CAMBRIDGE-LEE INDUSTRIES, INC.

Your worldwide supply partner

Leading manufacturer
of copper tube in the USA,
México and Latin America.

COPPER TUBE

CAMBRIDGE-LEE INDUSTRIES, INC.

IUSA and Cambridge-Lee Industries: Leading the Way with Quality and Service

Cambridge-Lee Industries entered the copper tube industry in 1955 as a small distributor serving the U.S. plumbing market. Over the years, the company has evolved into one of the world's largest distributors of copper with sales offices in every corner of the globe.

During 1993, Industrias Unidas S.A. de C.V. (IUSA), one of Mexico's largest conglomerates, acquired Cambridge-Lee. IUSA has a modern, state-of-art copper refinery and tube mill in Pasteje Mexico. In 1996, Cambridge-Lee purchased Reading Tube Corporation, a major U.S. producer of copper tube. As a result of the merger and acquisition, Cambridge-Lee has become one of the world's leaders in the manufacture and distribution of copper tube for water supply, air conditioning, refrigeration and a variety of commercial applications.

Cambridge-Lee has grown to be a world leader because we understand that customer satisfaction requires not only quality products but also a high level of service. Our employees take pride in ensuring we meet our customer needs and requirements: from on-time deliveries, to well-trained sales and service departments, to utmost product quality.

Commitment to Quality

Cambridge-Lee implements strict testing methods and controls to ensure that the highest quality tube reaches our customers. From the selection of raw materials to final packaging, our tube is continually tested and inspected at all stages in the manufacturing process to ensure problems and defects are detected and solved at their source.

Another step in our ongoing commitment to provide the highest level of product quality, exceptional customer and technical service is that both our production facilities have achieved ISO 9001:2000 Certification – the international standard for assured product quality. This achievement along with our dedication to you is the driving force that paved the way for and has earned us the reputation as a world- class industry leader.

Copper Tube Product Range

We also manufacture copper tube products for use in refrigeration, air-conditioning and commercial industries.

Product	Application	Temper	Ink Color Marking	Standards
DWV Tube	Drainage	Hard	Yellow	ASTM B306
Water Tube Type M	Domestic Water Service Fire Protection Solar, Fuel Oil HVAC	Drawn	Red	ASTM B-88
Water Tube Type L	Domestic Water Service Fire Protection Solar, Fuel Oil HVAC, Natural Gas	Drawn Annealed	Blue N/A	ASTM B-88
Water Tube Type K	Domestic Water Service Fire Protection Solar, Fuel Oil HVAC	Drawn Annealed	Green N/A	ASTM B-88
Refrigeration Tube	Air Conditioning Refrigeration Service	Annealed	N/A	ASTM B-280
ACR Tube (L cleaned and capped/degreased)	Air Conditioning Refrigeration Natural Gas	Drawn	Blue	ASTM B-280
OXY/MED Tube (K & L Cleaned and capped/degreased)	Medical Gas Systems	Drawn	(L) Blue (K) Green	ASTM B-280, B-819

Product	Application	Temper	Specifications
Copper Tube	Water and gas in sanitary and heating	Annealed Half Hard Hard	EN 1057
Copper Tube	Air conditioining and refrigeration	Annealed Half Hard Hard	EN 12735-1

Level Wound Coils

A level wound coil from IUSA Cambridge-Lee is a long length of tube that is uniformly and tightly spooled in layers parallel to the axis of the coil. Such coils are used for a wide variety of applications in many industries.

Material

Type DHP (UNS C12200) Copper. This material meets the requirements of ASTM B743, B68 and B75 Standards.

Cleanliness and Appearance

As per requirements of standard ASTM B 280, any residue on the inside of the tube will not exceed 0.0035 gm/ft•'5f (0.038 g/m•'5f). Both the inside and outside diameter surfaces will be clean and bright, with the finish being smooth and free from slivers, scale, open grain and major metal defects such as inclusions. Level wound coils with insignificant surface damage, such as minor dents that will not interfere with the tubing's end use, will be shipped.

Coil Weight

Nominal Weight standards for Cambridge-Lee Level Wound coils are 200 pounds (90 kg) and 264 pounds (120 kg) in reels and 200 pounds (90 kg) to 400 pounds (180 kg) in bulk packaging. In any single shipment, coils with weights that are less than these nominal standards - and as low as 100 pounds (40.82 kg) - will be included on the basis of 80 percent nominal weight and 20 percent lighter weight. Coils with non-standard weights and/or lengths can be supply on special order.

Temper

Soft Anneal - .040 mm Minimum average grain size
Light Anneal - .040 mm Maximum average grain size
Hard Drawn - 36,000 psi (250 Mpa) minimun tensile strength
We can supply special tempers on request.

LWC Mechanical Properties ASTM B 743

Temper Designation		Wall Thickness, in (mm)	Tensile Strength Min, ksi (Mpa)	Yield Strength Min. Ksi (Mpa)	Enlogation in 2 in., Min %	Grain Size
H58	Drawn	0,020 an over (0,508)	36(250)	30 (205)	N/A	N/A
050 Light	Anneal	0,020 to 0,035 (0,508 to 0,889) Over 0,035 (0,889)	30(205) 30(205)	9 (62) 9 (62)	40 40	0,040 mm Max.
060 Soft	Anneal	0,020 to 0,035 (0,508 to 0,889) Over 0,035 (0,889)	30(205) 30(205)	6 (40) 6 (40)	40 40	0,040 mm Min.

Any OD/WT not considered in above table, might be supplied on request.

ACR Copper Tube Technical Data

COILS - ASTM B 280

Nominal or Standard Size, in.	O.D. (in.)		Wall Thickness, in. (Nom.)	Theoretical Weight kg/m Nominal	Theoretical Weight lb/ft Nominal	Rated internal working pressures Hard Drawn 150° F - 56.7° C / 300° F - 113.4° c	Hard Drawn 300°F - 113.4°C S = 10,000 psi	Annealed 150°F - 56.7°C S = 5,100 psi	Annealed 300°F - 113.4°C S = 4,700 psi
1/8	0,125	1/8	0,030	0,0516	0,0347	-	-	2613	2408
3/16	0,187	1/5	0,030	0,0854	0,0575	-	-	1645	1516
1/4	0,250	1/4	0,030	0,1196	0,0804	-	-	1195	1102
5/16	0,312	1/3	0,032	0,1624	0,1090	-	-	1017	937
3/8	0,375	3/8	0,032	0,1989	0,1340	-	-	836	770
1/2	0,500	1/2	0,032	0,2714	0,1820	NOT MANUFACTURED		618	569
5/8	0,625	5/8	0,035	0,3742	0,2510	-	-	525	484
3/4	0,750	3/4	0,035	0,4535	0,3050	-	-	435	400
7/8	0,875	7/8	0,045	0,6768	0,4550	-	-	495	456
1 1/8	1,125	1 1/8	0,050	0,9740	0,6550	-	-	420	387
1 3/8	1,375	1 3/8	0,055	1,3156	0,8840	-	-	373	344
1 5/8	1,625	1 5/8	0,060	1,7016	1,1400	-	-	347	320

The figures provided are for guidance only, based on the indicated temperatures

Copper Tube Technical Data

TYPE "M" - STANDARD ASTM B 88

Nominal or Standard Size, in.	O.D. (in.)		Wall Thickness, in. (Nom.)	Theoretical Weight kg/m Nominal	Theoretical Weight lb/ft Nominal	Rated internal working pressures Hard Drawn 150°F - 56.7°C S = 10,300 psi	Hard Drawn 300°F - 113.4°C S = 10,000 psi	Annealed 150°F - 56.7°C S = 5,100 psi	Annealed 300°F - 113.4°C S = 4,700 psi
3/8	0,500	1/2	0,025	0,215	0,145	982	953	485	447
1/2	0,625	5/8	0,028	0,303	0,204	850	825	420	387
3/4	0,875	7/8	0,032	0,489	0,328	701	680	346	319
1	1,125	1 1/8	0,035	0,691	0,465	580	563	286	264
1 1/4	1,375	1 3/8	0,042	1,015	0,682	582	565	287	265
1 1/2	1,625	1 5/8	0,049	1,399	0,940	569	553	282	259
2	2,125	2 1/8	0,058	2,172	1,460	514	499	254	234
2 1/2	2,625	2 5/8	0,065	3,015	2,030	471	457	233	215
3	3,125	3 1/8	0,072	3,983	2,680	435	423	215	199
3 1/2	3,625	3 5/8	0,083	5,327	3,580	433	421	214	197
4	4,125	4 1/8	0,095	6,938	4,660	431	419	213	197
5	5,125	5 1/8	0,109	9,908	6,660	400	388	198	182
6	6,125	6 1/8	0,122	13,271	8,920	375	364	186	171
8	8,125	8 1/8	0,170	24,506	16,500	394	382	195	180

The figures provided are for guidance only, based on the indicated temperatures

TYPE "L" - STANDARD ASTM B 88

Nominal or Standard Size, in.	O.D. (in.)		Wall Thickness, in. (Nom.)	Theoretical Weight kg/m Nominal	Theoretical Weight lb/ft Nominal	Rated internal working pressures Hard Drawn 150°F - 56.7°C S = 10,300 psi	Hard Drawn 300°F - 113.4°C S = 10,000 psi	Annealed 150°F - 56.7°C S = 5,100 psi	Annealed 300°F - 113.4°C S = 4,700 psi
1/4	0,375	3/8	0,030	0,1876	0,126	1569	1524	775	714
3/8	0,500	1/2	0,035	0,2949	0,198	1341	1302	662	610
1/2	0,625	5/8	0,040	0,4240	0,285	1242	1206	613	565
5/8	0,750	3/4	0,042	0,5389	0,362	1086	1055	537	495
3/4	0,875	7/8	0,045	0,6768	0,455	1002	972	495	456
1	1,125	1 1/8	0,050	0,9740	0,655	850	825	420	387
1 1/4	1,375	1 3/8	0,055	1,3156	0,884	755	733	373	344
1 1/2	1,625	1 5/8	0,060	1,7016	1,14	702	682	347	320
2	2,125	2 1/8	0,070	2,6067	1,75	625	607	309	285
2 1/2	2,625	2 5/8	0,080	3,6895	2,48	577	560	285	263
3	3,125	3 1/8	0,090	4,9498	3,33	545	529	270	248
3 1/2	3,625	3 5/8	0,100	6,3878	4,29	522	506	258	238
4	4,125	4 1/8	0,110	8,0033	5,38	504	489	249	230
5	5,125	5 1/8	0,125	11,3258	7,61	462	449	229	211
6	6,125	6 1/8	0,140	15,1838	10,2	431	418	213	196
8	8,125	8 1/8	0,200	28,7223	19,3	464	451	230	212

The figures provided are for guidance only, based on the indicated temperatures

TYPE "K" - STANDARD ASTM B 88

Nominal or Standard Size, in.	O.D. (in.)		Wall Thickness, in. (Nom.)	Theoretical Weight kg/m Nominal	Theoretical Weight lb/ft Nominal	Rated internal working pressures Hard Drawn 150°F - 56.7°C S = 10,300 psi	Hard Drawn 300°F - 113.4°C S = 10,000 psi	Annealed 150°F - 56.7°C S = 5,100 psi	Annealed 300°F - 113.4°C S = 4,700 psi
1/4	0,375	3/8	0,035	0,2156	0,145	1850	1796	913	842
3/8	0,500	1/2	0,049	0,4005	0,269	1946	1889	960	885
1/2	0,625	5/8	0,049	0,5115	0,344	1534	1490	758	698
5/8	0,750	3/4	0,049	0,6224	0,418	1266	1229	626	577
3/4	0,875	7/8	0,065	0,9541	0,641	1466	1424	724	668
1	1,125	1 1/8	0,065	1,2486	0,839	1126	1093	557	513
1 1/4	1,375	1 3/8	0,065	1,5430	1,04	914	888	452	416
1 1/2	1,625	1 5/8	0,072	2,0263	1,36	850	825	420	387
2	2,125	2 1/8	0,083	3,0713	2,06	747	726	370	341
2 1/2	2,625	2 5/8	0,095	4,3555	2,93	684	664	338	312
3	3,125	3 1/8	0,109	5,9573	4,00	662	643	328	302
3 1/2	3,625	3 5/8	0,120	7,6218	5,12	628	610	311	286
4	4,125	4 1/8	0,134	9,6912	6,51	618	600	306	282
5	5,125	5 1/8	0,160	14,3956	9,67	592	575	293	270
6	6,125	6 1/8	0,192	20,6426	13,90	595	578	295	271
8	8,125	8 1/8	0,271	38,5700	25,90	634	615	314	289

The figures provided are for guidance only, based on the indicated temperatures

STRAIGHT LENGTHS - ASTM B 280

Nominal or Standard Size, in.	O.D. (in.)		Wall Thickness, in. (Nom.)	Theoretical Weight kg/m Nominal	Theoretical Weight lb/ft Nominal	Rated internal working pressures Hard Drawn 150°F - 56.7°C S = 10,300 psi	Hard Drawn 300°F - 113.4°C S = 10,000 psi	Annealed 150°F - 56.7°C S = 5,100 psi	Annealed 300°F - 113.4°C S = 4,700 psi
3/8	0,375	3/8	0,03	0,1876	0,126	1569	1524	777	716
1/2	0,5	1/2	0,035	0,2949	0,198	1341	1302	664	612
5/8	0,625	5/8	0,04	0,4240	0,285	1242	1206	615	567
3/4	0,75	3/4	0,042	0,5389	0,362	1086	1055	538	496
7/8	0,875	7/8	0,045	0,6768	0,455	1002	972	496	457
1 1/8	1,125	1 1/8	0,05	0,9740	0,655	850	825	421	388
1 3/8	1,375	1 3/8	0,055	1,3156	0,884	755	733	374	344
1 5/8	1,625	1 5/8	0,060	1,7016	1,14	702	682	348	320
2 1/8	2,125	2 1/8	0,070	2,6067	1,75	625	607	309	258
2 5/8	2,625	2 5/8	0,080	3,6895	2,48	577	560	286	263
3 1/8	3,125	3 1/8	0,090	4,9498	3,33	545	529	270	249
3 5/8	3,625	3 5/8	0,100	6,3878	4,29	522	506	258	238
4 1/8	4,125	4 1/8	0,110	8,0033	5,38	504	489	249	230

The figures provided are for guidance only, based on the indicated temperatures

Refrigeration Tubes manufactured by us in accordance with this standard are suited to work with the new EC refrigerants. The refrigeration coils & tubes according to this standard fulfill the requirements according to ASTM B280 & EN 12735-1

Nominal outside diameters and thicknesses EN 12735-1 : 2001

Nominal outside diameter d			Nominal wall tickness e mm						
metric series	imperial series								
mm	mm	in	0,8	1,0	1,25	1,5	1,65	2,0	2,5
	3,18	1/8	●						
	3,97	5/32	●	●					
	4,76	3/16	●						
6			■ ●	■ ●					
	6,35	1/4	●	■ ●					
	7,94	5/16	●	■ ●					
8			■ ●	■ ●					
	9,52	3/8	●	■ ●					
10			■ ●	■ ●					
12				■ ●					
	12,7	1/2	●	■ ●					
15				■ ●					
	15,87	5/8		■ ●					
18				■ ●					
	19,05	3/4		■ ●	■				
22				■ ●					
	22,23	7/8		■ ●	■				
	25,4	1		■ ●					
28						■			
	28,57	1 1/8		■	■				
	34,92	1 3/8			■				
35						■			
	41,27	1 5/8			■				
42						■			
	53,97	2 1/8			■		■		
54								■	
64								■	
	66,67	2 5/8			■		■	■	
76,1								■	
	79,37	3 1/8					■		■
	88,90	3 1/2						■	
	92,07	3 5/8					■		■
	104,80	4 1/8					■		■
108									■
■ available in straight lengths					■	IUSA			
● available in coils					●	IUSA			

Product range IUSA

Values in millimetres

Nominal outside diameter d		Wall Thickness e	
over [b]	up to and including	over [c]	up to and including
6	104,8	0,6	2,5

[b] including 6 [c] including 6

Mechanical Properties

Temper		Tensile strength	Elongation
Designation in accordance with EN 1173	Common Term	Mpa min.	% min.
R220	annealed	220	40
R250	half-hard	250	30
R290	hard	290	3

*** Any OD / WT not considered in above tables, might be supplied on request.**

Standardized dimensions EN 1057: 2006
Formerly BS 2871 Part 1

(Tube Complying to these standards is suitable for Hot and Cold Water services, gas services,sanitation and Central Heating)

Values in millimetres

Nominal Outside Diameter d	Nominal wall thickness e											
	0,5	0,6	0,7	0,8	0,9	,1,0	1,1	1,2	1,5	2,0	2,5	3,0
6		R		R		R						
8		R		R		R						
10		R	R	R		R						
12		R	R	R		R						
14				R		R						
15			R	R		R						
16						R						
18				R		R						
22					R	R	R	R	R			
28					R	R		R	R			
35						R		R	R			
40						R						
42						R		R	R			
54						R		R	R	R		
64										R		
66,7								R		R		
76,1									R	R		
88,9										R		
108									R		R	
133									R			R
159										R		R
219												R
267												R

R Indicates the dimensions recommended for consideration in national codes of practice.

R **IUSA**
R **Ability to supply on request**

Product range IUSA

Mechanical Properties

Material condition		Nominal outside diameter d (mm)		Tensile strength	Elongation
Designation in accordance with EN 1173	Common Term	min.	max.	Mpa min.	% min.
R220	annealed	6	22	220	40
R250	half-hard	12	28	250	30 [a] 20 [a]
R290	hard	8	88,9	290	3

[a] Relationship between tube dimensions and elongation for R250 (half hard) tubes are in accordance to table 2 of Standard BS EN 1057

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