



Copper Tube



AIR CONDITIONING
& REFRIGERATION
COPPER TUBE
AS/NZS 1571
ASTM B280
BSEN 12735

www.kembla.com.au



Copper Tube

MM Kembla has been providing our customers with the highest quality and most reliable products and services for over 100 years. Established in 1916, MM Kembla is Australia's only copper tube manufacturer. Still operating from its original site at Port Kembla, NSW Australia, MM Kembla remains the most highly regarded supplier of copper products including tube, fittings and accessories. Extensive technical knowledge combined with stringent in-house quality controls and testing with an ISO 9001 certified quality management system, MM Kembla has developed a renowned reputation for quality, reliability and service.



AIR CONDITIONING & REFRIGERATION TUBE

KEMBLA® copper tube is manufactured to a variety of international standards, including Australian, New Zealand, British/European and American, and is suitable for different applications such as plumbing, air conditioning, refrigeration, medical gas, and general engineering applications.

Included in the KEMBLA® ranges are the three International Standards for air conditioning and refrigeration grade tubes, which have different internal cleanliness specifications:

- **Australian/New Zealand Standard AS/NZS 1571**
(max. total residue shall not exceed 0.038g/m²)
- **American Standard ASTM B280**
(max. total residue shall not exceed 0.038g/m²)
- **European Standard EN 12735-1**
(max. total carbon residue shall not exceed 0.02g/m²)

All KEMBLA® tubes are guaranteed to comply with each of these relevant Standards and Test Certificates are provided for all products upon request. After cleaning, all tubes are individually end-capped to maintain their internal cleanliness. All straight tubes are manufactured in 5.8m lengths for ease of containerisation and are bundled and wrapped in plastic for maximum protection. Individual coils are also wrapped in plastic, packed into cardboard cartons and palletized for delivery.

Included in some ranges are products suitable for high-pressure refrigerants such as R410A and R32, which are ozone friendly refrigerants. These tubes are identified and protected with pink caps to designate they are "high pressure refrigerant tubes". R410A for example has a 60% higher operating pressure than

R22 and requires a thicker wall tube and significantly stronger copper fittings. 15% silver solder is recommended when brazing tube for use with R410A or other high pressure refrigerants.

Tubes are available from 6.35mm (1/4") to 104.78mm (4-1/8") diameter in various wall thicknesses depending on the Standard, as shown in the following tables.

REFRIGERATION FITTINGS TO AMERICAN STANDARD ASME B16.22

KEMBLA® fittings are marketed under the famous KEMBLA® and K Tick brand marks. The ASME B16.22 range of fittings is available to suit all KEMBLA® air conditioning and refrigeration grade tubes, and are stocked in various Kembla warehouse locations throughout Australia, New Zealand and South East Asia.

Each fitting is permanently marked with the KEMBLA® or K Tick brand mark and are individually cleaned, bagged and labeled to fully comply with the cleanliness requirements of AS/NZS 1571, ASTM 8280 and EN 12735-1. Refer to the KEMBLA 'Refrigeration Fittings Range' brochure on our web site.





Copper Tube TO ASTM B280

KEMBLA® COPPER TUBE TO AMERICAN STANDARD ASTM B280

PRODUCT CODE	STANDARD SIZE (inch)	ACTUAL (inch)		ACTUAL (mm)		WEIGHT (kg/length)	SAFE WORKING PRESSURE (kPa)#		LENGTHS/ BUNDLE
		O.D.	W.T.	O.D.	W.T.		50°C	70°C	
T51420	1/4"	1/4"	0.030	6.35	0.76	0.69	9,900	8,450	100
T51420	3/8"	3/8"	0.030	9.52	0.76	1.09	6,350	5,420	100
T21688	1/2"	1/2"	0.035	12.70	0.89	1.71	5,520	4,710	100
T21173	5/8"	5/8"	0.040	15.88	1.02	2.47	5,030	4,290	100
T15123	3/4"	3/4"	0.042	19.05	1.07	3.14	4,370	3,730	100
T24453	7/8"	7/8"	0.045	22.22	1.14	3.92	3,970	3,390	100
T62952	1-1/8"	1-1/8"	0.050	28.58	1.27	5.65	3,420	2,920	50
T82010	1-3/8"	1-3/8"	0.055	34.92	1.40	7.65	3,070	2,620	50
T13546	1-5/8"	1-5/8"	0.060	41.28	1.52	9.85	2,810	2,400	25
T25513	2-1/8"	2-1/8"	0.070	53.98	1.78	15.14	2,510	2,140	25
T76024	2-5/8"	2-5/8"	0.080	66.68	2.03	21.39	2,310	1,970	25
T81260	3-1/8"	3-1/8"	0.090	79.38	2.29	28.77	2,190	1,870	20
T22196	4-1/8"	4-1/8"	0.110	104.78	2.79	46.38	2,010	1,720	10

KEMBLA® ANNEALED COILS TO AMERICAN STANDARD ASTM B280

PRODUCT CODE	STANDARD SIZE (inch)	ACTUAL (inch)		ACTUAL (mm)		WEIGHT (kg/Coil)	SAFE WORKING PRESSURE (kPa)#		COILS/ CARTON	COILS/ PALLET
		O.D.	W.T.	O.D.	W.T.		50°C	70°C		
T59420	1/4"	1/4"	0.030	6.35	0.76	1.79	9,830	8,400	13	468
T58122	5/16"	5/16"	0.032	7.94	0.81	2.43	8,300	7,090	5	160
T32773	3/8"	3/8"	0.032	9.52	0.81	2.97	6,810	5,810	8	320
T33016	1/2"	1/2"	0.032	12.70	0.81	4.06	5,000	4,270	6	240
T33121	5/8"	5/8"	0.035	15.88	0.89	5.62	4,240	3,620	5	200
T33300	3/4"	3/4"	0.035	19.05	0.89	6.81	3,500	2,990	4	128
T21100	7/8"	7/8"	0.045	22.22	1.14	10.13	3,990	3,400	3	132

Safe Working Pressures are based on annealed temper

REFRIGERANT PRESSURE-TEMPERATURE CHART

The following table is a comparison of operating pressures for the most common refrigerants and can be used for determining which copper tube size is required. This is a guide only and the refrigerant manufacturer should be consulted for more specific information.

Refrigerant	Saturated Vapour Pressures (kPa)						
	-40°C	-20°C	0°C	20°C	40°C	60°C	70°C
R22	5	145	397	810	1,433	2,326	2,884
R32	76	304	712	1,374	2,377	3,831	4,776
R134a	-47	39	192	469	915	1,581	2,016
R404A	26	195	498	989	1,729	2,789	
R407C	19	179	467	936	1,648	2,668	3,318
R410A	76	303	704	1,353	2,336	3,749	4,631
R438A	12	162	432	873	1,539	2,495	3,104
R507	40	216	525	1,024	1,778	2,859	3,554
R744 (CO2)	904	1,869	3,384	5,625	7,106 (@30°C)		



TECHNICAL SUPPORT

MM Kembla is renowned as one of the world's leading experts for technical support regarding copper tube and fittings. We invite hydraulic consultants, engineers, distributors and installation contractors to visit our website where we provide a comprehensive range of technical information.



Copper Tube TO AS/NZS 1571

KEMBLA® COPPER TUBE TO AUSTRALIAN/NEW ZEALAND STANDARD AS/NZS 1571

OUTSIDE DIAMETER (mm)	ACTUAL TUBE SIZE		WEIGHT (kg/m)	SAFE WORKING PRESSURE (kPa)#		STRAIGHT LENGTH (5.8m)	STRAIGHT LENGTH (6.0m)	LENGTHS/ BUNDLE	PRODUCT DETAILS			
	WALL THICKNESS (inches)	X THICKNESS		50°C	70°C				ANNEALED COILS	COIL LENGTH (m)	COILS/ CARTON	COILS PALLET
4.76	0.71	3/16" x 22swg	0.081	12,715	10,854				T32263	30	5	135
6.35	0.56	1/4" x 24swg	0.091	7,069	6,035				T32458	15	13	468
6.35	0.61	1/4" x 23swg	0.098	7,760	6,625				T95105	15	13	468
6.35	0.71	1/4" x 22swg	0.113	9,175	7,832				T32780	15	13	468
6.35	0.81	1/4" x 21swg	0.126	10,635	9,078	T51430	T51435	100	T74634	30	5	160
6.35	0.91	1/4" x 20swg	0.139	12,142	10,365	T92028	T92029	100	T32336	30	5	160
7.94	0.91	5/16" x 20swg	0.180	9,431	8,051				T32522	30	5	160
9.52	0.61	3/8" x 23swg	0.153	5,018	4,284				T95120	15	8	320
9.52	0.71	3/8" x 22swg	0.176	5,900	5,037	T92195		100	T55746	15	8	320
9.52	0.81	3/8" x 21swg	0.198	6,800	5,805	T77111	T77112	100	T55743	18	6	240
9.52	0.91	3/8" x 20swg	0.220	7,718	6,589	T56849	T56847	100	T32662	18	6	240
12.70	0.61	1/2" x 23swg	0.207	3,705	3,163				T95130	15	8	224
12.70	0.71	1/2" x 22swg	0.239	4,344	3,709	T16063 *		100	T54139	15	8	224
12.70	0.81	1/2" x 21swg	0.271	4,994	4,263	T10286 *	T10287 *	100	T54133	18	4	184
12.70	0.91	1/2" x 20swg	0.301	5,653	4,825	T22528 *	T22527 *	100	T32930	18	4	184
12.70	1.02	1/2" x 19swg	0.335	6,389	5,454		T57380 *	100				
15.88	0.61	5/8" x 23swg	0.262	2,936	2,507				T95140	15	5	200
15.88	0.71	5/8" x 22swg	0.303	3,438	2,935				T95145	15	5	200
15.88	0.81	5/8" x 21swg	0.343	3,945	3,368				T52076	15	5	200
15.88	0.91	5/8" x 20swg	0.383	4,459	3,807	T24938 *	T24937 *	100	T33090	18	3	132
15.88	1.02	5/8" x 19swg	0.426	5,031	4,295	T16871 *	T16870 *	100	T16850	18	3	132
19.05	0.71	3/4" x 22swg	0.366	2,846	2,430				T95155	15	4	128
19.05	0.91	3/4" x 20swg	0.464	3,684	3,145	T88073 *	T88072 *	100	T33294	18	3	108
19.05	1.02	3/4" x 19swg	0.517	4,152	3,544		T24813 *	100				
19.05	1.14	3/4" x 0.045"	0.574	4,668	3,985	T16856 *	T16855 *	100	T16857	18	2	72
19.05	1.22	3/4" x 18swg	0.611	5,015	4,281				T33243	15	4	128
22.22	0.91	7/8" x 20swg	0.545	3,138	2,679	T13864 *	T13862 *	100	T76198	18	3	132
22.22	1.14	7/8" x 0.045"	0.675	3,970	3,389	T21091 *		100				
22.22	1.22	7/8" x 18swg	0.720	4,263	3,639		T64173 *	100				
22.22	1.40	7/8" x 0.055"	0.819	4,929	4,208	T16861 *	T16860 *	100				
22.22	1.63	7/8" x 16swg	0.943	5,796	4,948		T23515	100				
25.40	0.91	1" x 20swg	0.626	2,732	2,332	T60659	T60658	50				
25.40	1.22	1" x 18swg	0.829	3,705	3,163	T91955	T91952	50				
25.40	1.63	1" x 16swg	1.089	5,026	4,291	T79846	T79850	50				
28.58	0.91	1 1/8" x 20swg	0.708	2,419	2,065	T73973	T73971	50				
28.58	1.22	1 1/8" x 18swg	0.938	3,276	2,797	T91963	T91961	50				
28.58	1.63	1 1/8" x 16swg	1.234	4,437	3,787		T14559	50				
28.58	1.83	1 1/8" x 15swg	1.376	5,014	4,281	T14570		50				
31.75	0.91	1 1/4" x 20swg	0.789	2,171	1,853	T22040	T22039	50				
31.75	1.22	1 1/4" x 18swg	1.047	2,937	2,508	T91979	T21820	50				
31.75	2.03	1 1/4" x 14swg	1.695	5,007	4,274			50				
34.92	0.91	1 3/8" x 20swg	0.870	1,969	1,681	T15239	T15237	50				
34.92	1.22	1 3/8" x 18swg	1.155	2,662	2,272	T91989	T91987	50				
34.92	1.40	1 3/8" x 0.055"	1.319	3,070	2,620	T81876		50				
34.92	1.63	1 3/8" x 16swg	1.525	3,596	3,070	T75974		50				
34.92	2.03	1 3/8" x 14swg	1.876	4,527	3,865	T75981	T75980	50				
38.10	1.22	1 1/2" x 18swg	1.264	2,433	2,077	T91996	T91995	50				
41.28	0.91	1 5/8" x 20swg	1.032	1,660	1,417	T32923	T32921	50				
41.28	1.22	1 5/8" x 18swg	1.373	2,241	1,913	T91793	T91791	25				
41.28	1.63	1 5/8" x 16swg	1.816	3,021	2,579		T83062	25				
41.28	2.41	1 5/8" x 15swg	2.632	4,548	3,882	T16866	T16865	25				
50.80	1.22	2" x 18swg	1.700	1,812	1,546		T94943	25				
53.98	0.91	2 1/8" x 20swg	1.357	1,263	1,078	T78167	T78166	25				
53.98	1.22	2 1/8" x 18swg	1.809	1,703	1,453	T94961	T94960	25				
53.98	1.63	2 1/8" x 16swg	2.398	2,291	1,956	T94950	T94951	25				
53.98	1.78	2 5/8" x 16swg	2.611	2,508	2,141	T76032		25				
53.98	2.64	2 5/8" x 12swg	3.809	3,776	3,223	T61585		25				
63.50	1.22	2 1/2" x 18swg	2.135	1,443	1,232		T89945	25				
66.68	1.22	2 5/8" x 18swg	2.244	1,373	1,172	T31978	T31976	25				
66.68	1.63	2 5/8" x 16swg	2.979	1,845	1,575	T75568	T75566	25				
66.68	2.03	2 5/8" x 14swg	3.688	2,310	1,972	T68985	T68980	25				
76.20	1.63	3" x 16swg	3.416	1,610	1,374		T88013	25				
79.38	2.29	3 1/8" x 0.090"	4.961	2,186	1,866	T20811		20				
101.60	1.63	4" x 16swg	4.579	1,201	1,026	T20924	T20923	10				
104.78	2.79	4 1/8" x 0.110"	7.996	2,013	1,719	T31309		10				

Suitable for R410A and some other high pressure refrigerants

* Straight lengths supplied in half hard temper, otherwise hard drawn # Safe Working Pressures are based on annealed temper

KEMBLA® COPPER TUBE TO EUROPEAN STANDARD EN 12735-1

ACTUAL TUBE SIZE			WEIGHT (kg/m)	SAFE WORKING PRESSURE (kPa)#		STRAIGHT LENGTH (5.8m)	LENGTHS/ BUNDLE	PRODUCT DETAILS			
OUTSIDE DIAMETER (mm)	WALL THICKNESS (inches)	50°C		70°C	ANNEALED COILS			COIL LENGTH (m)	COILS/ CARTON	COILS PALLET	
6.35	0.56	1/4" x 24swg	0.091	7,070	6,030			T32450	15	13	468
6.35	0.61	1/4" x 23swg	0.098	7,760	6,620			T83536	15	13	468
6.35	0.71	1/4" x 22swg	0.113	9,170	7,830	T55967	100	T32430	15	13	468
6.35	0.81	1/4" x 21swg	0.126	10,630	9,080	T51425	100	T74630	15	13	468
6.35	0.91	1/4" x 20swg	0.139	12,140	10,370	T92030	100				
9.52	0.56	3/8" x 24swg	0.141	4,580	3,910			T55255	15	8	320
9.52	0.61	3/8" x 23swg	0.153	5,020	4,280			T86746	15	8	320
9.52	0.71	3/8" x 22swg	0.176	5,900	5,040	T92193	100	T32771	15	8	320
9.52	0.81	3/8" x 21swg	0.198	6,800	5,800	T77113	100	T55746	15	8	320
9.52	0.91	3/8" x 20swg	0.220	7,720	6,590	T56850	100				
12.70	0.56	1/2" x 24swg	0.191	3,390	2,890			T74626	15	8	224
12.70	0.61	1/2" x 23swg	0.207	3,700	3,160			T87420	15	8	224
12.70	0.71	1/2" x 22swg	0.239	4,340	3,710	T16062*	100	T33011	15	8	224
12.70	0.81	1/2" x 21swg	0.271	4,990	4,260	T10285*	100	T54140	15	6	240
12.70	0.91	1/2" x 20swg	0.301	5,650	4,830	T67710	100				
15.88	0.56	5/8" x 24swg	0.241	2,690	2,290			T62253	15	5	200
15.88	0.61	5/8" x 23swg	0.262	2,940	2,510			T91229	15	5	200
15.88	0.71	5/8" x 22swg	0.303	3,440	2,930			T33146	15	5	200
15.88	0.81	5/8" x 21swg	0.343	3,950	3,370			T52081	15	5	200
15.88	0.91	5/8" x 20swg	0.383	4,460	3,810	T24939*	100	T33094	15	5	200
15.88	1.02	5/8" x 19swg	0.426	4,870	4,160	T16875*	100	T16853	15	5	200
19.05	0.71	3/4" x 22swg	0.366	2,850	2,430			T33319	15	4	128
19.05	0.91	3/4" x 20swg	0.464	3,680	3,140	T88074*	100				
19.05	1.14	3/4" x 0.045"	0.574	4,400	3,760	T16854*	100	T16862	15	4	128
22.22	0.91	7/8" x 20swg	0.545	3,140	2,680	T13865*	100				
22.22	1.14	7/8" x 0.045"	0.675	3,740	3,190	T21092*	100				
22.22	1.40	7/8" x 0.055"	0.819	4,640	3,960	T16863*	100				
25.40	0.91	1" x 20swg	0.626	2,730	2,330	T60661	50				
25.40	1.22	1" x 18swg	0.829	3,490	2,980	T91953	50				
25.40	1.63	1" x 16swg	1.089	4,730	4,040	T79851	50				
28.58	0.91	1 1/8" x 20swg	0.708	2,420	2,070	T73974*	50				
28.58	1.22	1 1/8" x 18swg	0.938	3,090	2,640	T14578	50				
28.58	1.83	1 1/8" x 15swg	1.376	4,720	4,030	T14572	50				
34.92	0.91	1 3/8" x 20swg	0.870	1,970	1,680	T15245	50				
34.92	1.07	1 3/8" x 0.042"	1.018	2,190	1,870	T61820	50				
34.92	1.22	1 3/8" x 18swg	1.155	2,510	2,140	T91990	50				
34.92	1.40	1 3/8" x 0.055"	1.319	2,890	2,470	T81877	50				
34.92	2.03	1 3/8" x 14swg	1.876	4,260	3,640	T75983	50				
41.28	1.22	1 5/8" x 18swg	1.373	2,110	1,800	T91794	25				
41.28	1.83	1 5/8" x 15swg	2.029	3,210	2,740	T67212	25				
41.28	2.41	1 5/8" x 15swg	2.632	4,280	3,660	T16867	25				
53.98	1.22	2 1/8" x 18swg	1.809	1,610	1,370	T94963	25				
66.68	1.22	2 5/8" x 18swg	2.244	1,300	1,110	T19828	25				
66.68	1.63	2 5/8" x 16swg	2.979	1,740	1,490	T75569	25				
79.38	2.29	3 1/8" x 0.090"	4.961	2,060	1,760	T20812	20				

Suitable for R410A and some other high pressure refrigerants

* Straight lengths supplied in half hard temper, otherwise hard drawn # Safe Working Pressures are based on annealed temper



PairCoil



PairCoil

KEMBLA® PAIRCOIL TO AS/NZS 1571

MM Kembla supplies Insulated Pair Coils in both a standard white cross linked polyethylene and a fire resistant black nitrile rubber version for high humidity regions. Pair Coils have the benefits of fast and easy installation without the need for gluing and taping of short lengths.

All of the Kembla® copper meets the requirements of R410A and some other high pressure refrigerants and are manufactured to AS/NZS 1571. Refer to the separate brochures on our website for more details.



times change **copper remains**

KEMBLA[®]

COPPER TUBE TO
AMERICAN STANDARD
ASTM B88

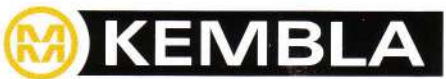


times change copper remains



MM Kembla was established in 1916 at Port Kembla, south of Sydney, in the state of New South Wales, Australia. It was from location that the famous **KEMBLA**® brand originated. The company has been manufacturing copper products on the site since 1918 and first made copper tube there in 1920.

The factory is certified as a Quality Endorsed facility to ISO90012 by SAI Global, as shown by the Certificate of Registratio below. MM Kembla also has a variety of third party accreditations to Australian, British/European and American Standards for many of its product ranges.



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TYPE 'K'

Nominal Size (inch)	ACTUAL (inch)		ACTUAL (mm)		Mass kg / 5.8m	Safe Working Pressure* (kPa)	Lengths per Bundle
	o.d.	w.t.	o.d.	w.t.			
1/4	3/8	0.035	9.52	0.89	1.25	7,397	100
3/8	1/2	0.049	12.70	1.24	2.31	7,751	100
1/2	5/8	0.049	15.88	1.24	2.96	6,106	100
5/8	3/4	0.049	19.05	1.24	3.60	5,040	100
3/4	7/8	0.065	22.22	1.65	5.53	5,790	100
1	1 1/8	0.065	28.58	1.65	7.24	4,445	100
1-1/4	1 3/8	0.065	34.92	1.65	8.95	3,610	50
1-1/2	1 5/8	0.072	41.28	1.83	11.77	3,380	30
2	2 1/8	0.083	53.98	2.11	17.85	2,968	30
2-1/2	2 5/8	0.095	66.68	2.41	25.25	2,739	30
3	3 1/8	0.109	79.38	2.77	34.60	2,642	20
3-1/2	3 5/8	0.120	92.08	3.05	44.27	2,504	20
4	4 1/8	0.134	104.78	3.40	56.20	2,452	10
5	5 1/8	0.160	130.18	4.06	83.49	2,355	8
6	6 1/8	0.192	155.58	4.88	119.90	2,368	5

TYPE 'L'

Nominal Size (inch)	ACTUAL (inch)		ACTUAL (mm)		Mass kg / 5.8m	Safe Working Pressure* (kPa)	Lengths per Bundle
	o.d.	w.t.	o.d.	w.t.			
1/4	3/8	0.030	9.52	0.76	1.08	6,251	100
3/8	1/2	0.035	12.70	0.89	1.71	5,447	100
1/2	5/8	0.040	15.88	1.02	2.47	4,970	100
5/8	3/4	0.042	19.05	1.07	3.14	4,320	100
3/4	7/8	0.045	22.22	1.14	3.92	3,932	100
1	1 1/8	0.050	28.58	1.27	5.66	3,388	100
1-1/4	1 3/8	0.055	34.92	1.40	7.65	3,047	50
1-1/2	1 5/8	0.060	41.28	1.52	9.85	2,791	30
2	2 1/8	0.070	53.98	1.78	15.15	2,493	30
2-1/2	2 5/8	0.080	66.68	2.03	21.40	2,297	30
3	3 1/8	0.090	79.38	2.29	28.78	2,174	20
3-1/2	3 5/8	0.100	92.08	2.54	37.08	2,077	20
4	4 1/8	0.110	104.78	2.79	46.39	2,003	10
5	5 1/8	0.125	130.18	3.18	65.85	1,835	8
6	6 1/8	0.140	155.58	3.56	88.24	1,717	5

TYPE 'M'

Nominal Size (inch)	ACTUAL (inch)		ACTUAL (mm)		Mass kg / 5.8m	Safe Working Pressure* (kPa)	Lengths per Bundle
	o.d.	w.t.	o.d.	w.t.			
1/4	3/8	0.025	9.52	0.64	0.93	5,233	100
3/8	1/2	0.025	12.70	0.64	1.26	3,859	100
1/2	5/8	0.028	15.88	0.71	1.76	3,409	100
5/8	3/4	0.030	19.05	0.76	2.27	3,026	100
3/4	7/8	0.032	22.22	0.81	2.82	2,763	100
1	1 1/8	0.035	28.58	0.89	4.02	2,351	100
1-1/4	1 3/8	0.042	34.92	1.07	5.90	2,312	50
1-1/2	1 5/8	0.049	41.28	1.24	8.10	2,266	30
2	2 1/8	0.058	53.98	1.47	12.59	2,050	30
2-1/2	2 5/8	0.065	66.68	1.65	17.49	1,859	30
3	3 1/8	0.072	79.38	1.83	23.14	1,730	20
3-1/2	3 5/8	0.083	92.08	2.11	30.95	1,719	20
4	4 1/8	0.095	104.78	2.41	40.22	1,726	10
5	5 1/8	0.109	130.18	2.77	57.54	1,595	8
6	6 1/8	0.122	155.58	3.10	77.06	1,492	5

* Safe Working Pressures are based on annealed temper for temperatures up to 50°C

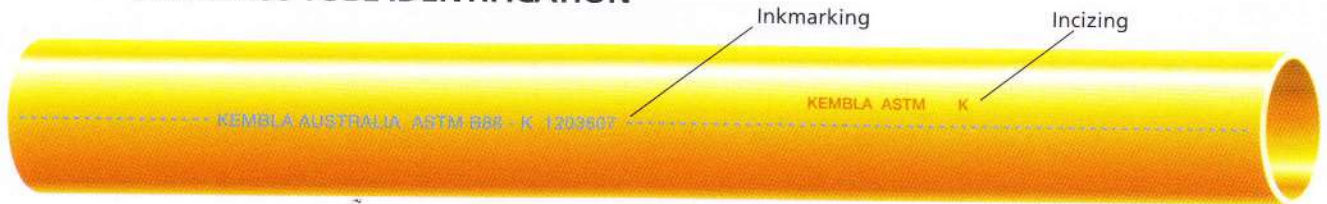
KEMBLA® COPPER TUBE TO AMERICAN STANDARD ASTM B88

MM Kembla is a world class producer and Australia's leading supplier of copper tube and manufactures under the famous **KEMBLA®** brand name. MM Kembla manufactures a comprehensive range of tube and fittings products to comply with a variety of International Standards.

Included in the **KEMBLA®** range is American Standard ASTM B88 copper tube, the specified copper plumbing tube standard used in America and a number of Asian countries.

KEMBLA® copper tube is manufactured to fully conform to ASTM B88 specifications and is available in Types K, L and M in either bare or lagged tube for use in both hot and cold water applications. It is supplied in diameters of 9.52 to 155.58mm (3/8" to 6 1/8") and lengths of 5.8m to facilitate ease of containerisation.

ASTM B88 TUBE IDENTIFICATION



KEMBLA® COPPER FITTINGS TO AMERICAN STANDARD ASME B16.22

MM Kembla is a leading supplier of copper fittings and manufactures under the famous **KEMBLA®** and **K Tick** brand marks. A comprehensive range of copper fittings are manufactured to a variety of applications and International Standards.

KEMBLA® American Standard fittings are manufactured in accordance with ASME B16.22 and are suitable for use with ASTM B88 copper tube.

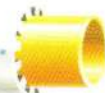
PLASTIC COVERED COPPER TUBE

MM Kembla has developed **Kemlag Plus** and **Kemline Plus** pre-insulated copper tube for a range of plumbing applications. The products consist of tube encapsulated in a tough, solid extruded polyethylene jacket.

This polyethylene sheathed tubing is suitable for use in a variety of applications including; burying in corrosive soils, laying under floors and concrete slabs (where approved), chasing into walls and masonry, exposed or aggressive environments. The covering is coloured white, and is all Low Smoke Halogen Free (LSHF). This insulation will soften at elevated temperatures and the product should not be used for installations operating continuously at temperatures above 90°C.

Kemlag Plus® insulation is internally profiled to entrap air and provide a thermal barrier. It is suitable for both hot and cold water plumbing and is useful in preventing condensation.

..... KEMBLA AUSTRALIA KEMLAG PLUS® COPPER TUBE IS ASTM B88 - L - 1203607



Kemline Plus® has a tough, thin, space-saving covering. The moisture resistant jacket makes the product suitable for cold water applications and where tube may be concealed or exposed to aggressive environments. This tube is also suitable for gas line installations.

..... KEMBLA AUSTRALIA KEMLINE PLUS® COPPER TUBE IS ASTM B88 - L - 2104207





times change **copper remains**

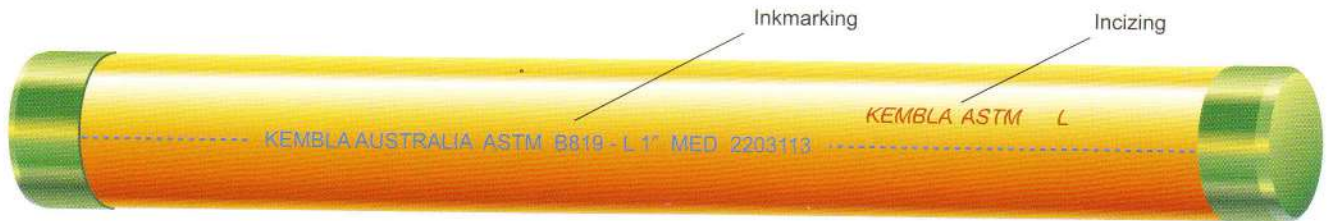
KEMBLA[®]
MEDICAL GAS
COPPER TUBE TO
AMERICAN STANDARD
ASTM B819

 **KEMBLA**



PUBLICATION
L 56/13

MEDICAL GAS TUBE IDENTIFICATION



TYPE 'K'

Nominal Size (inch)	ACTUAL (inch)		ACTUAL (mm)		Mass kg / 5.8m	Safe Working Pressure*(kPa)	Lengths per Bundle
	o.d.	w.t.	o.d.	w.t.			
1/4	3/8	0.035	9.52	0.89	1.25	7,397	100
3/8	1/2	0.049	12.70	1.24	2.31	7,751	100
1/2	5/8	0.049	15.88	1.24	2.96	6,106	100
5/8	3/4	0.049	19.05	1.24	3.60	5,040	100
3/4	7/8	0.065	22.22	1.65	5.53	5,790	100
1	1 1/8	0.065	28.58	1.65	7.24	4,445	100
1-1/4	1 3/8	0.065	34.92	1.65	8.95	3,610	50
1-1/2	1 5/8	0.072	41.28	1.83	11.77	3,380	30
2	2 1/8	0.083	53.98	2.11	17.85	2,968	30
2-1/2	2 5/8	0.095	66.68	2.41	25.25	2,739	30
3	3 1/8	0.109	79.38	2.77	34.60	2,642	20
3-1/2	3 5/8	0.120	92.08	3.05	44.27	2,504	20
4	4 1/8	0.134	104.78	3.40	56.20	2,452	10
5	5 1/8	0.160	130.18	4.06	83.49	2,355	8
6	6 1/8	0.192	155.58	4.88	119.90	2,368	5

TYPE 'L'

Nominal Size (inch)	ACTUAL (inch)		ACTUAL (mm)		Mass kg / 5.8m	Safe Working Pressure*(kPa)	Lengths per Bundle
	o.d.	w.t.	o.d.	w.t.			
1/4	3/8	0.030	9.52	0.76	1.08	6,251	100
3/8	1/2	0.035	12.70	0.89	1.71	5,447	100
1/2	5/8	0.040	15.88	1.02	2.47	4,970	100
5/8	3/4	0.042	19.05	1.07	3.14	4,320	100
3/4	7/8	0.045	22.22	1.14	3.92	3,932	100
1	1 1/8	0.050	28.58	1.27	5.66	3,388	100
1-1/4	1 3/8	0.055	34.92	1.40	7.65	3,047	50
1-1/2	1 5/8	0.060	41.28	1.52	9.85	2,791	30
2	2 1/8	0.070	53.98	1.78	15.15	2,493	30
2-1/2	2 5/8	0.080	66.68	2.03	21.40	2,297	30
3	3 1/8	0.090	79.38	2.29	28.78	2,174	20
3-1/2	3 5/8	0.100	92.08	2.54	37.08	2,077	20
4	4 1/8	0.110	104.78	2.79	46.39	2,003	10
5	5 1/8	0.125	130.18	3.18	65.85	1,835	8
6	6 1/8	0.140	155.58	3.56	88.24	1,717	5

* Safe Working Pressures are based on annealed temper for temperatures up to 50°C
Type M sizes available on request.

KEMBLA® MEDICAL GAS TUBE TO AMERICAN STANDARD ASTM B819

MM Kembla is a world-class producer and Australia's leading supplier of copper tube and manufactures under the famous **KEMBLA®** brand name. MM Kembla manufactures a comprehensive range of copper tube products to comply with a variety of applications and International Standards.

Included in the **KEMBLA®** range is Medical Gas tube manufactured to fully conform to ASTM B819 specifications and is available in outside diameters from 9.52mm to 155.58mm (3/8" to 6 1/8"). Only Types K and L are nominated in the Standard and these specifications are shown in the tables overleaf. MM Kembla holds a StandardsMark Licence for ASTM B819 copper tube for medical gas as shown on our website.

The internal cleanliness of medical gas and oxygen tubes is critical in order to prevent gas contamination and potential explosions. Oxygen under pressure may cause spontaneous combustion of residual organic drawing oils if they remain inside tubes after manufacture. Oils or other contaminants may also cause patients serious respiratory problems if not removed prior to installation. MM Kembla has a unique manufacturing process to ensure that the total internal residue does not exceed 0.038g/m² as specified in ASTM B819. After cleaning, all tubes are individually end-capped to maintain their internal cleanliness, then bundled and wrapped in plastic for maximum protection.

During storage and handling of **KEMBLA®** Medical Gas tube and fittings, particular attention must be given to keeping them clean and dry. When brazing joints, lines should be continuously purged with nitrogen or another appropriate inert gas. Only approved filler metals and fluxes (if required) should be used. After brazing, all joints should be cleaned and inspected visually. Pressure and contaminant testing should be performed on installed tubing before final approval and use of the system.

Test Certificates are supplied with all deliveries for each product. Straight lengths of 5.8m are manufactured for ease of containerisation.

KEMBLA® MEDICAL GAS FITTINGS TO AMERICAN STANDARD ASME B16.22

MM KEMBLA is a leading supplier of a comprehensive range of copper fittings conforming to a variety of applications and International Standards. KEMBLA® fittings are marketed under the famous **KEMBLA®** and **K Tick** brand marks. A full range of fittings is available to suit **KEMBLA®** ASTM B819 Medical Gas tubes.

KEMBLA® Medical Gas fittings are manufactured in accordance with American Standard ASME B16.22 and individually cleaned, bagged and labelled. All bags of fittings are individually marked as suitable for Medical Gas purposes.



Quality
ISO 9001
SAI GLOBAL

Copper Tube

MEDICAL GAS
COPPER TUBE
TO EUROPEAN
STANDARD
BSEN 13348

USAGE

- Medical Gas
- Vacuum Lines

www.kembla.com.au





Copper Tube

MM Kembla has been providing our customers with the highest quality and most reliable products and services for over 100 years. Established in 1916, MM Kembla is Australia's only copper tube manufacturer. Still operating from its original site at Port Kembla, NSW Australia, MM Kembla remains the most highly regarded supplier of copper products including tube, fittings and accessories. Extensive technical knowledge combined with stringent in-house quality controls and testing with an ISO 9001 certified quality management system, MM Kembla has developed a renowned reputation for quality, reliability and service.



MEDICAL GAS TUBE

KEMBLA® copper tube is manufactured to a variety of international standards, and included in the KEMBLA® range is Medical Gas tube manufactured to fully conform to EN 13348 specifications and is available from 8mm to 159mm diameter in the equivalent wall thicknesses of 'Table X'. EN 13348 copper tube is specified throughout Europe, the Middle East and Asia, and is the only copper tube specified in the Health Technical Memorandum 02-01 and ISO 7396-1, which dictate the current best practice for the installation of pipelines for compressed medical gas and vacuum systems.

The internal cleanliness of medical gas and oxygen tubes is critical in order to prevent gas contamination and potential explosions. MM Kembla has a unique manufacturing process to ensure the carbon cleanliness does not exceed 0.02g/m² total carbon, as specified in the Standard for sizes up to 54mm. Sizes over 54mm are not specified in EN 13348 but MM Kembla does supply these to the same internal cleanliness specifications. Tests are conducted by a certified laboratory using the combustion method as stipulated in EN 737. After cleaning, all tubes are individually end-capped to maintain their internal cleanliness, then bundled and wrapped in plastic for maximum protection.

All tubes are certified under a StandardsMark Licence and Test Certificates are provided for each product with all deliveries. Straight lengths of 5.8m are manufactured for ease of containerisation.

MEDICAL GAS FITTINGS

TO EUROPEAN STANDARD EN 1254

MM KEMBLA is a leading supplier of a comprehensive range of copper fittings conforming to a variety of applications and International Standards. KEMBLA® fittings are marketed under the famous KEMBLA® and K Tick brand marks. A full range of fittings is available to suit KEMBLA® EN 13348 Medical Gas tube from 8mm to 159mm.

KEMBLA® Medical Gas fittings are manufactured in accordance with European Standard EN 1254 and individually cleaned, bagged and labeled to fully comply with the cleanliness requirements of EN 13348 and HTM 02-01.

All bags of fittings are individually marked as suitable for Medical Gas purposes.



KEMBLA Copper Tube

KEMBLA® MEDICAL GAS TUBE TO EN 13348

PRODUCT CODE	OUTSIDE DIAMETER (mm)	WALL THICKNESS (mm)	WEIGHT/LENGTH (kg/5.8m)	SAFE WORKING PRESURE*		LENGTHS PER BUNDLE
				ANNEALED (kPa)	AS SUPPLIED (kPa)	
T11850	8.0	0.8	0.94	8,110	13,850	100
T11860	10.0	0.8	1.20	6,360	10,860	100
T11905	12.0	0.8	1.46	5,230	8,940	100
T20944	15.0#	0.7	1.63	3,590	5,440#	100
T14276	22.0#	0.9	3.09	3,130	4,740#	100
T14313	28.0#	0.9	3.98	2,440	3,690#	50
T14216	35.0	1.2	6.61	2,460	4,200	50
T63596	42.0	1.2	7.98	2,040	3,480	50
T21976	54.0	1.2	10.33	1,580	2,700	30
T74049	66.7	1.2	12.81	1,270	2,170	25
T78600	76.1	1.5	18.24	1,400	2,390	20
T64437	108.0	1.5	26.04	980	1,670	10
T84303	133.0	1.5	32.15	790	1,360	10
T13457†	159.0	2.0	51.18	890	1,510	5

* Based on annealed temper after brazing for temperatures of 50°C. # Manufactured in half-hard temper; all other sizes are hard drawn.
† EN 13348 only specifies up to 133mm diameter; 159mm will be supplied as EN1057 cleaned and capped to EN 13348.

PROJECT REFERENCES

HONG KONG

- Hong Kong Adventist Hospital
- Precious Blood Hospital
- Queen Elizabeth Hospital
- North Lantau Island Hospital
- Pamela Youde Nethersole Hospital
- Yan Chai Hospital
- St. Teresa's Hospital
- Matilda International Hospital
- Harbour Building Dental Clinic
- Centro Hospitalar
- Tai Po Maxim's Food Factory
- Uni. of Science and Technology
- Hong Kong Baptist Hospital
- St. Paul Hospital
- Hong Kong Sanatorium & Hospital
- Hong Kong Adventist Hospital
- Tin Shui Wai Hospital
- Gleneagles HK Hospital
- Hong Kong Sanitarium & Hospital

MACAU

- Hospital Conde S. Januário

CHINA

- Nanjing Ming Ji Hospital, Nanjing
- Kiang Wu Hospital, Macau

SINGAPORE

- Alexandra Khoo Teck Puat Hospital
- Tan Tock Seng Hospital
- Novena Hospital
- National University Hospital
- Farrer Park Hospital
- National Heart Hospital
- Assisi Hospital
- Yishun Community Hospital
- Singapore General Hospital
- Changi General Hospital
- St. Luke Hospital
- Life Science Centre

MALAYSIA

- Petronas Hospital, Kuala Lumpur (KL)
- Ipoh Specialist Hospital, Ipoh Perak
- Tung Shin Hospital, KL

- Hospital Cancer, Nilai Hospital Army, KL
- Hospital Terangganu Wad I.C.U., Kuala Terangganu
- Columbia Asia Medical Centres in many locations
- Hospital Jantung, KL
- Hospital Hemodialysis, Seremban
- Hospital Sultan Aminah, Johor
- Seremban Specialist Hospital, Seremban
- Hospital Tropicana, KL
- Likas Medical Centre, Sabah
- Shah Alam Hospital

INDONESIA

- Gambiran Hospital, Surabaya
- Nganjuk RSUD Hospital, Surabaya
- SOA RSUD Hospital, Surabaya
- A.W Sjahrane RSUD Hospital, Samarinda

CAMBODIA

- Maternal Hospital
- Calmette Hospital

- Sunrise Hospital
- Russian Hospital

VIETNAM

- Nam Dinh General Hospital, Nam Dinh
- Dong Da General Hospital
- Hanoi Obstetrics Hospital
- National Pediatric Hospital
- Bac Ninh General Hospital
- 221 Army Hospital
- Lang Son General Hospital
- Hoa Binh General Provincial Hospital
- Phuong Chau International Hospital
- Binh Dinh General Hospital
- Cua Dong Hospital, Vinh City
- Ha Giang General Hospital
- Bia Chay General Hospital

JORDAN

- Jabal Al Zaitoon Hospital, Zarqa
- Princess Basma Hospital,
- Irbid Italian Hospital, Amman

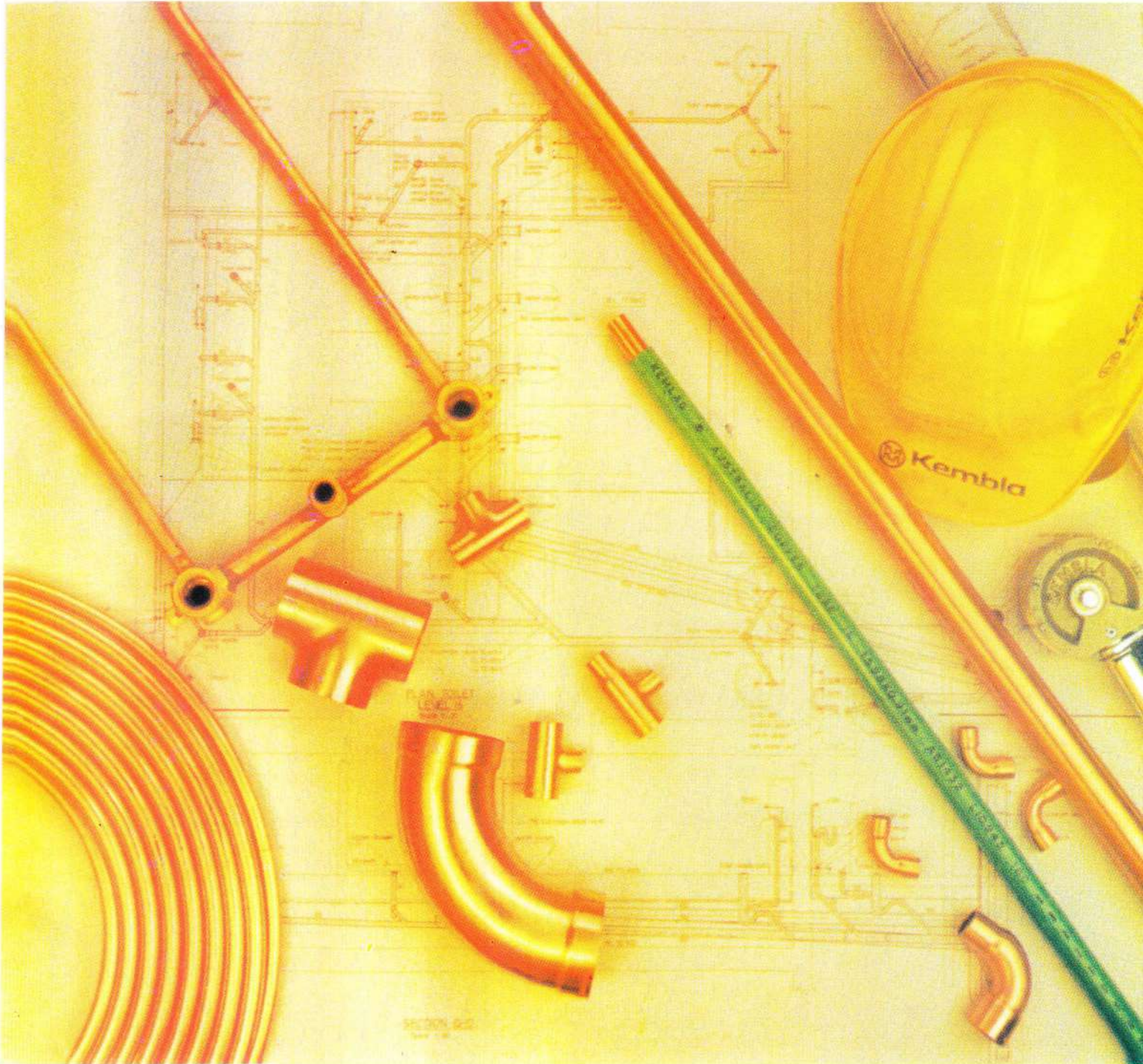


TECHNICAL SUPPORT

MM Kembla is renowned as one of the world's leading experts for technical support regarding copper tube and fittings. We invite hydraulic consultants, engineers, distributors and installation contractors to visit our website where we provide a comprehensive range of technical information.

PUBLICATION E20/00

 **KEMBLA**
TUBE & FITTINGS



**COPPER TUBE FOR WATER, GAS, SANITATION,
AIR CONDITIONING, REFRIGERATION, FIRE
PROTECTION AND GENERAL PURPOSES.**

**AMERICAN STANDARD ASTM B 280 SEAMLESS
COPPER TUBE FOR AIR CONDITIONING
AND REFRIGERATION FIELD SERVICE**

Chemical composition

All tubing is manufactured from phosphorus deoxidised copper high residual phosphorus complying with UNS C12200

ELEMENT	% MINIMUM	% MAXIMUM
Copper ¹	99.9	-
Phosphorus	0.015	0.040

¹ Including Silver

Temper

TEMPER	TUBE FORM	TENSILE STRENGTH MPa	ELONGATION % MINIMUM
060 - soft anneal	coils	205	40
H58 - drawn	straights	250	-

Dimensions and tolerances

Tubing to this specification is supplied in standard imperial (inch) sizes with dimensions in accordance with Table A (coils) or Table B (straights)

Table A. Coiled Tube 50ft (15.24m)

Dimensions in inches. Millimetre equivalents are shown in parentheses.

STANDARD SIZE	OUTSIDE DIAMETER				WALL THICKNESS			
	ACTUAL		TOLERANCE (±)		ACTUAL		TOLERANCE (±)	
1/4	0.250	(6.35)	0.002	(0.051)	0.030	(0.762)	0.003	(0.08)
5/16	0.312	(7.94)	0.002	(0.051)	0.032	(0.813)	0.003	(0.08)
3/8	0.375	(9.52)	0.002	(0.051)	0.032	(0.813)	0.003	(0.08)
1/2	0.500	(12.70)	0.002	(0.051)	0.032	(0.813)	0.003	(0.08)
5/8	0.625	(15.88)	0.002	(0.051)	0.035	(0.889)	0.004	(0.10)
3/4	0.750	(19.05)	0.0025	(0.064)	0.035	(0.889)	0.004	(0.10)
3/4	0.750	(19.05)	0.0025	(0.064)	0.042	(1.070)	0.004	(0.10)
7/8	0.875	(22.22)	0.003	(0.076)	0.045	(1.140)	0.004	(0.10)

Note:

- The outside diameter tolerance is the average of the maximum and minimum outside diameters as determined at any one cross-section of the tube.
- Wall thickness tolerances are maximum deviation at any point.

Table B. Straight length tube, drawn temper only

20ft lengths (6.096m)

Dimensions in inches. Millimetre equivalents are shown in parentheses.

STANDARD SIZE	OUTSIDE DIAMETER				WALL THICKNESS			
	ACTUAL		TOLERANCE (±)		ACTUAL		TOLERANCE (±)	
3/8	0.375	(9.52)	0.001	(0.025)	0.030	(0.76)	0.003	(0.08)
1/2	0.500	(12.70)	0.001	(0.025)	0.035	(0.89)	0.004	(0.10)
5/8	0.625	(15.88)	0.001	(0.025)	0.040	(1.02)	0.004	(0.10)
3/4	0.750	(19.05)	0.001	(0.025)	0.042	(1.07)	0.004	(0.10)
7/8	0.875	(22.22)	0.001	(0.025)	0.045	(1.14)	0.004	(0.10)
1 1/8	1.125	(28.58)	0.0015	(0.038)	0.050	(1.27)	0.005	(0.13)
1 3/8	1.375	(34.92)	0.0015	(0.038)	0.055	(1.40)	0.006	(0.15)
1 5/8	1.625	(41.28)	0.002	(0.051)	0.060	(1.52)	0.006	(0.15)
2 1/8	2.125	(53.98)	0.002	(0.051)	0.070	(1.78)	0.007	(0.18)
2 5/8	2.625	(66.68)	0.002	(0.051)	0.080	(2.03)	0.008	(0.20)
3 1/8	3.125	(79.38)	0.002	(0.051)	0.090	(2.29)	0.009	(0.23)
3 5/8	3.625	(92.08)	0.002	(0.051)	0.100	(2.54)	0.010	(0.25)
4 1/8	4.125	(104.78)	0.002	(0.051)	0.110	(2.79)	0.011	(0.28)

Note:

- The outside diameter tolerance is the average of the maximum and minimum outside diameters as determined at any one cross-section of the tube.
- Wall thickness tolerances are maximum deviation at any point.

Cleanliness

Tube is processed to meet a maximum internal surface residue limit of 0.0035 g/ft² (0.038 g/m²), as required by the standard, and is supplied sealed to prevent ingress of dirt and moisture.

PAIR COIL SPECIFICATIONS SUITABLE FOR HIGH PRESSURE REFRIGERATION

Kembla product code	Copper tube outside diameter x wall thickness (mm)	Copper tube outside diameter (inches)	Pair coil length (m)	Pair coils per carton	Carton dimensions (cm)	Weight per coil (kg)
T99515	6.35 x 0.76 - 9.52 x 0.81	1/4 - 3/8	15	1	55 x 55 x 18	5.8
T99525	6.35 x 0.76 - 12.70 x 0.81	1/4 - 1/2	15	1	58 x 58 x 18	6.8
T99535	6.35 x 0.76 - 15.88 x 0.89	1/4 - 5/8	15	1	73 x 73 x 18	8.4
T99545	9.52 x 0.81 - 12.70 x 0.81	3/8 - 1/2	15	1	73 x 73 x 18	8.0
T99555	9.52 x 0.81 - 15.88 x 0.89	3/8 - 5/8	15	1	77 x 77 x 23	9.5
T99565	9.52 x 0.81 - 19.05 x 0.89	3/8 - 3/4	15	1	80 x 80 x 23	10.7
T99575	12.70 x 0.81 - 19.05 x 0.89	1/2 - 3/4	15	1	82 x 82 x 23	11.8

INSULATION PROPERTIES IN ACCORDANCE WITH JIS A9511 & KSM 3862

Thermal conductivity	Tensile strength	Water absorption	Thickness shrinkage percentage	Coefficient of moisture permeability
W/m·K mean temperature 20°C	N/cm ² (kgf/cm ²)	g/100cm ²	@(120 ± 5°C)	(per 25mm in thickness) ng/m ² ·s·Pa (g/m ² ·h·mmHg)
0.037	34.2 (3.49)min	0.0076 max	5% max	10 (0.005) max

COPPER TUBE SAFE WORKING PRESSURE (kPa)

Actual tube size Metric (mm)	SWP (kPa)	
	@50°C	@75°C
6.35 x 0.76	8,833	7,325
9.52 x 0.81	6,279	5,207
12.70 x 0.81	4,707	3,903
15.88 x 0.89	4,136	3,430
19.05 x 0.89	3,448	2,859

Recommended maximum operating temperature is 65°C and in accordance with AS1677.

A/C manufacturers' operating and installation instructions should be consulted.

CAUTION: Product data, design details, performance figures, advice and other information given herein (the "Information") is provided only as a guide to available information. Metal Manufactures does not accept any liability whatsoever (including arising from negligence) for the accuracy of the Information and for injuries, expense or loss, which may arise as a result of the use of the Information by the recipient.

KEMBLA

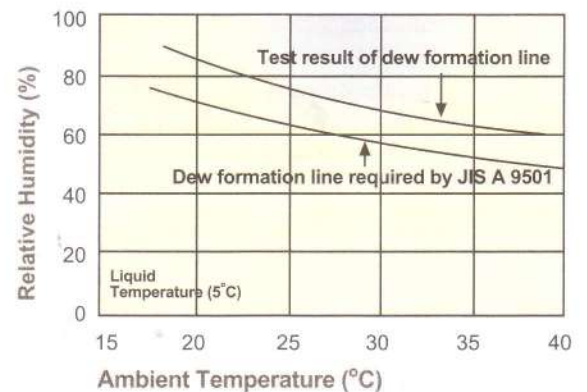
PAIR COIL

REFRIGERANT WORKING PRESSURE (kPa)

Refrigerant type	Refrigerant Saturated Vapour Pressure (kPa)				
	@50°C	@55°C	@60°C	@65°C	@70°C
R22	1,855	2,095	2,345	2,592	2,895
R134a	1,234	1,383	1,571	1,789	2,016
R404A	2,224	2,503	2,805	3,093	-
R407C	1,777	2,025	2,297	2,595	-
R410A*	2,945	3,308	3,702	4,131	-
R507A	1,977	2,215	2,475	2,865	3,090

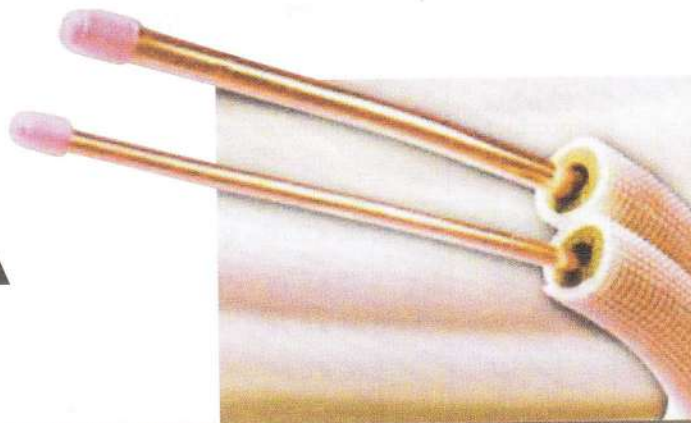
*Change in flaring dimension for R410A. For details refer to airconditioner manufacturers specifications.

Dew Point Graph



KEMBLA

PAIR COIL



Pre-installed annealed copper pair coils for split system airconditioners

USE PINK
no need to think



BENEFITS:

Save time and money:

Install your pipework in less than half the time with pre-insulated annealed copper pair coils in 1/4" (6.35mm) to 3/4" (19.05mm) sizes.

No glue, no tape and no messy powder:

Continuous 20m coil lengths means eliminating the need to seal joints every two metres, saving even more time.

Easy to install:

The exterior film is stronger and more resistant to abrasion than traditional materials, and can be easily pushed through tight spaces without being caught or torn.

Easy to transport:

The 20m coils are packed in cardboard cartons and are easily transported.



FEATURES:

Quality insulation:

Tube insulation is manufactured from cross-linked, foamed, closed cell polyethylene film. The exterior embossed polyethylene film contains an additive to improve UV protection. Insulation is heat resistant to 120 C and has superior dew-point characteristics.



INSTALLATION:

Joining:

Kembla Pair Coil copper tube is recommended to be flare jointed. If brazing is necessary, all safety precautions should apply. Refer to installation instruction included with each Kembla Pair Coil carton.

Bending:

If tight bending is required, the insulation can be cut back to accommodate a tube bender. Alternatively a length of polyethylene tube can be inserted to prevent kinking.

RECOMMENDED FOR

- Split system air conditioners
- General Airconditioning and refrigeration installations
- All sizes suitable for R410A refrigerant as shown by pink end-caps



Quality
Endorsed
Company

ISO 9001 Lic 0002/01
SAI Global

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