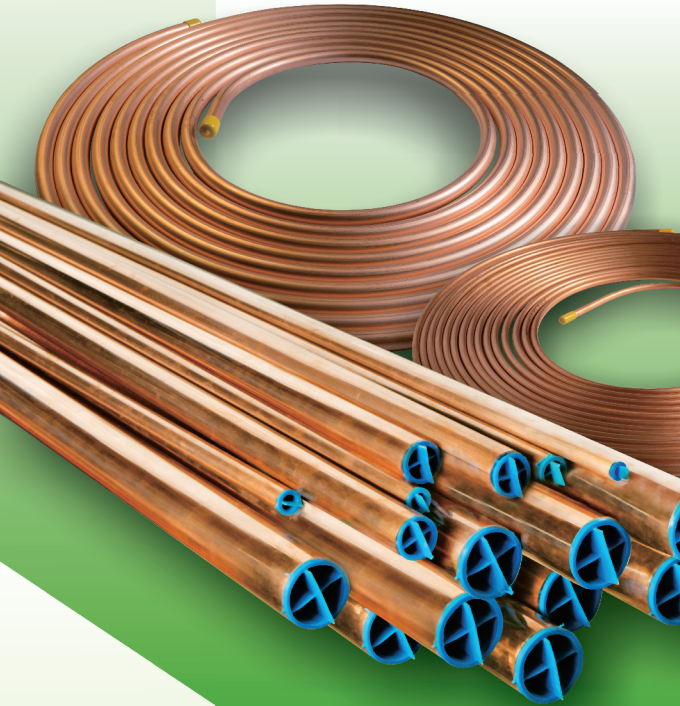


ASTM B280
ASTM B819
ASTM B88
AS 1571

Air Conditioning, Refrigeration, Medical Gas, General Plumbing, HVAC, Fuel, Gas Distribution and Fire Sprinkler Installation

Advantages of Copper Tubes

1. **Tried and Tested** | Copper gives consistently good results in HVAC, Plumbing and Heating installations of every type, it's strong, adaptable and tough.
2. **Versatile** | Copper tube and fittings can be used in every part of a HVAC, Plumbing and Heating system, with total confidence.
3. **Long Lasting** | Copper is durable. It's strong and resists damage, so you can rely on copper tube and fittings for decades.
4. **Healthy and Safe** | Copper tube will not burn or support combustion and decompose to toxic gas.
5. **Good Value for Money** | Copper gives an excellent result, combination of easy handling, forming and joining permits savings in installation time, material and overall costs.
6. **Recyclable** | Copper keeps value. Over 90% of copper is recyclable, which benefits both the environmental and the HVAC and Plumbing profession.
7. **Resists Heat, Corrosion, Pressure and Fire** | Excellent resistance to heat, corrosion, pressure and fire. It doesn't burn, it's keeps it shape and strength in high temperature environments and gives long life in service.
8. **Non-Permeable** | Copper gives excellent protection against contaminants to the domestic water supply.
9. **Professional Skills** | Copper is ther natural choice for professional plumbing and heating work.
10. **Industry Support** | Copper tube and fittings come from a worldwide industry with decades of experience and a long term commitment to supplying quality products at competitive prices.



ASTM B280
JIS H3300: C1220T
AS 1571

Introduction

Toyooda insulation is a three (3) layers product composed of inner pipe insulation (Physical Cross-linked), middle layer (Irradiation Cross-linked), and outer UV resistant PE film. It features Anti-Abrasion, Anti-Impact, and Anti-Aging.

The closed cell bubbles are foamed by Physical Cross-linked PE (specially formulated). The inner pipe insulation is foamed continuously without seam and closely welded with the outer 2 layers. The insulation pipe has no air pocket among layers.

The special structure ensures low water absorption and good thermal insulation. It contains no corrosive material to the copper pipe. High temperature Resistant Type Insulation features working temperature from -70°C to 120°C. The good thermal insulation performance ensures no condensation which avoid contamination of condensed water.

Toyooda insulation copper tube is an updated product with improved material and composition. It features by anti-condensation, easy installation, easy to transport, easy to bend and easily to separated.

Toyooda insulation tube is a three (3) layers closed cell Physical Cross-linked 30 times and Eco Friendly PE Foam. The inner layer is seamless insulation tube. It has better anti condensation character due to smaller distance between insulation and copper tube. Outside embossed anti UV film can protect surface from scratching, deforming, and aging.

Toyooda ASTM B280 and JIS H3300 C1220T copper tube is Annealed treatment coil (20m) and Hard straight length tube (5.8m).





Toyoda® SEAMLESS COPPER TUBE ASTM B 280

For : Air Conditioning, Refrigeration and Natural Gas

For Annealed Coil Copper Tubes

Standard Size Inch	Outside Diameter Inch (mm)	Wall Thickness Inch (mm)	Weight, lb/ft (kg/m)	*Safe Working Internal Pressures PSI (KPa) 150°F
1/8	0.125 (3.18)	0.030 (0.76)	0.0347 (0.0516)	2613 (18013)
3/16	0.187 (4.76)	0.030 (0.76)	0.0575 (0.0856)	1645 (11340)
1/4	0.250 (6.35)	0.030 (0.76)	0.0804 (0.120)	1195 (8238)
5/16	0.312 (7.92)	0.032 (0.81)	0.109 (0.162)	1017 (7011)
3/8	0.375 (9.52)	0.032 (0.81)	0.134 (0.199)	836 (5763)
1/2	0.500 (12.70)	0.032 (0.81)	0.182 (0.271)	618 (4260)
5/8	0.625 (15.88)	0.035 (0.89)	0.251 (0.373)	525 (3619)
3/4	0.750 (19.05)	0.035 (0.89)	0.305 (0.454)	435 (2999)
7/8	0.875 (22.23)	0.045 (1.14)	0.455 (0.677)	495 (3412)
1 1/8	1.125 (28.58)	0.050 (1.27)	0.665 (0.975)	420 (2895)
1 3/8	1.375 (34.93)	0.055 (1.40)	0.884 (1.32)	373 (2571)
1 5/8	1.625 (41.28)	0.060 (1.52)	1.14 (1.70)	347 (2392)

Note : Tubes are supplied in 15 meter for annealed coil copper tubes

For Hard Drawn Straight Length Cooper Tubes

Standard Size Inch	Outside Diameter Inch (mm)	Wall Thickness Inch (mm)	Weight, lb/ft (kg/m)	*Safe Working Internal Pressures PSI (KPa) 150°F
3/8	0.375 (9.52)	0.030 (0.76)	0.126 (0.187)	1367 (9423)
1/2	0.500 (12.70)	0.035 (0.89)	0.198 (0.295)	1168 (8051)
5/8	0.625 (15.88)	0.040 (1.02)	0.285 (0.424)	1082 (7458)
3/4	0.750 (19.05)	0.042 (1.07)	0.362 (0.539)	947 (6528)
7/8	0.875 (22.23)	0.045 (1.14)	0.455 (0.677)	873 (6018)
1 1/8	1.125 (28.58)	0.050 (1.27)	0.655 (0.975)	741 (5108)
1 3/8	1.375 (34.93)	0.055 (1.40)	0.884 (1.32)	658 (4536)
1 5/8	1.625 (41.28)	0.060 (1.52)	1.14 (1.70)	613 (4226)
2 1/8	2.125 (53.98)	0.070 (1.78)	1.75 (2.60)	545 (3757)
2 5/8	2.625 (66.68)	0.080 (2.03)	2.48 (3.69)	504 (3474)
3 1/8	3.125 (79.38)	0.090 (2.29)	3.33 (4.96)	476 (3281)
3 5/8	3.625 (92.08)	0.100 (2.54)	4.29 (6.38)	455 (3136)
4 1/8	4.125 (104.78)	0.110 (2.79)	5.38 (8.01)	440 (3033)

Note : Tubes are supplied in 5.8 meter for straight tubes

Copper Pipe Technical Properties

Description	Copper Alloy No.	Copper (min)	Phosphorus	Temper :		Tensile Strength :		Elongation (min)
				Coil	Hard Drawn	Coil (min)	Hard Drawn (min)	
Value	C12200	99.90	0.015 - 0.040	O 60	H 58	205	250	40
Unit		%	%			Mpa	Mpa	%

TECHNICAL DATA

Values of allowable internal working pressure for copper tube in service are based on the formula from ANSI B31, Standard Code for Pressure Piping :

$$P = \frac{2 S t m}{D \max - 0.8 t m}$$

P = Allowable pressure
S = Allowable stress
T = Wall thickness
D max = Outside diameter

@ 150°F S = 5100 PSIG annealed
@ 300°F S = 4700 PSIG annealed
@ 150°F S = 9000 PSIG hard drawn
@ 300°F S = 8700 PSIG hard drawn



Toyooda® SEAMLESS COPPER TUBE

ASTM B 819

For : Medical Gas

TYPE L

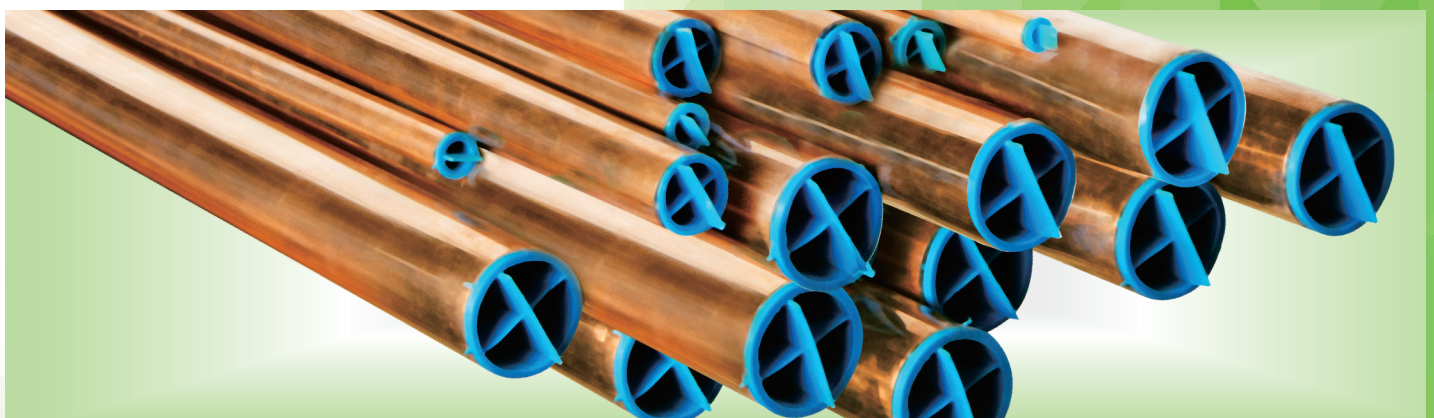
Standard Size Inch	Outside Diameter Inch (mm)	Wall Thickness Inch (mm)	Nominal Weight kg/m	*Safe Working Internal Pressures			
				Hard Drawn			
				PSI		KPa	
				150°F	300°F	150°F	300°F
3/8	0.375 (9.52)	0.030 (0.76)	0.188	1367	1322	9423	9113
1/2	0.500 (12.70)	0.035 (0.89)	0.295	1168	1129	8051	7783
5/8	0.625 (15.88)	0.049 (1.02)	0.425	1082	1046	7458	7211
3/4	0.750 (19.05)	0.049 (1.07)	0.539	947	916	6528	6315
7/8	0.875 (22.23)	0.065 (1.14)	0.667	873	844	6018	5818
1 1/8	1.125 (28.58)	0.065 (1.27)	0.975	741	717	5108	4943
1 3/8	1.375 (34.93)	0.065 (1.40)	1.317	658	636	4536	4384
1 5/8	1.625 (41.28)	0.072 (1.52)	1.703	613	592	4226	4081
2 1/8	2.125 (53.98)	0.083 (1.78)	2.609	545	527	3757	3633
2 5/8	2.625 (66.68)	0.095 (2.03)	3.692	504	487	3474	3357
3 1/8	3.125 (79.38)	0.109 (2.29)	4.954	476	460	3281	3171
3 5/8	3.625 (92.08)	0.120 (2.54)	6.393	455	440	3136	3033
4 1/8	4.125 (104.78)	0.134 (3.79)	8.010	440	425	3033	2930
5 1/8	5.125 (130.18)	0.160 (3.18)	11.335	404	390	2785	2689
6 1/8	6.125 (155.58)	0.192 (3.56)	15.196	376	364	2592	2509
8 1/8	8.125 (206.38)	0.271 (5.08)	28.745	406	392	2799	2702

Note : Tubes are supplied in 5.8 meter for straight length

Manufactured in Accordance with American Society for Testing and Materials (ASTM Standard)

Tube supplied to ASTM Standards is a minimum of 99.9 percent pure copper.

Copper Pipe Technical Properties		
Description	Value	Unit
Copper Alloy No.	C12200	
Copper (min)	99.90	%
Phosphorus	0.015 - 0.040	%
Temper :		
- Hard Drawn	H 58	
Tensile Strength :		
- Hard Drawn (min)	250	Mpa
Elongation (min)	40	%





Toyooda® SEAMLESS COPPER TUBE AS 1571

For : Air Conditioning and Refrigeration

For Annealed Coil Copper Tubes

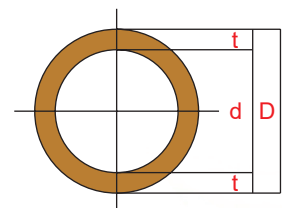
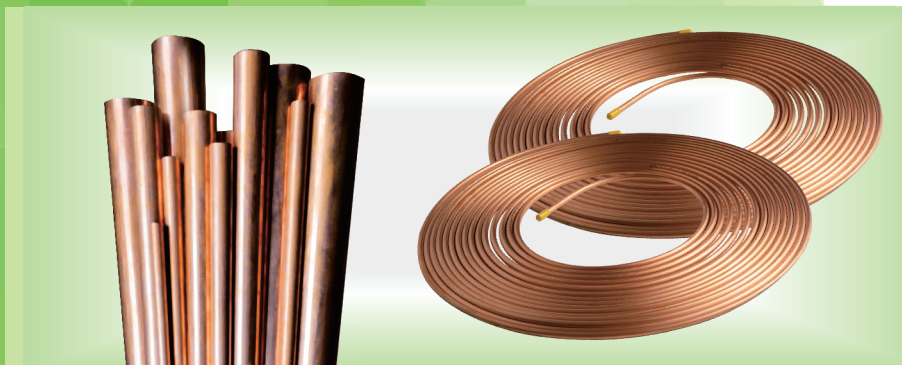
Standard Size Inch	Outside Diameter Inch (mm)	Wall Thickness Inch (mm)	Nominal (kg/m)	Safe Working Internal Pressure PSI (Kpa) 150°F
1/4	0.250 (6.35)	0.022 (0.56)	0.091	823 (5668)
1/4	0.250 (6.35)	0.024 (0.61)	0.098	902 (6216)
1/4	0.250 (6.35)	0.028 (0.71)	0.113	1065 (7335)
3/8	0.375 (9.53)	0.022 (0.56)	0.141	535 (3685)
3/8	0.375 (9.53)	0.024 (0.61)	0.153	585 (4032)
3/8	0.375 (9.53)	0.028 (0.71)	0.176	687 (4735)
1/2	0.500 (12.70)	0.022 (0.56)	0.191	396 (2730)
1/2	0.500 (12.70)	0.024 (0.61)	0.207	433 (2984)
1/2	0.500 (12.70)	0.026 (0.66)	0.223	470 (3239)
1/2	0.500 (12.70)	0.028 (0.71)	0.239	507 (3496)
5/8	0.625 (15.88)	0.022 (0.56)	0.241	315 (2168)
5/8	0.625 (15.88)	0.024 (0.61)	0.262	344 (2368)
5/8	0.625 (15.88)	0.028 (0.71)	0.303	402 (2771)
3/4	0.750 (19.05)	0.024 (0.61)	0.316	285 (1963)
3/4	0.750 (19.05)	0.028 (0.71)	0.366	333 (2295)

Note : Tubes are supplied in 15 meter for annealed coil copper tubes

For Straight Length Copper Tubes

Standard Size Inch	Outside Diameter Inch (mm)	Wall Thickness Inch (mm)	Nominal (kg/m)	Safe Working Internal Pressure PSI (Kpa) 150°F
3/8	0.375 (9.53)	0.024 (0.61)	0.153	1032 (7155)
3/8	0.375 (9.53)	0.028 (0.71)	0.176	1212 (8356)
1/2	0.500 (12.70)	0.028 (0.71)	0.239	895 (6169)
5/8	0.625 (15.88)	0.028 (0.71)	0.303	709 (4889)
3/4	0.750 (19.05)	0.028 (0.71)	0.366	587 (4049)
7/8	0.875 (22.23)	0.028 (0.71)	0.429	501 (3455)
1	1.000 (25.40)	0.028 (0.71)	0.493	437 (3014)
1	1.000 (25.40)	0.032 (0.81)	0.560	500 (3449)
1	1.000 (25.40)	0.048 (1.22)	0.829	764 (5265)
1 1/8	1.125 (28.58)	0.028 (0.71)	0.556	387 (2672)
1 1/8	1.125 (28.58)	0.032 (0.81)	0.632	443 (3057)
1 1/8	1.125 (28.58)	0.035 (0.90)	0.700	494 (3406)
1 1/4	1.250 (31.75)	0.032 (0.81)	0.704	398 (2745)
1 1/4	1.250 (31.75)	0.036 (0.91)	0.789	448 (3092)
1 1/4	1.250 (31.75)	0.048 (1.22)	1.047	606 (4175)
1 3/8	1.375 (34.93)	0.032 (0.81)	0.776	361 (2491)
1 3/8	1.375 (34.93)	0.036 (0.91)	0.870	407 (2805)
1 5/8	1.625 (41.28)	0.036 (0.91)	1.032	343 (2365)
2 1/8	2.125 (53.98)	0.036 (0.91)	1.357	261 (1801)
2 5/8	2.625 (66.68)	0.048 (1.22)	2.244	284 (1957)
3 1/8	3.125 (79.38)	0.072 (1.83)	3.988	359 (2476)

Note : Tubes are supplied in 5.8 meter for annealed Coil copper tubes



t : Thickness
d : Diameter
D : Diameter + Thickness



Toyooda® SEAMLESS COPPER TUBE

ASTM B 88

For : Domestic Water Service and Distribution, Plumbing, Fire Protection, Solar, Fuel/Fuel Oil, HVAC, Snow Melt, Natural Gas and LP Gas.

	Nominal Size, Inch	Dimensions			*Safe Working Internal Pressures				Nominal Weight, Kilograms per Metre
		Actual (Inch)		Wall Thickness Inch (mm)	Hard Drawn				
		Outside Diameter	Diameter		PSI		KPa		
					150°F	300°F	150°F	300°F	
TYPE K	1/4	0.375	3/8	0.035 (0.89)	1612	1558	11112	10740	0.216
	3/8	0.500	1/2	0.049 (1.24)	1695	1638	11684	11292	0.400
	1/2	0.625	5/8	0.049 (1.24)	1337	1293	9216	8913	0.512
	5/8	0.750	3/4	0.049 (1.24)	1104	1067	7610	7355	0.623
	3/4	0.875	7/8	0.065 (1.65)	1278	1236	8809	8520	0.955
	1	1.125	1 1/8	0.065 (1.65)	982	949	6769	6542	1.249
	1 1/4	1.375	1 3/8	0.065 (1.65)	797	771	5494	5315	1.544
	1 1/2	1.625	1 5/8	0.072 (1.83)	742	717	5115	4943	2.028
	2	2.125	2 1/8	0.083 (2.11)	652	630	4494	4343	3.074
	2 1/2	2.625	2 5/8	0.095 (2.41)	597	577	4115	3978	4.359
	3	3.125	3 1/8	0.109 (2.77)	578	559	3984	3854	5.962
	3 1/2	3.625	3 5/8	0.120 (3.05)	549	530	3784	3654	7.628
	4	4.125	4 1/8	0.134 (3.40)	540	522	3722	3598	9.699
	5	5.125	5 1/8	0.160 (4.06)	517	500	3564	3447	14.407
6	6.125	6 1/8	0.192 (4.88)	520	502	3584	3461	20.659	
8	8.125	8 1/8	0.271 (6.88)	553	535	3812	3688	38.600	

Note : Tubes are supplied in 5.8 meter for straight length

TYPE L	1/4	0.375	3/8	0.030 (0.76)	1367	1322	9423	9113	0.188
	3/8	0.500	1/2	0.035 (0.89)	1168	1129	8051	7783	0.295
	1/2	0.625	5/8	0.040 (1.02)	1082	1046	7458	7211	0.425
	5/8	0.750	3/4	0.042 (1.07)	947	916	6528	6315	0.539
	3/4	0.875	7/8	0.045 (1.14)	873	844	6018	5818	0.667
	1	1.125	1 1/8	0.050 (1.27)	741	717	5108	4943	0.975
	1 1/4	1.375	1 3/8	0.055 (1.40)	658	636	4536	4384	1.317
	1 1/2	1.625	1 5/8	0.060 (1.52)	613	592	4226	4081	1.703
	2	2.125	2 1/8	0.070 (1.78)	545	527	3757	3633	2.609
	2 1/2	2.625	2 5/8	0.080 (2.03)	504	487	3474	3357	3.692
	3	3.125	3 1/8	0.090 (2.29)	476	460	3281	3171	4.954
	3 1/2	3.625	3 5/8	0.100 (2.54)	455	440	3136	3033	6.393
	4	4.125	4 1/8	0.110 (2.79)	440	425	3033	2930	8.010
	5	5.125	5 1/8	0.125 (3.18)	404	390	2785	2689	11.353
6	6.125	6 1/8	0.140 (3.56)	376	364	2592	2509	15.196	
8	8.125	8 1/8	0.200 (5.08)	406	392	2799	2702	28.745	

Note : Tubes are supplied in 5.8 meter for straight length

TYPE M	3/8	0.500	1/2	0.025 (0.64)	855	827	5894	5701	0.215
	1/2	0.625	5/8	0.028 (0.71)	741	716	5108	4936	0.303
	3/4	0.875	7/8	0.032 (0.81)	611	590	4212	4067	0.489
	1	1.125	1 1/8	0.035 (0.89)	506	489	3488	3371	0.692
	1 1/4	1.375	1 3/8	0.042 (1.07)	507	490	3495	3378	1.015
	1 1/2	1.625	1 5/8	0.049 (1.24)	497	480	3426	3309	1.400
	2	2.125	2 1/8	0.058 (1.47)	448	433	2088	2985	2.174
	2 1/2	2.625	2 5/8	0.065 (1.65)	411	397	2833	2737	3.018
	3	3.125	3 1/8	0.072 (1.83)	380	367	2619	2530	3.986
	3 1/2	3.625	3 5/8	0.083 (2.11)	378	366	2606	2523	5.332
	4	4.125	4 1/8	0.095 (2.41)	377	364	2599	2509	6.943
	5	5.125	5 1/8	0.109 (2.77)	349	338	2406	2330	9.915
	6	6.125	6 1/8	0.122 (3.10)	328	317	2261	2185	13.282
	8	8.125	8 1/8	0.170 (4.32)	344	332	2371	2289	24.525

Note : Tubes are supplied in 5.8 meter for straight length

Technical Data

ASTM B280 Annealed Coil Copper and Insulation Tube



TOYODA
PRE INSULATED PAIRED
COPPER COIL

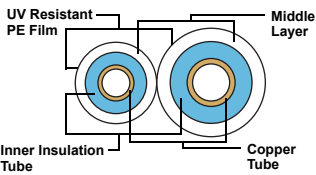
Type	Copper Tube (OD x mm)		Insulation (mm)	Length (m)
	Size	Thickness	Wall Thickness	
TY 2320	1/4" x 0.76		10	20
	3/8" x 0.81		10	
TY 2420	1/4" x 0.76		10	
	1/2" x 0.81		13	
TY 2520	1/4" x 0.76		10	
	5/8" x 0.89		13	
TY 3520	3/8" x 0.81		10	
	5/8" x 0.89		13	
TY 3620	3/8" x 0.81		10	
	3/4" x 0.89		13	
TY 4620	1/2" x 0.81		13	
	3/4" x 0.89		13	

ASTM B280 Single Annealed Coil Copper and Insulation Tube

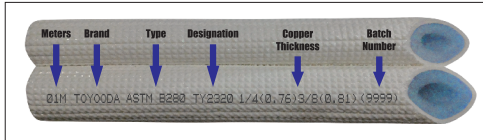
Type	Copper Tube (OD x mm)		Insulation Size (mm)	Length (m)
	Size	Thickness	Wall Thickness	
TS 220	1/4" x 0.76		10	20
TS 320	3/8" x 0.81		10	
TS 420	1/2" x 0.81		13	
TS 520	5/8" x 0.89		13	
TS 620	3/4" x 0.89		13	

ASTM B280 Straight Length Copper and Insulation Tube

Type	Copper Tube (OD x mm)		Insulation (mm)	Length (m)
	Size	Thickness	Wall Thickness	
TY 358 B	3/8" x 0.76		10	5.8
TY 458 B	1/2" x 0.89		13	
TY 558 B	5/8" x 1.02		13	
TY 658 B	3/4" x 1.07		13	
TY 758 B	7/8" x 1.14		13	
TY 958 B	1 1/8" x 1.27		13	
TY 1158 B	1 3/8" x 1.40		13	
TY 1358 B	1 5/8" x 1.52		13	



Ink mark on the insulation ASTM B280



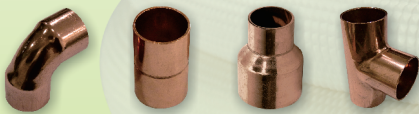
Three (3) Layers Insulation with seamless inner tube, covered with second layer produced by radiation cross-linked. Outside embossed anti UV Film which has better lifetime and weather durable.

INSULATED TUBE PRODUCE ACCORDING TO JIS A9511 2009A- PE-C-2 STANDARD

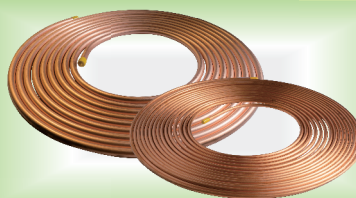
DESCRIPTION	TYPE	DESIGNATION	THERMAL CONDUCTIVITY (Average Temperature 20-5°C) (W/m.K (Kcal/m.h.°C))	WORKING TEMPERATURE °C	TENSILE STRENGTH (N/cm² (Kg/cm²))	WATER ABSORPTION RATE (g/100cm²)	RADIAL CONTRACTION RATE (120±5°C)%
Physical Cross-Linked, 30 times PE Foaming pipe with outer cover	2	A-PE-C-2	≤ 0.043 (0.037)	-70 to 120	>14	≤ 2.0	≤ 7

Refrigerants | Temperature - pressure data for common refrigerants

Also Available Fittings :



Refrigerant type	Refrigerant saturated vapour pressures, Psi (kPa)						
	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C	75 °C
R134a	153 (1054)	179 (1234)	201 (1383)	228 (1571)	260 (1789)	293 (2016)	343 (2364)
R22	239 (1649)	269 (1855)	304 (2095)	340 (2345)	376 (2592)	420 (2895)	480 (3305)
R407C	252 (1735)	286 (1970)	324 (2235)	366 (2520)	426 (2933)	473 (3262)	548 (3776)
R410A	379 (2613)	427 (2945)	480 (3308)	537 (3702)	600 (4131)	-	-
R32	379 (2690)	440 (3028)	495 (3407)	555 (3820)	620 (4268)	692 (4763)	



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