



# Application Datasheet

## Standard Designation for Wrought Copper Alloys

Revision Date: November 13, 2018

### High Copper Alloys (C16000 - C19999)

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

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%		
C16200* Cadmium Copper		Rem <sup>(1)(2)</sup>							0.02																0.7 Cd	1.2 Cd	active	
C16210* High Copper Alloy		Rem <sup>(1)(2)</sup>																							0.50 Cd	1.20 Cd	inactive 03/92	
C16400* High Copper Alloy	99.8 <sup>(2)</sup>				0.20	0.40			0.02																0.6 Cd	0.9 Cd	inactive 07/74	
C16500*		Rem <sup>(1)(2)</sup>			0.50	0.7			0.02																0.6 Cd	1.0 Cd	active	
C17000* Beryllium Copper		Rem <sup>(2)(1)</sup>												0.20	1.60	1.85	0.20 <sup>(3)</sup>						0.20					active
C17200* Beryllium Copper		Rem <sup>(1)(2)</sup>												0.20	1.80	2.00	0.20 <sup>(3)</sup>						0.20					active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%	
C17300 Beryllium Copper		Rem <sup>(1)(2)</sup>	0.20	0.6											0.20	1.80	2.00	0.20 <sup>(3)</sup>					0.20				active
C17400* Beryllium Copper		Rem <sup>(2)(1)</sup>								0.20 <sup>(3)</sup>					0.20	0.15	0.50	0.15	0.35 <sup>(3)</sup>				0.20				inactive 03/92
C17410* Beryllium Copper		Rem <sup>(1)(2)</sup>								0.20					0.20	0.15	0.50	0.35	0.6				0.20				active
C17420* Beryllium Copper		Rem <sup>(2)</sup>								0.20					0.20	0.05	0.15	0.05	0.6				0.20				inactive 03/92
C17450* Beryllium Copper		Rem <sup>(1)(2)</sup>				0.25				0.20			0.50	1.0	0.20	0.15	0.50						0.20		0.50 Zr	active	
C17455 Beryllium Copper		Rem <sup>(1)(2)</sup>	0.20	0.6		0.25				0.20			0.50	1.0 <sup>(4)</sup>	0.20	0.15	0.50						0.20		0.50 Zr	active	
C17460* Beryllium Copper		Rem <sup>(1)(2)</sup>				0.25				0.20			1.0	1.4	0.20	0.15	0.50						0.20		0.50 Zr	active	
C17465 Beryllium Copper		Rem <sup>(1)(2)</sup>	0.20	0.6		0.25				0.20			1.0 <sup>(4)</sup>	1.4	0.20	0.15	0.50						0.20		0.50 Zr	active	
C17500* Beryllium Copper		Rem <sup>(2)(1)</sup>								0.10					0.20	0.4	0.7	2.4	2.7				0.20			active	
C17510* Beryllium Copper		Rem <sup>(1)(2)</sup>								0.10			1.4	2.2	0.20	0.2	0.6		0.3				0.20			active	
C17520* Beryllium Copper		Rem <sup>(2)</sup>											0.50	1.5		0.10	0.30							0.06 Mg 0.10 Zr	0.30 Mg 0.30 Zr	inactive 03/92	

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%		
C17530* Beryllium Copper		Rem <sup>(2)(1)</sup>								0.20			1.8 <sup>(4)</sup>	2.5		0.6	0.20	0.40							0.20			active
C17540 CW103C		Rem <sup>(2)(1)</sup>								0.2			0.8	1.3			0.4	0.7	0.8	1.3					0.2			active
C17600* Beryllium Copper		Rem <sup>(2)</sup>								0.10						0.20	0.25	0.50	1.4	1.7					0.9 Ag	1.1 Ag	inactive 03/92	
C17700* Beryllium Copper		Rem <sup>(2)</sup>								0.10							0.40	0.70	2.4	2.7				0.20	0.40 Te	0.6 Te	inactive 03/92	
C18000		Rem <sup>(1)(2)</sup>								0.15			1.8	3.0 <sup>(4)</sup>							0.10	0.8	0.40	0.8				active
C18020		Rem <sup>(2)(5)</sup>			0.05	0.25	0.10	0.30													0.10	0.30		0.05				active
C18025 High Copper Alloy		Rem <sup>(2)(5)</sup>			0.15	0.25	0.05	0.15													0.20	0.30	0.03	0.07	0.01 Mg	0.03 Mg		active
C18030		Rem <sup>(2)(5)</sup>			0.08	0.12						0.005	0.015								0.10	0.20						active
C18040		Rem <sup>(6)(2)</sup>			0.20	0.30	0.05	0.15				0.005	0.015								0.25	0.35						active
C18045	99.1 <sup>(5)(2)</sup>				0.20	0.30	0.15	0.30													0.20	0.35		0.05				active
C18050		Rem <sup>(2)(7)</sup>																			0.05	0.15			0.005 Te	0.015 Te		active
C18060		Rem <sup>(5)</sup>				0.10												0.01	0.15	0.20	0.40	0.01	0.15	0.01 Mg	.15 Mg		active	
C18070	99.0 <sup>(2)(7)</sup>																				0.15	0.40	0.02	0.07	0.01 Ti	0.40 Ti		active
C18080		Rem <sup>(8)(7)</sup>							0.02	0.20											0.20	0.7	0.01	0.10	0.01 Ag 0.01 Ti	0.30 Ag 0.15 Ti		active
C18090	96.0 <sup>(9)(2)</sup>				0.50	1.2							0.30	1.2							0.20	1.0			0.15 Ti	0.8 Ti		active
C18100	98.7 <sup>(2)(1)</sup>																				0.40	1.2			0.03 Mg 0.08 Zr	0.06 Mg 0.20 Zr		active
C18135		Rem <sup>(2)(1)</sup>																			0.20	0.6			0.20 Cd	0.6 Cd		active
C18140		Rem <sup>(2)(1)</sup>																			0.15	0.45	0.005	0.05	0.05 Zr	0.25 Zr		active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%		
C18141 High Copper Alloy MZC1		Rem <sup>(2)(1)</sup>				0.20										0.10						0.20	0.40	0.01	0.03	0.002 Mg 0.07 Zr	0.05 Mg 0.13 Zr	active
C18142		Rem <sup>(1)(10)</sup>																				0.20	0.30			0.05 Mg	0.30 Mg	active
C18143 High Copper		Rem <sup>(2)(1)</sup>				0.20										0.10						0.20	0.40	0.01	0.03	0.07 Zr	0.05 Mn 0.13 Zr	active
C18145		Rem <sup>(1)(2)</sup>					0.10	0.30														0.10	0.30			0.05 Zr	0.15 Zr	active
C18150		Rem <sup>(11)(2)</sup>																				0.50	1.5			0.02 Zr	0.20 Zr	active
C18160		Rem <sup>(11)(10)</sup>									0.10											0.20	1.20		0.10	0.05 Zr	0.25 Zr	active
C18200 Chromium Copper		Rem <sup>(1)(2)</sup>		0.05							0.10											0.6	1.2		0.10			active
C18400 Chromium Copper		Rem <sup>(2)(1)</sup>					0.7			0.15		0.05										0.40	1.2		0.10	0.005 As 0.005 Ca 0.05 Li		active
C18500 High Copper		Rem <sup>(2)</sup>		0.015								0.04										0.40	1.0			0.08 Ag	0.12 Ag	inactive 03/92
C18550 Chromium Copper		Rem <sup>(2)</sup>			0.10	0.14																0.6	1.0					inactive 03/92
C18600		Rem <sup>(2)(1)</sup>							0.25	0.8			0.25							0.10	0.10	1.0			0.05 Ti 0.05 Zr	0.50 Ti 0.40 Zr	active	
C18610		Rem <sup>(2)(1)</sup>							0.10				0.25						0.25	0.8	0.10	1.0			0.05 Ti 0.05 Zr	0.50 Ti 0.40 Zr	active	
C18620* High Copper	99.40 <sup>(2)</sup>				0.03	0.15	0.02	0.10			0.040	0.075	0.02	0.06						0.14	0.21							active
C18625* HRSC	99.40 <sup>(2)(1)</sup>				.01	.10		.10			.05	.09		.10						.15	.35							active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%	
C18660* High Copper Alloy		Rem <sup>(5)(2)</sup>				0.08			0.10	0.15	0.03	0.08									0.01	0.02	0.01	0.02	0.03 Mg	0.07 Mg	active
C18661*		Rem <sup>(1)(2)</sup>				0.20			0.10		0.001	0.02													0.10 Mg	0.7 Mg	active
C18665*	99.0 <sup>(2)</sup>										0.002	0.04													0.40 Mg	0.9 Mg	active
C18670 MSP5		Rem <sup>(1)(2)</sup>																							1.2 Mg	1.9 Mg	active
C18700 Free-Machining Cu	99.5 <sup>(2)(12)</sup>		0.8	1.5																							active
C18835*	99.0 <sup>(1)(2)</sup>			0.05	0.15	0.55		0.30		0.10		0.01															active
C18900*		Rem <sup>(1)(2)</sup>		0.02	0.6	0.9		0.10				0.05			0.01								0.15	0.40	0.10 Mn	0.30 Mn	active
C18910*		Rem <sup>(2)</sup>										0.15												0.50	0.50 Mn	inactive 12/98	
C18980* <sup>(1)</sup>	98.0 <sup>(2)</sup>			0.02		1.0						0.15												0.50	0.50 Mn	active	
C18990		Rem <sup>(5)(2)</sup>			1.8	2.2					0.005	0.015									0.10	0.20					active
C19000*		Rem <sup>(2)(1)</sup>		0.05				0.8		0.10	0.15	0.35	0.9	1.3													active
C19002*		Rem <sup>(2)(1)</sup>		0.05	0.02	0.30	0.01	0.35		0.10		0.05	1.4	1.7 <sup>(4)</sup>									0.20	0.35	0.02 Ag 0.005 Zr	0.50 Ag 0.01 Mg 0.05 Zr	active
C19005		Rem <sup>(1)(2)</sup>		0.05	0.02	0.30	0.20	0.7		0.10		0.05	1.4 <sup>(4)</sup>	1.7									0.20	0.35	0.50 Ag 0.01 Mg 0.08 Zr	0.50 Ag 0.01 Mg 0.08 Zr	active
C19010*		Rem <sup>(2)(1)</sup>									0.01	0.05	0.8	1.8									0.15	0.35			active
C19015*		Rem <sup>(7)(2)</sup>									0.02	0.20	0.50	2.4									0.10	0.40	0.02 Mg	0.15 Mg	active
C19020*		Rem <sup>(7)(2)</sup>			0.30	0.9					0.01	0.20	0.50	3.0													active
C19022* High Copper Alloy		Rem <sup>(1)(2)</sup>		0.009	0.3	1.0		0.2		0.04	0.01	0.07	0.3	1.0 <sup>(4)</sup>													active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%	
C19024* High Copper Alloy		Rem <sup>(5)(2)</sup>		0.01	.02	0.8		0.05		0.02	0.008	0.05	0.10	0.6													active
C19025*		Rem <sup>(2)(11)</sup>			0.7	1.1		0.20		0.10	0.03	0.07	0.8	1.2													active
C19027* NB 115 High Copper		Rem <sup>(11)(2)</sup>			1.20	1.80		0.20		0.10	0.03	0.15	0.50	1.20											0.20 Mg	active	
C19030*		Rem <sup>(2)(11)</sup>		0.02	1.0	1.5				0.10	0.01	0.03	1.5	2.0													active
C19040* CAC5 High Copper	96.1 <sup>(2)(7)</sup>			0.02	1.0	2.0		0.8		0.06	0.02	0.09	0.7	0.9 <sup>(4)</sup>										0.010	0.02 Mn	active	
C19050* SPKFC-5E High Copper	95.1 <sup>(2)(7)</sup>			0.02	0.8	2.5		1.0	0.05	0.15	0.08	0.20	0.50 <sup>(4)</sup>	1.0													active
C19100		Rem <sup>(1)(2)</sup>		0.10				0.50		0.20	0.15	0.35	0.9	1.3											0.35 Te	0.6 Te	active
C19140		Rem <sup>(1)(2)</sup>	0.40	0.8		0.05		0.50		0.05	0.15	0.35	0.8	1.2													active
C19150		Rem <sup>(1)(2)</sup>	0.50	1.0		0.05				0.05	0.15	0.35	0.8	1.2													active
C19160		Rem <sup>(2)(1)</sup>	0.8	1.2		0.05		0.50		0.05	0.15	0.35	0.8	1.2													active
C19170* KLF170 High Copper	96.8 <sup>(7)(2)</sup>			0.02		0.8		1.0	0.05	0.15	0.08	0.20	0.50 <sup>(4)</sup>	1.0										0.010			active
C19200*	98.5 <sup>(7)</sup>							0.20	0.8	1.2	0.01	0.04															active
C19210*		Rem <sup>(7)</sup>								0.05	0.15	0.025	0.04														active
C19215*		Rem <sup>(7)</sup>					1.1	3.5	0.05	0.20	0.025	0.050															active
C19217		Rem <sup>(13)</sup>							0.09	0.20	0.05	0.09												0.05 Mn	0.20 Mn	active	
C19220*		Rem <sup>(7)</sup>			0.05	0.10			0.10	0.30	0.03	0.07	0.10	0.25										0.005 B	0.015 B	active	
C19240* Super KFC	97.5 <sup>(7)</sup>			0.02		0.8		1.0	0.15	0.45	0.04	0.20												0.010	0.020 Mn	active	

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C19250* SPKFC-5W High Copper	95.8 <sup>(2)(7)</sup>			0.02	0.8	2.5		1.0	0.15	0.45	0.04	0.20												0.010		0.02 Mn	active	
C19260*	98.5 <sup>(5)</sup>								0.40	0.8															0.02 Mg 0.20 Ti	0.15 Mg 0.40 Ti	active	
C19280*		Rem <sup>(7)</sup>			0.30	0.7	0.30	0.7	0.50	1.5	0.005	0.015															active	
C19300* High Copper Alloy	92.0	94.0		0.003		0.03		Rem	2.05	2.60					0.02												inactive 08/73	
C19400*	97.0			0.03			0.05	0.20	2.1	2.6	0.015	0.15															active	
C19410*		Rem <sup>(7)</sup>			0.6	0.9	0.10	0.20	1.8	2.3	0.015	0.050															active	
C19419* CAC19 High Copper	96.7 <sup>(7)(2)</sup>			0.02	0.05	0.18	0.10	0.40	1.7	2.3		0.03		0.04 <sup>(4)</sup>										0.03	0.09		0.04 Mn	active
C19450*		Rem <sup>(7)</sup>			0.8	2.5			1.5	3.0	0.005	0.05															active	
C19500*	96.0 <sup>(7)</sup>			0.02	0.10	1.0		0.20	1.0	2.0	0.01	0.35			0.02				0.30	1.3							active	
C19520	96.6 <sup>(7)</sup>		0.01	3.5					0.50	1.5																	active	
C19600* High Copper Alloy		Rem						0.35	0.9	1.2	0.25	0.35															inactive 03/92	
C19700*		Rem <sup>(7)</sup>		0.05		0.20		0.20	0.30	1.2	0.10	0.40		0.05					0.05						0.01 Mg 0.20 Mg 0.05 Mn		active	
C19710*		Rem <sup>(1)</sup>		0.05		0.20		0.20	0.05	0.40	0.07	0.15		0.10 <sup>(4)</sup>											0.03 Mg 0.06 Mg 0.05 Mn		active	
C19720*		Rem <sup>(1)</sup>		0.05		0.20		0.20	0.05	0.50	0.05	0.15		0.10 <sup>(4)</sup>											0.06 Mg 0.20 Mg 0.05 Mn		active	
C19750*		Rem <sup>(7)</sup>		0.05	0.05	0.40		0.20	0.35	1.2	0.10	0.40		0.05					0.05						0.01 Mg 0.20 Mg 0.05 Mn		active	
C19800*		Rem <sup>(7)</sup>			0.10	1.0	0.30	1.5	0.02	0.50	0.01	0.10													0.10 Mg 1.0 Mg		active	

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Be		Co		Cr		Si		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%	
C19810* Hig Copper Alloy		Rem <sup>(7)</sup>					1.0	5.0	1.5	3.0		0.10										0.09				0.10 Mg 0.10 Ti 0.10 Zr	active
C19900*		Rem <sup>(1)</sup>																							2.9 Ti	3.5 Ti	active
C19910* NKT 322 High Copper		Rem <sup>(1)</sup>							0.17	0.23															2.9 Ti	3.4 Ti	active

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

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

(2) = Cu value includes Ag.

(3) = Ni + Co 0.20% min.: Ni + Fe + Co 0.6% max.

(4) = Ni value includes Co.

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

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

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

(8) = Not including Ag.

(9) = Cu + Sum of Named Elements 99.85% min.

(10) = Includes Ag.

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

(12) = Includes Pb.

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