Copper Development Association Inc.

Application Datasheet

Standard Designation for Wrought Copper Alloys

Revision Date: May 31, 2023

Coppers (C10100 - C15999)

* = are alloys registered with the U.S. EPA as Antimicrobial.

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C10100* Oxygen-Free-Electronic OFE	99.99 (1)(2)(3)			0.0005		0.0001		0.0010		0.0003				0.0025		0.0005				0.0005		0.0004		0.0002			active
C10200* Oxygen-Free OF	99.95 (4)(1)(5)																			0.0010							active
C10300* Oxygen-Free Copper OFXLP	99.95 (5)(6)								0.001	0.005																	active
C10400* Oxygen-Free with Ag OFS	99.95 (1)(5)(4)												0.027 (7)							0.0010							active
C10500* Oxygen-Free with Ag OFS	99.95 (1)(5)(4)												0.034 (8)							0.001							active
C10700* Oxygen-Free with Ag OFS	99.95 (5)(4)(1)												0.085 (9)							0.001							active
C10800* OFLP	99.95 (6)(5)								0.005	0.012																	active

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C10850 Oxygen-Free with Mg MOFC-HR	99.95 (10)(11)																								0.0020 Mg	0.0130 Mg	active
C10900* Oxygen-Free	99.99 (5)																									0.001 Bi	inactive 03/11
C10910*	99.95 (11)(5)																			0.005							active
C10920*	99.90 (5)																			0.02							active
C10930*	99.90 (5)												0.044 (12)							0.02							active
C10940*	99.90 (5)												0.085 (9)							0.02							active
C11000* Electrolytic Tough Pitch ETP	99.90 (13)(11)(5)																										active
C11010* Remelted High Conducivity RHC	99.90 (5)(13)(11)																										active
C11020* Fire-Refined High Conductivity FRHC	99.90 (11)(13)(5)																										active
C11025* Fire Refined High Conductivity FRHC	99.90 (14)(15)(5)		0.0150	0.0450		0.0080		0.0020						0.0150		0.0010			0.0100	0.0400		0.0050		0.0010			active
C11030* Chemically Refined Tough Pitch CRTP	99.90 (5)(11)(13)																										active
C11040*	99.90 (16)(17) (11)			0.0005				0.0010						0.0025		0.0005			0.0100	0.0650		0.0004		0.0002			active
C11045* ETP ETP	99.90 (18)(5)			0.0005				0.0010						0.0025		0.0005			0.0100	0.0650		0.0004		0.0002			active
C11050 ETP-R	99.90 (19)			0.0005				0.0030						0.0025		0.0005			0.0100	0.0650		0.0004		0.0002			active
C11080 Replaced by C13100	99.8 (5)																										inactive 03/92

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C11100* Electronic Tough Pitch, Anneal Resistant ETP	99.90 (20)(5)(11)																										active
C11300* Tough Pitch with Ag STP	99.90 (5)(13)(11)												0.027 (7)														active
C11400* Tough Pitch with Ag STP	99.90 (13)(5)(11)												0.034 (8)														active
C11500* Tough Pitch with Ag STP	99.90 (13)(11)(5)												0.054 (21)														active
C11600* Tough Pitch with Ag STP	99.90 (11)(5)(13)												0.085 (9)														active
C11700*	99.9 (5)(22)									0.04							0.004	0.02									active
C11900* Copper Alloy	99.93 (5)								0.002	0.010																	inactive 02/73
C11904* Copper Alloy	99.90 (5)												0.027 (23)														inactive 03/92
C11905* Copper Alloy	99.90 (5)												0.034 (8)														inactive 03/92
C11906	99.90												0.054														inactive
C11907* Copper Alloy	99.90 (5)												0.085 (9)														inactive 03/92
C12000* Phosphorus-Deoxidized, Low Residual P DLP	99.90 (5)								0.004	0.012																	active
C12100* Phosphorus-Deoxidized, Low Residual P DLPS	99.90 (5)								0.005	0.012			0.014 (24)														active

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C12200* Phosphorus-Deoxidized, High Residual P DHP	99.9 (25)(5)								0.015	0.040																	active
C12210*	99.90 (5)								0.015	0.025																	active
C12220*	99.9 (5)								0.040	0.065																	active
C12300* Phosphorus-Deoxidized, High Residual P DHPS	99.90 (5)								0.015	0.040				0.014 (24)													active
C12500* Fire-Refined Tough Pitch FRTP	99.88 (5)			0.004												0.012						0.003		0.025 (26)		0.050 Ni 0.003 Bi	active
C12510*	99.9 (5)			0.020		0.080		0.05		0.03												0.003		0.025 (26)		0.05 Sn 0.050 Ni 0.005 Bi	active
C12600	99.5 (5)								0.20	0.40																	active
C12700* Copper Alloy	99.88 (5)			0.004									0.027 (23)			0.012						0.003		0.025 (26)		0.050 Ni 0.003 Bi	inactive 03/92
C12800* Copper Alloy	99.76 (5)			0.004									0.034 (8)			0.012						0.003		0.025 (26)		0.050 Ni 0.003 Bi	inactive 03/92
C12900* Fire-Refined Tough Pitch with Ag FRSTP	99.88 (5)			0.004										0.054 (21)		0.012						0.003		0.025 (27)		0.050 Ni 0.003 Bi	active
C13000 Copper Alloy	99.88 (5)			0.004									0.085 (9)			0.012						0.003		0.025 (26)		0.05 Ni 0.003 Bi	inactive 03/92
C13100*	99.8 (5)																										active
C13150* Copper	99.5 (5)																										active
C13400* Copper Alloy	99.99 (5)									0.0005			0.027 (23)														inactive 12/72
C13500* Copper Alloy	99.99 (5)									0.0005			0.034 (8)														inactive 12/72

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C13600* Copper Alloy	99.99 (5)									0.0005			0.054 (21)														inactive 12/72
C13700* Copper Alloy	99.99 (5)									0.0005			0.085 (9)														inactive 12/72
C14100 Copper Alloy	99.40 (5)														0.15	0.50											inactive 07/74
C14180*	99.90 (5)			0.02						0.075		0.01															active
C14181*	99.90 (5)			0.002		0.002				0.002																0.005 C 0.002 Cd	active
C14200* Phosphorus-Deoxidized, Arsenical DPA	99.4 (5)								0.015	0.040					0.15	0.50											active
C14210* Copper Alloy	99.20 (5)								0.013	0.050					0.30	0.50											inactive 03/92
C14300* Cadmium Copper, Deoxidized	99.90 (5)(28)																								0.05 Cd	0.15 Cd	active
C14310* Cadmium Copper	99.90 (5)(28)																								0.10 Cd	0.30 Cd	inactive 03/92
C14400* Copper Alloy	99.90 (5)					0.05		0.03	0.013	0.025												0.003		0.02	0.10 Sn	0.20 Sn 0.05 Ni	inactive 03/92
C14410*	99.90 (29)(5)			0.05				0.05	0.005	0.020															0.10 Sn	0.20 Sn	active
C14415*	99.96 (29)																								0.10 Sn	0.15 Sn	active
C14420*	99.90 (5)(30)																						0.005	0.05	0.04 Sn	0.15 Sn	active
C14425 Copper Copper	99.97 (31)(5)			0.10		0.10		0.020		0.010															0.25 Sn	0.35 Sn 0.020 Ni (32)	active
C14430* Copper Alloy		Rem (5)																							0.25 Sn	0.35 Sn	inactive 03/92
C14435	99.4 (33)																			0.001					0.30 Sn	0.60 Sn	active
C14440* Copper Alloy	99.96 (5)																								0.005 Sn	0.01 Sn	inactive 03/92

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C14500* Tellurium-Bearing PTE	99.90 (34)(35)(5)								0.004	0.012													0.40	0.7			active
C14510* Tellurium-Bearing	99.85 (34)(5)			0.05					0.010	0.030													0.30	0.7			active
C14520* Phosphorus-Deoxidized,Tellurium-Bearing DPTE	99.90 (34)(5)								0.004	0.020													0.40	0.7			active
C14530*	99.90 (36)								0.001	0.010													0.003 (37)	0.023	0.003 Sn	0.023 Sn	active
C14700* Sulfur-Bearing	99.90 (5)(38)(35)								0.002 (38)	0.005															0.20 S	0.50 S (38)	active
C14710* Copper Alloy	99.90 (35)(39)			0.05 (39)					0.010 (39)	0.030															0.05 S	0.15 S (39)	inactive 03/92
C14720 Copper Alloy	99.50 (38)(35)(5)			0.1					0.010	0.030 (38)															0.20 S (38)	0.50 S	inactive 03/92
C14730 Sulfur Bearing Copper	99.80 (5)																										inactive 03/92
C14750* High Copper Alloy		Rem (5)(40)								0.012															0.05 Mn 0.20 S	0.50 Mn 0.50 S	active
C15000* Zirconium Copper		Rem (5)(41)																							0.10 Zr	0.20 Zr	active
C15100*	99.80 (41)(5)																								0.05 Zr	0.15 Zr	active
C15150*	99.90 (5)																								0.015 Zr	0.030 Zr	active
C15500*	99.75 (5)								0.040	0.080			0.027	0.10 (23)											0.08 Mg	0.13 Mg	active
C15600* Copper Alloy	99.6 (5)								0.06	0.09															0.20 Co	0.30 Co 0.02 Mg	active
C15630		Rem (42)							0.015	0.040															0.60 Ni	0.90 Ni	active
C15650* MA5J Copper	99.9 (5)								0.015	0.040															0.04 Co	0.06 Co	active
C15710* Copper Alloy	99.71 (5)			0.01				0.01			0.08	0.12							0.07	0.15							inactive 03/92

UNS #	Cu		Pb		Zn		Fe		P		Al		Ag		As		B		O		Sb		Te		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C15715* Dispersion Strengthened Alloy	99.62 (5)			0.01				0.01			0.13	0.17 (43)							0.12 (43)	0.19							active
C15720* Dispersion Strengthned Alloy	99.52 (5)			0.01				0.01			0.18 (43)	0.22							0.16	0.24 (43)							active
C15725* Dispersion Strengthened Alloy	99.43 (5)			0.01				0.01			0.23 (43)	0.27							0.20 (43)	0.28							active
C15730* Copper Alloy	98.94 (5)							0.04			0.26	0.34 (43)						0.22	0.32 (43)	0.46							active
C15735* Copper Alloy	99.24 (5)			0.01				0.01			0.33	0.37							0.29	0.37							inactive 03/92
C15750* Dispersion Strengthened Copper C3/60	98.56 (5)							0.04			0.42 (43)	0.50						0.22	0.52	0.68 (43)							active
C15760* Dispersion Strengthened Alloy	98.77 (5)			0.01				0.01			0.58 (43)	0.62							0.52	0.59 (43)							active
C15780* Copper Alloy	98.10 (5)							0.04			0.66 (43)	0.74						0.22	0.76 (43)	0.90							active
C15790* Copper Alloy	97.68 (5)							0.04			0.88 (43)	0.96						0.22	0.96 (43)	1.10							active
C15815* Dispersion Strengthened Alloy	97.82 (5)			0.01				0.01			0.13	0.17 (43)					1.2	1.8		0.19 (43)							active
C15900* Dispersion Strengthened Coper C3/11	97.51 (5)							0.04			0.76	0.84 (43)							0.40 (43)	0.54					0.27 C 0.66 Ti	0.33 C 0.74 Ti	active

* = are alloys registered with the U.S. EPA as Antimicrobial.

(1) = This is a high conductivity copper which has, in the annealed condition a minimum conductivity of 100% IACS except for Alloy C10100 which has a minimum conductivity of 101% IACS.

(2) = Cu is determined by the difference between the impurity total and 100 %. For alloy C10100 the Cu value is exclusive of Ag.

(3) = The following additional impurity maximum limits shall apply: Bi 1ppm (0.0001%); Cd 1ppm (0.0001%); Mn 0.5ppm (0.00005%); Ni 10ppm (0.0010%); Se 3ppm (0.0003%); S 15ppm (0.0015%); Sn 2ppm (0.0002).

(4) = Cu is determined by the difference between the impurity total and 100%.

(5) = Cu value includes Ag.

(6) = Includes P.

(7) = Ag 0.027% min is the equivalent of, Ag 8 Troy Oz min.

(8) = Ag 0.034% min is the equivelant of, Ag 10 Troy Oz min.

(9) = Ag 0.085% min is the equivelant of, Ag 25 Troy Oz min.

(10) = Cu + Sum of Named Elements, 99.95% min.

(11) = This is a high conductivity copper which has, in the annealed condition a minimum conductivity of 100% IACS.

(12) = Ag 0.044% min is the equivelant of, Ag 13 Troy Oz min.

(13) = Oxygen and trace elements may vary depending on the process.

(14) = The following additional maximum limits shall apply: Se 10 ppm (0.0010%); Bi 5 ppm (0.0005%); Sn 150 ppm (0.0150%); Ni 150 ppm (0.0150%); S 20 ppm (0.0020%); Cd 100 ppm (0.0100%).

(15) = The total maximum allowable of named elements is 750 ppm (0.0750%) not including oxygen.

(16) = Cu value is exclusive of Ag

(17) = The following additional maximum limits shall apply: Se 2ppm (0.0002%); Bi 1.0ppm (0.00010%); Group Total Te + Se +Bi 3ppm(0.0003%); Sn 5ppm (0.0005%); Ni 10ppm (0.0010%); S 15ppm (0.0015%). The total maximum allowable of named elements is 65 ppm (0.0065%) - does not include oxygen.

(18) = These total maximum limits shall apply; Se 2ppm(0.0002%); Bi 0.5ppm (0.00005%); Sn 5 ppm (0.0005%); Ni 10ppm (0.0010%); S 15 ppm (0.0015%).

(19) = The following additional impurity maximum limits shall apply: Bi 1 ppm (0.0015%); Ni 15 ppm (0.0015%); S 15 ppm (0.0015%); Se 2 ppm (0.0002%); Sn 15 ppm (0.0015%);

(20) = Small amounts of Cd or other elements may be added by agreement to improve the resistance to softening at elevated temperatures.

(21) = Ag 0.054% min is the equivelant of, Ag 16 Troy Oz min.

(22) = Includes B + P.

(23) = Ag 0.027 - 0.10% min is the equivalent of, Ag 8 - 30 Troy Oz min.

(24) = Ag 0.014% min is the equivalent of, Ag 4 Troy Oz min.

(25) = This includes oxygen-free Cu which contains P in an amount agreed upon.

(26) = 0.025 Te + Se.

(27) = Includes Te + Se.

(28) = Includes Cd. Deoxidized with Li or other suitable elements as agreed upon.

(29) = Includes Cu + Ag + Sn.

(30) = Includes Te + Sn.

(31) = Cu + Sum of Named Elements, 99.97% Min.

(32) = Includes Co.

(33) = Cu + Sum of Named Elements 99.7% min.

(34) = Includes Te + P.

(35) = Includes oxygen-free or deoxidized grades with deoxidizers (such as phosphorus boron lithium or others in an amount agreed upon.

(36) = Includes Ag + Sn + Te + Se

(37) = Tellurium and/or Selenium

(38) = Includes Cu + S + P.

(39) = Includes Ag, S, P, and Pb

(40) = Cu + Sum of Named Elements 99.8% min.

(41) = Cu + Sum of Named Elements 99.9% min.

(42) = Cu + Sum of Named Elements 99.5% min.

(43) = All aluminum present as Al_2O_3; 0.04% oxygen present as Cu_2O with a negligible amount in solid solution with copper.