Designation: B 698 – 02

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

This standard is issued under the fixed designation B 698; 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.

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 tubing, and is intended for use in water service distribution and drainage.

2. Referenced Documents

2.1 *ASTM Standards:*

B 42 Specification for Seamless Copper Pipe, Standard Sizes[3]

B 43 Specification for Seamless Red Brass Pipe, Standard Sizes[3]

B 88 Specification for Seamless Copper Water Tube[3]

B 88M Specification for Seamless Copper Water Tube [Metric][3]

B 302 Specification for Threadless Copper Pipe[3]

B 306 Specification for Copper Drainage Tube (DWV)[3]

B 846 Terminology for Copper and Copper Alloys[3]

E 527 Practice for Numbering Metals and Alloys (UNS)[4]

3. Terminology

3.1 *Definitions:*

3.1.1 The following definitions are used for purposes of classification:

3.1.1.1 *pipe, seamless, n*—a seamless tube conforming to the particular dimensions commercially known as Standard Pipe Sizes.

3.1.1.2 *threadless pipe, n*—a seamless tube conforming to particular dimensions commercially known as Threadless Pipe (TP).

3.1.1.3 *tube, seamless, n*—a tube produced with a continuous periphery in all stages of the operation.

3.1.1.4 *tube, seamless water, n*—a tube conforming to the particular dimensions of tube commercially known as copper water tube and designated as Types K, L, and M in inch-pound units and Types A, B, and C in SI units.

3.2 For definitions of general terms related to copper and copper alloys, refer to Terminology B 846.

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 or 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 E 527) 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] *Annual Book of ASTM Standards,* Vol 02.01.

[4] *Annual Book of ASTM Standards,* Vol 01.01.

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

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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
B 42	Seamless	copper pipe	plumbing and feed lines	⅛–12	X	X	X	X	X	
B 43	Seamless	red brass pipe	plumbing and feed lines	⅛–12						X
B 88	Seamless	K, L, M	general plumbing water tube	¼–12					X	
B 302	Seamless	TP	plumbing and feed lines	¼–12		X			X	
B 306	Seamless	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.
B 88M	Seamless	A, B, C	General plumbing water tube	6–308	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 (B 698 - 97) that may impact the use of this standard.

(*1*) Reference to B 88M was removed from Table 1 and included in new Table 2.
(*2*) Terminology B 846 was added to Section 2 and to the new section 3.2.
(*3*) Reference to SI Units was removed from Table 1 and included in new Table 2.
(*4*) Alloys C10800 and C12000 deleted from Table 1 for B 302.
(*5*) Oxygen limit added for Alloy C10200 in Table 2.
(*6*) Phosphorus range corrected for Alloy C10300 in Table 2.

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