Designation: B698/B698M – 10 (Reapproved 2016)ε1

Standard Classification for Seamless Copper and Copper Alloy Plumbing Pipe and Tube[1]

This standard is issued under the fixed designation B698/B698M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

ε1 NOTE—Designation changed to dual and units of measure statement was inserted in 1.5 editorially in November 2016.

1. Scope*

1.1 This classification covers various types of seamless copper and copper alloy[2] pipe and tube used for water service, distribution, and drainage. It is not a specification for the various types and alloys.

1.2 This classification uses the standard copper designations developed and used by the copper industry.

1.3 This classification makes no attempt to differentiate between all compositions that could be termed coppers or copper alloys, but, in conformance with general practice in the trade, includes those coppers and copper alloys commonly used in the manufacture of water service, distribution, and drainage pipe and tube.

1.4 This classification makes no attempt to differentiate between all applications of seamless copper and copper alloy piping and tube intended for use in water service distribution and drainage.

1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

B42 Specification for Seamless Copper Pipe, Standard Sizes

B43 Specification for Seamless Red Brass Pipe, Standard Sizes

B88 Specification for Seamless Copper Water Tube

B88M Specification for Seamless Copper Water Tube (Metric)

B302 Specification for Threadless Copper Pipe, Standard Sizes

B306 Specification for Copper Drainage Tube (DWV)

B846 Terminology for Copper and Copper Alloys

E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

3. Terminology

3.1 *Definitions*—For definitions of terms related to copper and copper alloys, including types of tube and pipe, refer to Terminology B846.

4. Significance and Use

4.1 This classification is provided to serve the needs of designers, specifiers, installers, and users of seamless copper and copper alloy plumbing tube and piping systems. It familiarizes them with the products available for such systems, giving size ranges and available materials for products listed herein. Also refer to Section 1.

5. Basis of Classification

5.1 Tables 1 and 2 list ASTM specifications, types, designations, general applications, range of sizes of water tubes produced currently, and the Copper and Copper Alloy UNS Number. The listed products are not necessarily available in the complete range of coppers and alloys or sizes, nor from any one supplier in all forms.

5.2 Existing ASTM specifications for seamless copper and copper alloys may cover more than one of the products listed in Table 1.

5.3 Table 3 contains the UNS Numbers, previous designations, and chemical composition of the coppers and copper alloys listed in Tables 1 and 2.

6. Keywords

6.1 copper; copper alloy; pipe; plumbing; seamless; tube

[1] This classification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.04 on Pipe and Tube.

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[2] The UNS system for copper and copper alloys (see Practice E527) is a simple expansion of the former standard designation system accomplished by the addition of a prefix "C" and a suffix "00." The suffix can be used to accommodate composition variations of the base alloy.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

TABLE 1 Classification for Seamless Copper and Copper Alloy Plumbing Pipe and Tube

ASTM Specification	Type	Designation	Application	Standard Mill Sizes, in.	Copper or Copper Alloy, UNS No.					
					C10200	C10300	C10800	C12000	C12200	C23000
B42	Seamless	copper pipe	plumbing and feed lines	⅛ –12	X	X	X	X	X	
B43	Seamless	red brass pipe	plumbing and feed lines	⅛ –12						X
B88	Seamless	Types K, L, M	general plumbing water tube	¼ –12	X			X	X	
B302	Seamless	TP	plumbing and feed lines	¼ –12		X			X	
B306	Seamless	Type DWV	drainage, waste, vent	1¼ –8					X	

TABLE 2 Classification for Seamless Copper Plumbing Tube (SI Units)

ASTM Specification	Type	Destination	Application	Standard Mill Sizes, mm	Copper or Copper Alloy, UNS No.
B88M	Seamless	Types A, B, C	General plumbing water tube	6–308	C10200 C12000 C12200

TABLE 3 Alloy Designation and Chemical Composition[A]

Copper or Copper Alloy UNS No.	Previously Used Designation	Composition, max, % (Unless Shown as a Range or Minimum)					
		Copper, incl Silver (% min)	Phosphorus	Iron	Lead	Zinc	Other Named Elements
C10200[B]	OF	99.95	...	...	...	...	0.0010 Oxygen
C10300	OFXLP	99.95[C]	0.001–0.005	...	...	...	...
C10800	OFLP	99.95[C]	0.005–0.012	...	...	...	...
C12000	DLP	99.90	0.004–0.012	...	...	...	...
C12200[D]	DHP	99.9	0.015–0.040	...	...	...	...
C23000[E]	Red brass, 85 %	84.0–86.0	...	0.05	0.05	remainder[F]	...

[A] Refer to the referenced product specification for details of chemical requirements.
[B] This is a high-conductivity copper that has in the annealed condition a minimum conductivity of 100 % IACS.
[C] Includes phosphorus.
[D] This includes oxygen-free copper that contains phosphorus in an amount agreed upon.
[E] For copper alloys in which zinc is specified as the remainder, either copper or zinc may be taken as the difference between the sum of all the elements analyzed and 100 %. When all the elements in Table 3 are analyzed, their sum shall be 99.8 % minimum.
[F] These specification limits do not preclude the presence of other elements. Limits for unnamed elements may be established by agreement between manufacturer or supplier and purchaser.

SUMMARY OF CHANGES

Committee B05 has identified the location of selected changes to this standard since the last issue (B698 - 02) that may impact the use of this standard. (Approved Oct. 1, 2010.)

(1) Copper UNS No. C10200 and C12000 for certain Types of tube added as covered in Specification B88.
(2) The Terminology section has been revised to reference B846 since the terms are now defined in the Terminology document.