



PRECISION THIN-WALL EXACT STRAIGHT LENGTH COPPER TUBE

CerroSpec® is our world-class seamless, thin-wall copper tube manufactured to exacting tolerances. Its precision and ability to hold tighter dimensional specifications allow for improved performance characteristics and product yield. Plus, our carefully controlled annealing process introduces a new level of cleanliness and quality while our innovative packaging solutions help reduce your costs.

| Product | Temper | Weights | Uses | Specifications |
|----------------------------------|--------------------|--|------------------------------------|----------------|
| Straight Lengths, ESL | H58 (Drawn) | In bundles of 1000 lb. (standard) | Heat exchangers, chillers, heaters | ASTM B68, B75 |
| | H80 (Hard drawn) | | | |
| | 050 (Light anneal) | 500 to 1000 lb. | Heat exchangers, chillers, heaters | |
| | 060 (Soft anneal) | | | |
| Light anneal rotary straightened | | Heat exchangers, chillers, baseboard heaters | | |

Exact Straight Lengths (ESL) - tubes which have been mechanically straightened and then cut to specific lengths as specified by the customer. They are produced within the following dimensional ranges:

- Min. Diameter – 3/16" (4.76 mm)
- Max. Diameter – 1-1/8" (28.58 mm)
- Min. Length – 10" (254.00 mm)
- Max. Length – 25' (7.62 M)

Range of Sizes*

| Outside Diameter | | Wall Thickness | | | |
|------------------|-------------|----------------|------|-------------|------|
| Inches | Millimeters | Inches | | Millimeters | |
| | | Min | Max | Min | Max |
| .1875 | 4.76 | .020 | .030 | .51 | .76 |
| .250 | 6.36 | .020 | .045 | .51 | 1.14 |
| .3125 | 7.94 | .011 | .055 | .28 | 1.40 |
| .375 | 9.53 | .011 | .065 | .31 | 1.65 |
| .500 | 12.70 | .015 | .065 | .38 | 1.65 |
| .625 | 15.88 | .016 | .065 | .41 | 1.65 |
| .750 | 19.05 | .017 | .065 | .43 | 1.65 |
| .875 | 22.23 | .018 | .065 | .46 | 1.65 |
| 1.00 | 25.40 | .025 | .065 | .64 | 1.65 |
| 1.125 | 28.58 | .028 | .050 | .71 | 1.27 |

UNS Alloys — Copper C12200 and C12000 only.

* Consult mill for availability of dimensions that are outside above values.

Cleanliness - lengths are capped with plastic end caps when specified by the customer.

Tolerances - exact straight lengths are produced to the dimensional tolerances specified in ASTM B251. Closer tolerances may be available provided a prior agreement is reached between Cerro and the customer.

Box Weights and Packaging - exact straight lengths are provided in standard 500 or 1,000 lb. bare bundles or with a protective wrapping.

Testing - all exact straight lengths are eddy current tested in accordance with ASTM E243. Exact straight lengths are provided with no detectable defects.



Tempers - exact straight lengths are provided in the following tempers and grain sizes: light annealed, light annealed rotary straightened, soft anneal, dead soft, and hard.

Light Anneal (050) - .015 - .040 mm grain - preferred for tight bends and extreme forming applications. This is an annealed temper with a fine grain size to prevent "orange peel" and fracturing when forming.

Light Annealed Rotary Straightened (LAR) - .015 - .040 mm grain - this temper is essentially similar to a light annealed temper, but has subsequently been rotary straightened to increase the yield strength. This temper is very formable, but has increased rigidity for handling.

Soft Anneal (060) - .040 - .060 mm grain - this temper is suitable for general purpose bending and forming which is not as extreme as that requiring light annealed temper. Soft anneal temper work hardens at a slower rate than light anneal.

Dead Soft - .070 mm grain and above - this is a large grained product and is used where the product is cold worked repeatedly. This temper work hardens at a much slower rate but is not suitable for extreme forming.

Hard Drawn (H80) - no visible grain - used where minimal forming will be performed and maximum strength is required.

End Finish - supplied with a commercial saw cut with minimum burrs as standard.

PRECISION THIN-WALL LEVEL WOUND COPPER TUBE

A level wound coil is a long continuous length of tube that is tightly wound in layers. Such coils are typically used for manufacturing end users.

| Product | Temper | Coil Weights | Uses | Specifications |
|-------------------------------------|--------------------|---|---|---------------------|
| Level Wound coils, Smooth ID | H58 (Drawn) | Available in nominal coil weights of 260 lb., 350 lb. and 520 lb. | Heating, air conditioning and refrigeration applications (evaporators, condensers, chillers, boilers, space heaters, etc.) Specialized plumbing applications | ASTM B68, B75, B743 |
| | 050 (Light anneal) | | | |
| | 060 (Soft anneal) | | | |



Level Wound Coils - produced in the following outside diameter size ranges.

Min. Diameter - 3/16" (4.76 mm)

Max. Diameter - 1-1/8" (28.58 mm)

Range of Sizes*

| Outside Diameter | | Wall Thickness | | | |
|------------------|-------------|----------------|------|-------------|------|
| Inches | Millimeters | Inches | | Millimeters | |
| | | Min | Max | Min | Max |
| .1875 | 4.76 | .020 | .030 | .51 | .76 |
| .250 | 6.36 | .020 | .045 | .51 | 1.14 |
| .3125 | 7.94 | .011 | .055 | .28 | 1.40 |
| .375 | 9.53 | .011 | .065 | .31 | 1.65 |
| .500 | 12.70 | .015 | .065 | .38 | 1.65 |
| .625 | 15.88 | .016 | .065 | .41 | 1.65 |
| .750 | 19.05 | .017 | .065 | .43 | 1.65 |
| .875 | 22.23 | .018 | .065 | .46 | 1.65 |
| 1.00 | 25.40 | .025 | .065 | .64 | 1.65 |
| 1.125 | 28.58 | .028 | .050 | .71 | 1.27 |

UNS Alloys — Copper C12200 and C12000 only.

* Consult mill for wall dimension availability that is higher or lower than these max./min. values.

Cleanliness - annealed copper tubing in coils meets or exceeds the cleanliness levels specified in ASTM B280 and B743. Coils are capped with plastic end caps when specified by the customer.

Tolerances - level wound copper tubing is produced to the dimensional tolerances specified in ASTM B251. Closer tolerance may be available provided a prior agreement is reached between Cerro and the customer.

Type of Packaging - level wound coils are provided on disposable double wall cardboard reels, returnable fiber core reels, or bulk packed (without reels) at the customer's option. Coils are stacked on a wooden pallet and enclosed in an outer package. The following types of outer packaging are currently available: 1) A standard 4-high stretch-wrapped stack of coils (reel or bulk); 2) A 7-high and 6-high stretch-wrapped stack of coils (reel or bulk). A wood spacer pallet is inserted in between two coils to enable removal of the top three coils; 3) A 4-high jumbo coil stretch-wrapped pack for 500 lb. coils with a wood spacer pallet between the second and third coil; 4) A sturdy triple wall cardboard octagon shroud.

Packaging Standards -

1) **Coil Dimensions:** Cerro's level wound coils have a 24" I.D. On tube sizes with a high O.D. wall ratio, larger I.D. may be required. Maximum O.D. of coils on reels is 41" and bulk pack coils is 42". The standard coil height is 10". Small O.D. tubes of 1/4" and below (6.3 mm and below) can be supplied in 6" (150 mm) coil height. 12" to 15" high coils may be provided in the case of bulk pack products that are required in coil weights that exceed 400 lb. (see below).

2) **Coil Weights:** Coils can be supplied in various nominal weights based on the tube O.D./wall ratio, as follows.

| Tube O.D./Wall Ratio | Coil Weights Available (Nominal) | Type of Package |
|----------------------|--|-----------------|
| ≥ 31.25 | 210 lb. (95 Kg.) 260 lb. (118 Kg.) | Reel or bulk |
| < 31.25 | 260 lb. (118 Kg.) 350 lb. (160 Kg.) | Reel or bulk |
| | Above 400 lb. (180 Kg.) | Bulk only |

Testing - all level wound coils are eddy current tested in accordance with ASTM E243. NDET imperfections are marked for removal by the customer.

Tempers - level wound coils are provided in the following tempers: light anneal, soft anneal, and hard. Coils in dead soft temper can also be provided if necessary, at extra cost.

PRECISION THIN-WALL PANCAKE AND BUNCH COILS COPPER TUBE

Pancake coils are of much shorter length than level wound coils and are typically used in the installation of air conditioning and refrigeration systems. They are also used in OEM end uses where suitable equipment is not available for handling level wound coils. Pancake coils are provided in a flat coil which are two layers thick. Bunch coils are similar to pancake coils, but all of the individual loops have the same diameter much like a coil of wire.

Pancake and Bunch Coils - Produced in the following outside diameter size ranges.

Min. Diameter - 3/16" (4.76 mm)

Max. Diameter - 1-1/8" (28.58 mm)

Lengths: Standard available lengths are 50, 60 and 100 feet.

Range of Sizes*

| Outside Diameter | | Wall Thickness | | | |
|------------------|-------------|----------------|------|-------------|------|
| Inches | Millimeters | Inches | | Millimeters | |
| | | Min | Max | Min | Max |
| .1875 | 4.76 | .020 | .030 | .51 | .76 |
| .250 | 6.36 | .020 | .045 | .51 | 1.14 |
| .3125 | 7.94 | .011 | .055 | .28 | 1.40 |
| .375 | 9.53 | .011 | .065 | .31 | 1.65 |
| .500 | 12.70 | .015 | .065 | .38 | 1.65 |
| .625 | 15.88 | .016 | .065 | .41 | 1.65 |
| .750 | 19.05 | .017 | .065 | .43 | 1.65 |
| .875 | 22.23 | .018 | .065 | .46 | 1.65 |
| 1.00 | 25.40 | .025 | .065 | .64 | 1.65 |
| 1.125 | 28.58 | .028 | .050 | .71 | 1.27 |

UNS Alloys — Copper C12200 only.

* Consult mill for wall dimension availability that is higher or lower than these max./min. values.

Packaging - pancake coils are available in individual corrugated packages stacked on a wooden skid and stretch wrapped. They are also available with multiple coils packed in a corrugated cardboard box with paper interleave between coils.

Testing - all coils are eddy current tested in accordance with ASTM specification E243. All coils are provided with no detectable defects.

Cleanliness - all annealed coils meet or exceed the cleanliness levels specified in ASTM B280. Coils are capped with plastic end caps when specified by the customer.

Tolerances - tube in pancake or bunch coils are produced to the applicable specifications of ASTM B68.

Temper - bunch or annealed coils are provided in light anneal or soft anneal.

Light Anneal (050) - .015 - .040 mm grain - preferred for tight bends and extreme forming applications. This is an annealed temper with a fine grain size to prevent "orange peel" and fracturing when forming.

Soft Anneal (060) - .040 - .060 mm grain - this temper is suitable for general purpose bending and forming which is not as extreme as that requiring light annealed temper. Soft anneal temper work hardens at a slower rate than light anneal.



CerroSpec – The dimensional tolerances referenced in the preceding technical data reflect the tolerances specified in ASTM B251. Due to the advanced technology installed at our facilities, these tolerances can frequently be surpassed, especially in the area of concentricity, (uniformity of wall thickness). This increased precision can generally aid in wall reduction programs as well as increased quality in formed or bent parts. Contact your Cerro Representative for further details.

**For packaging and pricing information,
go to www.cerrowflow.com
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