



# Application Datasheet

## Standard Designation for Cast Copper Alloys

- C90000-C91999: Copper-Tin Alloys (*Tin Bronzes*)
- C92000-C92900: Copper-Tin-Lead Alloys (*Leaded Tin Bronzes*)
- C93000-C94500: Copper-Tin-Lead Alloys (*High-Leaded Tin Bronzes*)
- C94600-C94999: Copper-Tin-Nickel Alloys (*Nickel-Tin Bronzes*)
- C95000-C95999: Copper-Aluminum-Iron and Copper-Aluminum-Iron-Nickel Alloys (*Aluminium Bronzes*)

Revision Date: November 29, 2017

### Bronzes (C90000 - C95999)

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

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Mg		Mn		S		Sb		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%	Min%	Max%		
C90200	91.0 <sup>(1)</sup> (2)	94.0		0.30	6.0	8.0		0.50		0.20		0.05 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90250 Tin Bronze	89.0	91.0		0.30	9.0	11.0		0.50		0.25		0.05		2.0		0.005				0.20		0.05		0.02		0.005				inactive 03/92
C90280*	87.0	90.0 <sup>(5)</sup>		.09	9.0	11.0			.30	.6		.05									.30	.6								active
C90300 Tin Bronze	86.0	89.0 <sup>(1)(2)</sup>		0.30	7.5	9.0	3.0	5.0		0.20		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90400* Tin Bronze	86.0 <sup>(6)</sup>	89.0		0.09	7.5	8.5	1.0	5.0		0.40		0.05		1.0		0.005				0.01	0.10	0.65		0.02		0.005		0.10 B 0.10 Zr	active	
C90410* Tin Bronze	86.0	89.0 <sup>(6)</sup>		0.09	7.5	8.5	1.0	5.0		0.40		0.05		1.0		0.005				0.01	0.20	0.10	0.65		0.02		0.005		0.10 B 0.10 Zr	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Mg		Mn		S		Sb		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%	Min%	Max%		
C90420* Tin Bronze	86.0 <sup>(6)</sup>	89.0		0.09	7.5	8.5	1.0	5.0		0.40		0.05		1.0						0.20	0.10	0.65		0.02					0.10 B 0.10 C 0.10 Ti 0.10 Zr	active
C90430* Low-Lead Tin Bronze	86.0 <sup>(6)</sup>	89.0		0.09	7.5	8.5	1.0	5.0		0.40		0.05		1.0						0.20	0.10	0.65	0.10	1.5					0.10 B 0.10 C 0.10 Ti 0.10 Zr	active
C90500 Gun Metal	86.0	89.0 <sup>(7)(1)</sup>		0.30	9.0	11.0	1.0	3.0		0.20		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90700 Tin Bronze, 65	88.0	90.0 <sup>(2)(1)</sup>		0.50	10.0	12.0		0.50		0.15		0.30 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90710		Rem <sup>(1)</sup> <sub>(2)</sub>		0.25	10.0	12.0		0.05		0.10		0.05 <sup>(3)</sup>	1.2	0.10 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90800 Tin Bronze	85.0	89.0 <sup>(2)(1)</sup>		0.25	11.0	13.0		0.25		0.15		0.30 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90810		Rem <sup>(2)</sup> <sub>(1)</sub>		0.25	11.0	13.0		0.30		0.15	0.15	0.8 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C90900	86.0 <sup>(1)</sup> <sub>(2)</sub>	89.0		0.25	12.0	14.0		0.25		0.15		0.05 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C91000	84.0 <sup>(2)</sup> <sub>(1)</sub>	86.0		0.20	14.0	16.0		1.5		0.10		0.05 <sup>(3)</sup>		0.8 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C91100	82.0 <sup>(1)</sup> <sub>(2)</sub>	85.0		0.25	15.0	17.0		0.25		0.25		1.0 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C91300	79.0 <sup>(2)</sup> <sub>(1)</sub>	82.0		0.25	18.0	20.0		0.25		0.25		1.0 <sup>(3)</sup>		0.50 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C91500 Copper Tin Alloy		Rem	2.0	3.2	9.0	11.0						0.50	2.8	4.0																inactive 01/73
C91600	86.0	89.0 <sup>(2)(1)</sup>		0.25	9.7	10.8		0.25		0.20		0.30 <sup>(3)</sup>	1.2	2.0 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C91700 Nickel Gear Bronze	84.0 <sup>(2)</sup> <sub>(1)</sub>	87.0		0.25	11.3	12.5		0.25		0.20		0.30 <sup>(3)</sup>	1.2 <sup>(4)</sup>	2.0		0.005						0.05		0.20		0.005				active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Mg		Mn		S		Sb		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%	Min%	Max%		
C92200 Navy M Bronze	86.0 <sup>(1)</sup> (6)	90.0	1.0	2.0	5.5	6.5	3.0	5.0		0.25		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92210	86.0	89.0 <sup>(1)(6)</sup>	1.7	2.5	4.5	5.5	3.0	4.5		0.25		0.03 <sup>(3)</sup>	0.7	1.0 <sup>(4)</sup>		0.005						0.05		0.20		0.005				active
C92220 <sup>(6)</sup>	86.0 <sup>(1)</sup>	88.0	1.5	2.5	5.0	6.0	3.0	5.5		0.25		0.05 <sup>(3)</sup>	0.50 <sup>(4)</sup>	1.0																active
C92300 Leaded Tin Bronze	85.0 <sup>(6)</sup> (1)	89.0	0.30	1.0	7.5	9.0	2.5	5.0		0.25		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92310		Rem <sup>(6)</sup> (1)	0.30	1.5	7.5	8.5	3.5	4.5						1.0 <sup>(4)</sup>		0.005				0.03						0.005				active
C92400	86.0 <sup>(1)</sup> (6)	89.0	1.0	2.5	9.0	11.0	1.0	3.0		0.25		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92410		Rem <sup>(1)</sup> (6)	2.5	3.5	6.0	8.0	1.5	3.0		0.20				0.20 <sup>(4)</sup>		0.005				0.05				0.25		0.005				active
C92500	85.0	88.0 <sup>(6)(1)</sup>	1.0	1.5	10.0	12.0		0.50		0.30		0.30 <sup>(3)</sup>	0.8	1.5 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92600 <sup>(6)</sup>	86.0 <sup>(1)</sup>	88.5	0.8	1.5	9.3	10.5	1.3	2.5		0.20		0.03 <sup>(3)</sup>		0.7 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92610		Rem <sup>(1)</sup> (6)	0.30	1.5	9.5	10.5	1.7	2.8		0.15				1.0 <sup>(4)</sup>		0.005				0.03						0.005				active
C92700 Leaded Tin Bronze	86.0	89.0 <sup>(6)(1)</sup>	1.0	2.5	9.0	11.0		0.7		0.20		0.25 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92710		Rem <sup>(6)</sup> (1)	4.0	6.0	9.0	11.0		1.0		0.20		0.10 <sup>(3)</sup>		2.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92800	78.0 <sup>(6)</sup> (1)	82.0	4.0	6.0	15.0	17.0		0.8		0.20		0.05 <sup>(3)</sup>		0.8 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92810	78.0	82.0 <sup>(1)(6)</sup>	4.0	6.0	12.0	14.0		0.50		0.50		0.05 <sup>(3)</sup>	0.8	1.2 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C92900	82.0	86.0 <sup>(6)(1)</sup>	2.0	3.2	9.0	11.0		0.25		0.20		0.50 <sup>(3)</sup>	2.8	4.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active
C93100		Rem <sup>(8)</sup> (1)	2.0	5.0	6.5	8.5		2.0		0.25		0.30 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.05		0.25		0.005				active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Mg		Mn		S		Sb		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%	Min%	Max%		
C93200	81.0	85.0 <sup>(8)(1)</sup>	6.0	8.0	6.3	7.5	1.0	4.0		0.20		0.15 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08		0.35		0.005				active
C93400	82.0 <sup>(1)</sup> <sub>(8)</sub>	85.0	7.0	9.0	7.0	9.0		0.8		0.20		0.50 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08		0.50		0.005				active
C93500	83.0 <sup>(1)</sup> <sub>(8)</sub>	86.0	8.0	10.0	4.3	6.0		2.0		0.20		0.05 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08		0.30		0.005				active
C93600	79.0	83.0 <sup>(6)</sup>	11.0	13.0	6.0	8.0		1.0		0.20		0.15 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08		0.55		0.005				active
C93700 Bearing Bronze	78.0 <sup>(8)</sup>	82.0	8.0	11.0	9.0	11.0		0.8		0.7 <sup>(9)</sup>		0.10 <sub>(3)</sub>		0.50 <sub>(4)</sub>		0.005						0.08		0.50		0.005				active
C93720	83.0 <sup>(8)</sup>		7.0	9.0	3.5	4.5		4.0		0.7		0.10 <sub>(3)</sub>		0.50 <sub>(4)</sub>									0.50							active
C93800 Anti-acid Metal	75.0 <sup>(8)</sup>	79.0	13.0	16.0	6.3	7.5		0.8		0.15		0.05 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08		0.8		0.005				active
C93900 79-6-15	76.5	79.5 <sup>(10)</sup>	14.0	18.0	5.0	7.0		1.5		0.40		1.5 <sup>(3)</sup>		0.8 <sup>(4)</sup>		0.005						0.08		0.50		0.005				active
C94000	69.0	72.0 <sup>(11)</sup>	14.0	16.0	12.0	14.0		0.50		0.25		0.05 <sub>(3)</sub>	0.50	1.0 <sup>(4)</sup>		0.005						0.08 <sub>(12)</sub>		0.50		0.005				active
C94100	72.0 <sup>(11)</sup>	79.0	18.0	22.0	4.5	6.5		1.0		0.25		0.50 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08 <sub>(12)</sub>		0.8		0.005				active
C94200 Cast High- Leaded Tin Bronze	68.5	75.5	3.0	4.0	3.0	4.0		3.0		0.35				0.50										0.50						inactive 03/92
C94300 Soft Bronze	67.0	72.0 <sup>(8)</sup>	23.0	27.0	4.5	6.0		0.8		0.15		0.08 <sub>(3)</sub>		1.0 <sup>(4)</sup>		0.005						0.08 <sub>(12)</sub>		0.8		0.005				active
C94310		Rem <sup>(8)</sup>	27.0	34.0	1.5	3.0		0.50		0.50		0.05 <sub>(3)</sub>	0.25 <sub>(4)</sub>	1.0										0.50						active
C94320		Rem <sup>(8)</sup>	24.0	32.0	4.0	7.0				0.35																				active
C94330	68.5 <sup>(8)</sup>	75.5	21.0	25.0	3.0	4.0		3.0		0.7		0.10 <sub>(3)</sub>		0.50 <sub>(4)</sub>									0.50							active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Mg		Mn		S		Sb		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%	Min%	Max%		
C94400		Rem <sup>(8)</sup>	9.0	12.0	7.0	9.0		0.8		0.15		0.50 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.08		0.8		0.005				active
C94500		Rem <sup>(8)</sup>	16.0	22.0	6.0	8.0		1.2		0.15		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005						0.08		0.8		0.005				active
C94700* Cast Nickel-Tin Bronze	85.0	90.0 <sup>(11)</sup>		0.09 <sup>(13)</sup>	4.5	6.0	1.0	2.5		0.25		0.05	4.5 <sup>(4)</sup>	6.0		0.005					0.20		0.05		0.15		0.005			active
C94800	84.0 <sup>(11)</sup>	89.0	0.30	1.0	4.5	6.0	1.0	2.5		0.25		0.05	4.5	6.0 <sup>(4)</sup>		0.005					0.20		0.05		0.15		0.005			active
C94900	79.0 <sup>(2)</sup>	81.0	4.0	6.0	4.0	6.0	4.0	6.0		0.30		0.05	4.0	6.0 <sup>(4)</sup>		0.005					0.10		0.08		0.25		0.005			active
C95200*	86.0 <sup>(8)</sup>									2.5	4.0					8.5	9.5													active
C95210*	86.0 <sup>(8)</sup>			0.05		0.10		0.50	2.5	4.0				1.0 <sup>(4)</sup>	8.5	9.5		0.05		1.0						0.25			active	
C95220*		Rem <sup>(5)</sup>							2.5	4.0				2.5 <sup>(4)</sup>	9.5	10.5					0.50									active
C95300*	86.0 <sup>(8)</sup>								0.8	1.5					9.0	11.0														active
C95400*	83.0 <sup>(5)</sup>								3.0	5.0				1.5 <sup>(4)</sup>	10.0	11.5					0.50									active
C95410*	83.0 <sup>(5)</sup>								3.0	5.0			1.5	2.5 <sup>(4)</sup>	10.0	11.5					0.50									active
C95420*	83.5 <sup>(5)</sup>								3.0	4.3				0.50 <sup>(4)</sup>	10.5	12.0					0.50									active
C95430* Copper Aluminum Iron Alloy		Rem												0.50	10.5	12.0					0.50									inactive 03/92
C95500*	78.0 <sup>(5)</sup>								3.0	5.0			3.0	5.5 <sup>(4)</sup>	10.0	11.5					3.5									active
C95510*	78.0 <sup>(14)</sup>					0.20		0.30	2.0	3.5			4.5	5.5 <sup>(4)</sup>	9.7	10.9					1.5									active
C95520*	74.5 <sup>(5)</sup>			0.03		0.25		0.30	4.0	5.5			4.2	6.0 <sup>(4)</sup>	10.5	11.5					1.5					0.15		0.20 Co 0.05 Cr	active	
C95600*	88.0 <sup>(8)</sup>													0.25 <sup>(4)</sup>	6.0	8.0									1.8	3.2			active	
C95700*	71.0 <sup>(5)</sup>								2.0	4.0			1.5 <sup>(4)</sup>	3.0	7.0	8.5				11.0	14.0					0.10			active	
C95710*	71.0 <sup>(5)</sup>			0.05		1.0		0.50	2.0	4.0		0.05	1.5 <sup>(4)</sup>	3.0	7.0	8.5				11.0	14.0					0.15			active	

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		Mg		Mn		S		Sb		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%	Min%	Max%	
C95720* Copper Aluminum Iron Alloy	73.0 <sup>(5)</sup>			0.03		0.10		0.10	1.5	3.5			3.0 <sup>(4)</sup>	6.0	6.0	8.0			12.0	15.0						0.10		0.09 Cr	active
C95800*	79.0 <sup>(5)</sup>			0.03					3.5 <sup>(15)</sup>	4.5			4.0	5.0 <sup>(15)</sup>	8.5	9.5			0.8	1.5						0.10			active
C95810* Cast Aluminum Bronze	79.0 <sup>(5)</sup>			0.09			0.50	3.5 <sup>(15)</sup>	4.5				4.0 <sup>(15)</sup>	5.0	8.5	9.5	0.05		0.8	1.5						0.10			active
C95820*	77.5 <sup>(16)</sup>			0.02		0.20	0.20	4.0	5.0				4.5	5.8 <sup>(4)</sup>	9.0	10.0				1.5						0.10			active
C95900*		Rem <sup>(5)</sup>						3.0	5.0					0.50 <sup>(4)</sup>	12.0	13.5				1.5									active

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(1) = In determining Cu min., Cu may be calculated as Cu + Ni.

(2) = Cu + Sum of Named Elements 99.4% min.

(3) = For continuous castings P shall be 1.5% max.

(4) = Ni value includes Co.

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

(6) = Cu + Sum of Named Elements 99.3% min.

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

(8) = Cu + Sum of Named Elements 99.0% min.

(9) = Fe shall be 0.35% max. when used for steel-backed bearings

(10) = Cu + Sum of Named Elements 98.9% min.

(11) = Cu + Sum of Named Elements 98.7% min.

(12) = For continuous castings S shall be 0.25% max.

(13) = The mechanical properties of C94700 (heat treated) may not be attainable if the Pb content exceeds 0.01%.

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

(15) = Fe content shall not exceed Ni content.

(16) = Cu + Sum of Named Elements 99.2% min.