

*The most often heard contractor phrase:
No one else makes me do that, so why do I have to ...*

Bending Copper Tube & Identifying Copper Tube Types

Violation : Copper tubing shows signs of hand bending – a proper bending tool is required for bending
Code Section(s) : 5th Edition (2014) FBC-Residential P2906.1 Bends
5th Edition (2014) FBC-Plumbing (no similar requirement found)

Comments : Contractor shall replace all hand bent/deformed/bent without a proper bending tool sections – replace with change-of-direction fittings or with properly bent tubing sections

A. Violation : Copper tubing shows signs of being hand bent, a proper bending tool is required for bending

I realize that this reference is not a 'code required' reference – however, it does make a good trade-authoritative reference document ... from page 42 of [The Copper Handbook](#): (underlining is mine)

“Both annealed tube and hard drawn tube can be bent with the appropriate hand benders. The proper size of bender for each size tube must be used. For a guide to typical bend radii, see Table 13.

The procedure for bending copper tube with a lever-type hand bender is illustrated in Figure 9.”

The code is the authoritative document and the code states the same requirement:

From the 5th Edition (2014) Florida Building Code, Residential (underlining is mine)

o CHAPTER 29 WATER SUPPLY AND DISTRIBUTION

SECTION P2906 CHANGES IN DIRECTION

P2906.1 Bends.

Changes in direction in copper tubing are permitted to be made with bends having a radius of not less than four diameters of the tube, providing such bends are made by use of forming equipment that does not deform or create loss in cross-sectional area of the tube.

From the 5th Edition (2014) Florida Building Code, Plumbing

o (Author's note:

No similar requirement found in the 2014 Florida Building Code, Plumbing.)

B. I was asked if there was an easy way to identify copper tube: type, 'hard' drawn tube, and 'soft' annealed tube.

All copper tubing is to be permanently marked with incised marking – from Page 8 of [The Copper Handbook](#): “Identification of Copper Tube. Copper tube, Types K, L, M, ACR, DWV and Medical Gas, must be permanently marked (incised) in accordance with its governing specifications to show tube type, the name or trademark of the manufacturer, and the country of origin. In addition to incised markings, hard tube will have this information printed on it in a color which distinguishes its tube type (See Table 1).”

Type M copper is only available in 'hard' drawn tube.

Type M copper has the thinnest walls of Type M, L, and K.

- **Type M** copper 'hard' drawn tube has **red color labeling in addition to** the incised marking.

Type L copper is available in 'hard' drawn tube and 'soft' annealed tube.

Type L copper has thicker walls than Type M copper.

- **Type L** copper in 'hard' drawn tube has **blue color labeling in addition to** the incised marking.
- Type L copper 'soft' annealed tube **only has** the incised marking.
- **Type L** copper 'hard' drawn tube (**blue color labeling in addition to** the incised marking) is available in sticks which are not easily bent, a proper tube bending tool is required for bending.
- Type L copper 'soft' annealed tube (incised marking **only**) is available in sticks – the sticks are bendable, a proper tube bending tool is required for bending.
- Type L copper 'soft' annealed tube (incised marking **only**) is also available in coils – the tubing comes in coils and is easily bent, a proper tube bending tool is required for bending.

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Type K copper is available in 'hard' drawn tube and 'soft' annealed tube.

Type K copper has thicker walls than Type L copper.

- **Type K** copper in 'hard' drawn tube has **green color labeling in addition to** incised marking.
- Type K copper 'soft' annealed tube **only has** incised marking.
- **Type K** copper 'hard' drawn tube (**green color labeling in addition to** incised marking) is available in sticks which are not easily bent, a proper tube bending tool is required for bending.
- Type K copper 'soft' annealed tube (incised marking **only**) is available in sticks – the sticks are bendable, a proper tube bending tool is required for bending.
- Type K copper 'soft' annealed tube (incised marking **only**) is also available in coils – the tubing comes in coils and is easily bent, a proper tube bending tool is required for bending.

'Hard' drawn tube will have the **color labeling in addition to** the incised marking. The color of the labeling indicates the 'Type' of 'hard' drawn tube: **red = Type M; blue = Type L; and green = Type K.**

The above information is from here: [The Copper Tube Handbook](#). From page 8 of the handbook: "Identification of Copper Tube. Copper tube, Types K, L, M, ACR, DWV and Medical Gas, must be permanently marked (incised) in accordance with its governing specifications to show tube type, the name or trademark of the manufacturer, and the country of origin. In addition to incised markings, hard tube will have this information printed on it in a color which distinguishes its tube type (See Table 1)."

Table 1 is titled: "TABLE 1. Copper Tube: Types, Standards, Applications, Tempers, Lengths", on page 20 of the handbook, for color marking and other information."

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I look forward to all contributions, and suggestions for future topics.

Respectfully submitted,



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