



**CAMBRIDGE-LEE INDUSTRIES, LLC**



**LEADING SUPPLIER OF COPPER TUBE IN THE  
USA, MEXICO AND LATIN AMERICA**



**CAMBRIDGE-LEE INDUSTRIES, LLC**

*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. Tubes manufactured are continuously tested for defects by Eddy-Current test units.

ACR Copper Coils & Pipes are dehydrated, degreased, purged with nitrogen and capped to maintain the internal cleanliness of the product.

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. Each Coil is individually packed in dye cut carton boxes. This ensures the Originality & Exclusivity of the product while also giving additional protection during Transportation. Environmentally harmful material such as plastic shrink wrap are eliminated in the packaging process.



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.

**Compatibility to Fittings**

Copper Tubes & Coils manufactured by IUSA Cambridge Lee are compatible with Copper Fittings manufactured by NIBCO INC or equivalent.



## Copper Tube Product Range

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

| Product     | Application                              | Temper                        | Specifications |
|-------------|--|-------------------------------|----------------|
| Copper Tube | Water and gas in<br>sanitary and heating | Annealed<br>Half Hard<br>Hard | BS EN 1057     |
| Copper Tube | Water and gas in<br>sanitary and heating | Annealed<br>Half Hard<br>Hard | BS 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 and B251 Standards.

### Cleanliness and Appearance

As per requirements of standard ASTM B 743, any residue on the inside of the tube will not exceed 0.0035 gm/ft<sup>2</sup> (0.038 g/m<sup>2</sup>).

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

We can supply special tempers on request.



**LWC Mechanical Properties ASTM B 743**

| Temper Designation | Wall Thickness in (mm)                                | Rockwell Hardness |        | Tensile Strength Min |       | Yield Strength Min |       | Enlogation in 2 in Min % | Average Grain Size mm |
|--------------------|---|-------------------|--------|----------------------|-------|--------------------|-------|--------------------------|-----------------------|
|                    |   | Scale             | Value  | Ksi                  | (Mpa) | Ksi                | (Mpa) |                          |                       |
| H58                | 0.020 an over (0.508)                                 | 30T               | 30 Min | 36                   | (250) | 36                 | (250) | N/A                      | N/A                   |
| 050                | 0.020 to 0.035 (0.508 to 0.889)<br>Over 0.035 (0.889) | 15T               | 65 Max | 30                   | (205) | 9                  | (62)  | 40                       | 0.040 Máx.            |
|                    |   | F                 | 55 Max |                      |       |                    |       |                          |                       |
| 060                | 0.020 to 0.035 (0.508 to 0.889)<br>Over 0.035 (0.889) | 15T               | 60 Max | 30                   | (205) | 6                  | (40)  | 40                       | 0.040 Min.            |
|                    |   | F                 | 50 Max |                      |       |                    |       |                          |                       |

## ACR Mechanical Properties ASTM B 280

| Temper Designation |                       | Form             | Tensile Strength Min |       | Elongation in 2 in, min, % | Average Grain Size, mm | Expansion of Outside Diameter % |
|--------------------|-----------------------|------------------|----------------------|-------|----------------------------|------------------------|---------------------------------|
| Standard           | Former                |                  | Ksi                  | (Mpa) |                            |                        |                                 |
| O60                | Soft Annealed         | Coiled Lengths   | 30                   | (205) | 40                         | 0.040 Min              | 40                              |
| H58                | Drawn General Purpose | Straight Lengths | 36                   | (250) | N/A                        | N/A                    | N/A                             |

## ACR Copper Tube Technical Data Refrigeration Coils - ASTM B280 (Soft Annealed)

| O. D. (in.) |       | Wall Thickness, in. (Nom.) | Theoretical weight |               | Rated internal working pressures           |   |  |                                       |
|-------------|-------|----------------------------|--------------------|---------------|--|---|--|---------------------------------------|
|             |       |                            | Kg/m Nominal       | lb/ft Nominal | 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 | 0,030                      | 0,0516             | 0,0347        | -  | -   | 2613                                   | 2408                                  |
| 3/16        | 0,187 | 0,030                      | 0,0854             | 0,0575        | -  | -   | 1645                                   | 1516                                  |
| 1/4         | 0,250 | 0,030                      | 0,1196             | 0,0804        | -  | -   | 1195                                   | 1102                                  |
| 5/16        | 0,312 | 0,032                      | 0,1624             | 0,1090        | -  | -   | 1017                                   | 937                                   |
| 3/8         | 0,375 | 0,032                      | 0,1989             | 0,1340        | -  | -   | 836                                    | 770                                   |
| 1/2         | 0,500 | 0,032                      | 0,2714             | 0,1820        | NOT MANUFACTURED                           |   | 618                                    | 569                                   |
| 5/8         | 0,625 | 0,035                      | 0,3742             | 0,2510        | -  | -   | 525                                    | 484                                   |
| 3/4         | 0,750 | 0,035                      | 0,435              | 0,3050        | -  | -   | 435                                    | 400                                   |
| 7/8         | 0,875 | 0,045                      | 0,6768             | 0,4550        | -  | -   | 495                                    | 456                                   |
| 1 1/8       | 1,125 | 0,050                      | 0,974              | 0,6650        | -  | -   | 420                                    | 387                                   |

The figures provided are for guidance only, based on the indicated temperatures  
(Suitable for R-410a gas applications)

## ACR Hard Drawn Straight Lengths - ASTM B280

| Standard size, in. | O. D. (in.) |       | Wall Thickness, in. | Theoretical Weight |               | Rated internal working pressures        |   |
|--------------------|-------------|-------|---------------------|--------------------|---------------|---|---|
|                    |             |       |                     | Kg/m Nominal       | lb/ft Nominal | Hard Drawn 150° F-56.7°C S = 10,300 psi | Hard Drawn 300° F- 113.4° C S= 10,000 psi |
| 3/8                | 0,375       | 3/8   | 0,030               | 0,1876             | 0,126         | 1569                                    | 1524                                      |
| 1/2                | 0,500       | 1/2   | 0,035               | 0,2949             | 0,198         | 1341                                    | 1302                                      |
| 5/8                | 0,625       | 5/8   | 0,040               | 0,4240             | 0,285         | 1242                                    | 1206                                      |
| 3/4                | 0,750       | 3/4   | 0,042               | 0,5389             | 0,362         | 1086                                    | 1055                                      |
| 7/8                | 0,875       | 7/8   | 0,045               | 0,6768             | 0,455         | 1002                                    | 972                                       |
| 1 1/8              | 1,125       | 1 1/8 | 0,050               | 0,9740             | 0,655         | 850                                     | 825                                       |
| 1 3/8              | 1,375       | 1 3/8 | 0,055               | 1,3156             | 0,884         | 755                                     | 733                                       |
| 1 5/8              | 1,625       | 1 5/8 | 0,060               | 1,7016             | 1,14          | 702                                     | 682                                       |
| 2 1/8              | 2,125       | 2 1/8 | 0,070               | 2,6067             | 1,75          | 625                                     | 607                                       |
| 2 5/8              | 2,625       | 2 5/8 | 0,080               | 3,6895             | 2,48          | 577                                     | 560                                       |
| 3 1/8              | 3,125       | 3 1/8 | 0,090               | 4,9498             | 3,33          | 545                                     | 529                                       |
| 3 5/8              | 3,625       | 3 5/8 | 0,100               | 6,3878             | 4,29          | 522                                     | 506                                       |
| 4 1/8              | 4,125       | 4 1/8 | 0,110               | 8,0033             | 5,38          | 504                                     | 489                                       |

The figures provided are for guidance only, based on the indicated temperatures  
(Suitable for R-410a gas applications)

## L, K and M Mechanical Properties ASTM B 88

| Temper Designation |          | Form             | Rockwell Hardness |        | Tensile Strength Min |       | Average Grain Size<br>mm | Expansion of Outside Diameter<br>% |
|--------------------|----------|------------------|-------------------|--------|----------------------|-------|--------------------------|------------------------------------|
| Standard           | Former   |                  | Scale             | Value  | Ksi                  | (Mpa) |                          |                                    |
| O60                | Annealed | Coils            | F                 |        | 30                   | (250) | 0.040 Min                | 40                                 |
| O50                | Annealed | Straight Lengths | F                 | 55 Max | 30                   | (205) |                          | 40                                 |
| H58                | Drawn    | Drawn            | 30T               | 30 Min | 36                   | (205) | N/A                      |                                    |

## Copper Tube Technical Data

| TYPE "L" - STANDARD ASTM B 88 |             |       |                     | Theoretical Weight |               | Rated internal working pressures              |   |
|-------------------------------|-------------|-------|---------------------|--------------------|---------------|---|---|
| Nominal or Standard size, in. | O. D. (in.) |       | Wall Thickness, in. | Kg/m Nominal       | lb/ft Nominal | Hard Drawn<br>150° F-56.7°C<br>S = 10,300 psi | Hard Drawn<br>300° F- 113.4° C<br>S= 10,000 psi |
| 1/4                           | 0,375       | 3/8   | 0,030               | 0,1876             | 0,126         | 1569  | 1524  |
| 3/8                           | 0,500       | 1/2   | 0,035               | 0,295              | 0,198         | 1341  | 1302  |
| 1/2                           | 0,625       | 5/8   | 0,040               | 0,424              | 0,285         | 1242  | 1206  |
| 5/8                           | 0,750       | 3/4   | 0,042               | 0,539              | 0,362         | 1086  | 1055  |
| 3/4                           | 0,875       | 7/8   | 0,045               | 0,677              | 0,455         | 1002  | 972   |
| 1                             | 1,125       | 1 1/8 | 0,050               | 0,974              | 0,655         | 850   | 825   |
| 1 1/4                         | 1,375       | 1 3/8 | 0,055               | 1,316              | 0,884         | 755   | 733   |
| 1 1/2                         | 1,625       | 1 5/8 | 0,060               | 1,697              | 1,14          | 702   | 682   |
| 2                             | 2,125       | 2 1/8 | 0,070               | 2,604              | 1,75          | 625   | 607   |
| 2 1/2                         | 2,625       | 2 5/8 | 0,080               | 3,691              | 2,48          | 577   | 560   |
| 3                             | 3,125       | 3 1/8 | 0,090               | 4,956              | 3,33          | 545   | 529   |
| 3 1/2                         | 3,625       | 3 5/8 | 0,100               | 6,384              | 4,29          | 522   | 506   |
| 4                             | 4,125       | 4 1/8 | 0,110               | 8,006              | 5,38          | 504   | 489   |
| 5                             | 5,125       | 5 1/8 | 0,125               | 11,325             | 7,61          | 462   | 449   |
| 6                             | 6,125       | 6 1/8 | 0,140               | 15,179             | 10,20         | 431   | 418   |
| 8                             | 8,125       | 8 1/8 | 0,200               | 28,722             | 19,30         | 464   | 451   |

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

| TYPE "K" - STANDARD ASTM B 88 |             |       |                     | Theoretical Weight |               | Rated internal working pressures              |   |
|-------------------------------|-------------|-------|---------------------|--------------------|---------------|---|---|
| Nominal or Standard size, in. | O. D. (in.) |       | Wall Thickness, in. | Kg/m Nominal       | lb/ft Nominal | Hard Drawn<br>150° F-56.7°C<br>S = 10,300 psi | Hard Drawn<br>300° F- 113.4° C<br>S= 10,000 psi |
| 1/4                           | 0,375       | 3/8   | 0,035               | 0,2156             | 0,145         | 1850  | 1796  |
| 3/8                           | 0,500       | 1/2   | 0,049               | 0,4005             | 0,269         | 1946  | 1889  |
| 1/2                           | 0,625       | 5/8   | 0,049               | 0,5115             | 0,344         | 1534  | 1490  |
| 5/8                           | 0,750       | 3/4   | 0,049               | 0,6224             | 0,418         | 1266  | 1229  |
| 3/4                           | 0,875       | 7/8   | 0,065               | 0,9541             | 0,641         | 1466  | 1424  |
| 1                             | 1,125       | 1 1/8 | 0,065               | 1,2486             | 0,839         | 1126  | 1093  |
| 1 1/4                         | 1,375       | 1 3/8 | 0,065               | 1,5430             | 1,04          | 914   | 888   |
| 1 1/2                         | 1,625       | 1 5/8 | 0,072               | 2,0263             | 1,36          | 850   | 825   |
| 2                             | 2,125       | 2 1/8 | 0,083               | 3,0713             | 2,06          | 747   | 726   |
| 2 1/2                         | 2,625       | 2 5/8 | 0,095               | 4,3555             | 2,93          | 684   | 664   |
| 3                             | 3,125       | 3 1/8 | 0,109               | 5,9573             | 4,00          | 662   | 643   |
| 3 1/2                         | 3,625       | 3 5/8 | 0,120               | 7,6218             | 5,12          | 628   | 610   |
| 4                             | 4,125       | 4 1/8 | 0,134               | 9,6912             | 6,51          | 618   | 600   |
| 5                             | 5,125       | 5 1/8 | 0,160               | 14,3956            | 9,67          | 592   | 575   |
| 6                             | 6,125       | 6 1/8 | 0,192               | 20,6426            | 13,90         | 595   | 578   |
| 8                             | 8,125       | 8 1/8 | 0,271               | 38,5700            | 25,90         | 634   | 615   |

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

| TYPE "M" - STANDARD ASTM B 88 |             |       | Theoretical Weight  |              | Rated internal working pressures |  |  |
|-------------------------------|-------------|-------|---------------------|--------------|----------------------------------|--|--|
| Nominal or Standard size, in. | O. D. (in.) |       | Wall Thickness, in. | Kg/m Nominal | lb/ft Nominal                    | Hard Drawn 150° F-56.7°C<br>S = 10,300 psi | Hard Drawn 300° F- 113.4° C<br>S= 10,000 psi |
|                               | 3/8         | 0,500 |                     |              |                                  |  |  |
| 1/2                           | 0,625       | 5/8   | 0,028               | 0,303        | 0,204                            | 850  | 825  |
| 3/4                           | 0,875       | 7/8   | 0,032               | 0,489        | 0,328                            | 701  | 680  |
| 1                             | 1,125       | 1 1/8 | 0,035               | 0,691        | 0,465                            | 580  | 563  |
| 1 1/4                         | 1,375       | 1 3/8 | 0,042               | 1,015        | 0,682                            | 582  | 565  |
| 1 1/2                         | 1,625       | 1 5/8 | 0,049               | 1,399        | 0,940                            | 569  | 553  |
| 2                             | 2,125       | 2 1/8 | 0,058               | 2,172        | 1,460                            | 514  | 499  |
| 2 1/2                         | 2,625       | 2 5/8 | 0,065               | 3,015        | 2,030                            | 471  | 457  |
| 3                             | 3,125       | 3 1/8 | 0,072               | 3,983        | 2,680                            | 435  | 423  |
| 3 1/2                         | 3,625       | 3 5/8 | 0,083               | 5,327        | 3,580                            | 433  | 421  |
| 4                             | 4,125       | 4 1/8 | 0,095               | 6,938        | 4,660                            | 431  | 419  |
| 5                             | 5,125       | 5 1/8 | 0,109               | 9,908        | 6,660                            | 400  | 388  |
| 6                             | 6,125       | 6 1/8 | 0,122               | 13,271       | 8,920                            | 375  | 364  |
| 8                             | 8,125       | 8 1/8 | 0,170               | 24,506       | 16,500                           | <b>394</b>                                 | <b>382</b>                                   |

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

Copper Pipes & Coils manufactured to ASTM B280 & ASTM B88 are suitable for R-410a gas applications and other high pressure refrigerants.

### ACR Copper Tube (Perform Range) Technical Data

Meets UL 207 for / 700 psi rated tubes high-pressure refrigerant gases for ACR applications

| REFRIGERATION COILS SPECIAL WALL THICKNESS (PERFORM) - SOFT ANNEALED |       |                |       |                  |         |        |                                 |       |
|--|-------|----------------|-------|------------------|---------|--------|---------------------------------|-------|
| Nominal Size of tube   |       | Wall Thickness |       | Theoretical Mass | Lengths |        | Rated Internal Working Pressure |       |
| (mm)   | (in)  | (mm)           | (in)  | (Kg/m)           | (m)     | (Feet) | (psi)                           | (Mpa) |
| 6.35   | 1/4   | 0.61           | 0.024 | 0.098            | 15.24   | 50     | 1126.28                         | 7.77  |
| 7.94   | 5/16  | 0.61           | 0.024 | 0.125            | 15.24   | 50     | 889.19                          | 6.13  |
| 9.53   | 3/8   | 0.61           | 0.024 | 0.153            | 15.24   | 50     | 734.56                          | 5.06  |
| 12.70  | 1/2   | 0.71           | 0.028 | 0.239            | 15.24   | 50     | 635.38                          | 4.38  |
| 15.88  | 5/8   | 0.71           | 0.028 | 0.303            | 15.24   | 50     | 504.45                          | 3.48  |
| 19.05  | 3/4   | 0.81           | 0.032 | 0.416            | 15.24   | 50     | 485.66                          | 3.35  |
| 22.23  | 7/8   | 0.89           | 0.035 | 0.533            | 15.24   | 50     | 443.51                          | 3.06  |
| 28.58  | 1 1/8 | 1.02           | 0.040 | 0.786            | 15.24   | 50     | 398.62                          | 2.75  |

Note:

Cleanliness: Bore quality meets the 0.038 g/m ASTM B280 specified limit.

| ACR TUBES SPECIAL WALL THICKNESS (PERFORM) - HARD TEMPER |       |                |       |                  |         |        |                                 |       |
|--|-------|----------------|-------|------------------|---------|--------|---------------------------------|-------|
| Nominal Size of tube                                     |       | Wall Thickness |       | Theoretical Mass | Lengths |        | Rated Internal Working Pressure |       |
| (mm)   | (in)  | (mm)           | (in)  | (kg/m)           | (m)     | (Feet) | (psi)                           | (Mpa) |
| 9.53   | 3/8   | 0.61           | 0.024 | 0.152            | 5.8     | 19     | 1534.29                         | 10.58 |
| 12.70  | 1/2   | 0.61           | 0.024 | 0.207            | 5.8     | 19     | 935.59                          | 6.45  |
| 15.88  | 5/8   | 0.71           | 0.028 | 0.303            | 5.8     | 19     | 865.97                          | 5.97  |
| 19.05  | 3/4   | 0.71           | 0.028 | 0.366            | 5.8     | 19     | 717.52                          | 4.95  |
| 22.23  | 7/8   | 0.81           | 0.032 | 0.489            | 5.8     | 19     | 711.68                          | 4.91  |
| 28.58  | 1 1/8 | 0.91           | 0.036 | 0.710            | 5.8     | 19     | 607.53                          | 4.19  |
| 34.93  | 1 3/8 | 1.02           | 0.040 | 0.958            | 5.8     | 19     | 557.46                          | 3.84  |
| 41.28  | 1 5/8 | 1.07           | 0.042 | 1.205            | 5.8     | 19     | 496.56                          | 3.42  |
| 53.98  | 2 1/8 | 1.42           | 0.056 | 2.100            | 5.8     | 19     | 483.01                          | 3.33  |
| 66.68  | 2 5/8 | 1.63           | 0.064 | 2.970            | 5.8     | 19     | 462.63                          | 3.19  |
| 79.38  | 3 1/8 | 1.78           | 0.070 | 3.875            | 5.8     | 19     | 428.22                          | 2.95  |
| 104.78   | 4 1/8 | 2.03           | 0.080 | 5.864            | 5.8     | 19     | 364.12                          | 2.51  |

Note:

Cleanliness: Bore quality meets the 0.038 g/m2 ASTM B280 specified limit.



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