



# Application Datasheet

## Standard Designation for Cast Copper Alloys

- C83300-C83999: Copper-Tin-Zinc and Copper-Tin-Zinc-Lead Alloys (*Red and Leaded Red Brasses*)
- C84000-C84999: Copper-Tin-Zinc and Copper-Tin-Zinc-Lead Alloys (*Semi-Red and Leaded Semi-Red Brasses*)
- C85000-C85999: Copper-Zinc Alloys (*Yellow Brasses*)
- C86000-C86999: Manganese Bronze and Leaded Manganese Bronze Alloy (*High Strength Yellow Brasses*)
- C87000-C87999: Copper-Silicon Alloys (*Silicon Bronzes and Silicon Brasses*)
- C88000-C89999: Copper-Bismuth and Copper-Bismuth-Selenium Alloys

Revision Date: November 13, 2018

### Brasses (C83300 - C89999)

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

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%			
C83300	92.0 <sup>(1)(2)</sup>	94.0	1.0	2.0	1.0	2.0	2.0	6.0																											active
C83400	88.0	92.0 <sup>(2)(1)</sup>		0.50		0.20	8.0	12.0		0.25		0.03 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005					active
C83410 Red Brass	88.0	91.0		0.10	1.0	2.0		Rem		0.05				0.05		0.005																			inactive 03/92
C83420 Red Brass	88.0 <sup>(1)(2)</sup>	92.0		0.50	0.25	0.7		Rem		0.10																									inactive 03/92
C83450	87.0 <sup>(2)(1)</sup>	89.0	1.5	3.0	2.0	3.5	5.5	7.5		0.30		0.03 <sup>(3)</sup>	0.8	2.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005					active
C83460*		Rem <sup>(5)(2)</sup>		.09	2.5	4.5	4.0	6.0	.50	1.0	.05	.10		1.0 <sup>(4)</sup>		.005									.15	.6	.25		.005					active	
C83470* Copper Tin Zinc Alloy	90.0	96.0 <sup>(2)(5)</sup>		0.09	3.0	5.0	1.0	3.0		0.50		0.10 <sup>(6)</sup>		1.0 <sup>(4)</sup>		0.01									0.20	0.6		0.20		0.01				active	
C83500	86.0 <sup>(1)(2)</sup>	88.0	3.5	5.5	5.5	6.5	1.0	2.5		0.25		0.03 <sup>(3)</sup>	0.50 <sup>(4)</sup>	1.0		0.005										0.08		0.25		0.005				active	
C83520 Red Brass		Rem	3.5	4.5	3.5	4.5				0.30				1.0																				inactive 03/92	

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%				
C83600 Ounce Metal	84.0	86.0 <sup>(2)(1)</sup>	4.0	6.0	4.0	6.0	4.0	6.0		0.30		0.05 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005									active	
C83700 Red Brass	83.0	88.0		0.50		1.00		Rem		0.30		0.05		0.30		0.005	0.05	0.20											0.005										inactive 03/92	
C83800 Hydraulic Bronze	82.0 <sup>(1)(2)</sup>	83.8	5.0	7.0	3.3	4.2	5.0	8.0		0.30		0.03 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005									active	
C83810		Rem <sup>(1)(2)</sup>	4.0	6.0	2.0	3.5	7.5	9.5		0.50 <sup>(7)</sup>				2.0 <sup>(4)</sup>		0.005														0.10									active	
C84000* Semi-Red Brass	82.0	89.0 <sup>(1)</sup>		0.09	2.0	4.0	5.0	14.0		0.40		0.05	0.50	2.0		0.005									0.01	0.10	0.65		0.02								0.10 B 0.10 Zr	active		
C84010* Semi-Red Brass	82.0 <sup>(1)</sup>	89.0		0.09	2.0	4.0	5.0	14.0		0.40		0.05	0.50	2.0		0.005							0.01	0.20	0.10	0.65		0.02								0.10 B 0.10 Zr	active			
C84020* Semi-Red Brass	82.0 <sup>(1)</sup>	89.0		0.09	2.0	4.0	5.0	14.0		0.40		0.05	0.50	2.0											0.20	0.10	0.65		0.02							0.10 B 0.10 C 0.10 Ti 0.10 Zr	active			
C84030* Low Lead Semi-Red Brass	82.0 <sup>(1)</sup>	89.0		0.09	2.0	4.0	5.0	14.0		0.40		0.05	0.50	2.0											0.20	0.10	0.65	0.10	1.5						0.10 B 0.10 C 0.10 Ti 0.10 Zr	active				
C84100	78.0	85.0 <sup>(5)</sup>	0.05	0.25	1.5	4.5	12.0	20.0		0.30		0.05		0.50 <sup>(4)</sup>		0.01				0.09								0.05		0.01								active		
C84200	78.0 <sup>(1)(2)</sup>	82.0	2.0	3.0	4.0	6.0	10.0	16.0		0.40		0.05 <sup>(3)</sup>		0.8 <sup>(4)</sup>		0.005										0.08		0.25		0.005									active	
C84400 Valve Metal	78.0 <sup>(1)(2)</sup>	82.0	6.0	8.0	2.3	3.5	7.0	10.0		0.40		0.02 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005									active	
C84410		Rem <sup>(2)(1)</sup> <sub>(8)</sub>	7.0	9.0	3.0	4.5	7.0	11.0						1.0 <sup>(4)</sup>		0.01			0.05											0.2									active	
C84500	77.0 <sup>(2)(1)</sup>	79.0	6.0	7.5	2.0	4.0	10.0	14.0		0.40		0.02 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005										active
C84800 Plumbing Goods Brass	75.0	77.0 <sup>(2)(1)</sup>	5.5	7.0	2.0	3.0	13.0	17.0		0.40		0.02 <sup>(3)</sup>		1.0 <sup>(4)</sup>		0.005										0.08		0.25		0.005										active
C85200 Leaded Yellow Brass	70.0	74.0 <sup>(2)(9)</sup>	1.5	3.8	0.7	2.0	20.0	27.0		0.6		0.02		1.0		0.005										0.05		0.20		0.05										active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	
C85210	70.0	75.0 <sup>(10)(2)</sup>	2.0	5.0	1.0	3.0		Rem		0.8				1.0		0.005	0.02	0.06																	inactive 03/92
C85300 Yellow Brass	68.0	72.0 <sup>(9)</sup>		0.50		0.50		Rem				0.50																							inactive 08/77
C85310 Yellow Brass	68.0 <sup>(10)(2)</sup>	73.0	2.0	5.0		1.5		Rem		0.8				1.0		0.0	0.02	0.06																	inactive 03/92
C85400 No.1 Yellow Brass	65.0	70.0 <sup>(2)(10)</sup>	1.5	3.8	0.50	1.5	24.0	32.0		0.7				1.0 <sup>(4)</sup>		0.35																			active
C85430	66.0	72.0 <sup>(5)</sup>	0.01	0.25	0.6	1.7	27.0	31.0		0.30	0.01	0.15		0.30 <sup>(4)</sup>	0.50	1.2				0.10													0.02 B	active	
C85450* Copper Zinc Alloy	60.0 <sup>(5)</sup>	64.0		0.09	0.50	1.5		Rem	0.30	1.0				1.0 <sup>(4)</sup>		1.0																			active
C85470*	60.0	65.0 <sup>(5)</sup>		.09	1.0	4.0		Rem	.20	.02	.25				.10	1.0																			active
C85500	59.0 <sup>(2)(9)</sup>	63.0		0.20		0.20		Rem	0.20					0.20 <sup>(4)</sup>																					active
C85550* Low Silicon Brass	59.0	64.0 <sup>(5)</sup>		0.09		0.30		Rem	0.15					0.20 <sup>(11)</sup>		0.30											0.30	1.0							active
C85560	60.0	64.0 <sup>(12)(5)</sup>	.10	.25	.20	.50		Rem <sup>(13)</sup>	.15					.20			.05	.20 <sup>(14)</sup>	.60	.90															active
C85570	59.0 <sup>(5)(12)</sup>	65.0		0.25		0.50		Rem	0.30		0.20			0.20 <sup>(4)</sup>	0.10	0.50	0.02	0.16										0.05	0.50						active
C85600 Copper Zinc Alloy	59.0	63.0		0.20		0.20		Rem						0.20																					inactive 02/82
C85610 Yellow Brass	63.0	66.0	1.0	2.0	1.2	2.0		Rem	0.10	1.0				2.0																		1.0 Be		inactive 05/82	
C85660	62.0	64.0 <sup>(15)(12)</sup>		0.25		0.30		Rem	0.30					0.20 <sup>(4)</sup>	0.50	0.7	0.02	0.15																	active
C85700 Leaded Yellow Brass	58.0	64.0	0.8	1.5	0.50	1.5	32.0	40.0		0.7				1.0		0.8																			active
C85710 Yellow Brass	58.0	63.0	1.0	2.5		1.0		Rem	0.8					1.0	0.20	0.8																			inactive 03/92
C85800	57.0 <sup>(16)(2)</sup>			1.5		1.5	31.0	41.0		0.50		0.01		0.50 <sup>(4)</sup>		0.55		0.05																	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C85900* Yellow Brass	58.0	62.0 <sup>(1)</sup>		0.09		1.5	31.0	41.0		0.50		0.01		1.5	0.10	0.6								0.01	0.10	0.65		0.20		0.25						0.20 B 0.20 Zr	active
C85910* Yellow Brass	58.0 <sup>(1)</sup>	62.0		0.09		1.5	31.0	41.0		0.50		0.01		1.5	0.10	0.6								0.01	0.20	0.10	0.65		0.20		0.25					0.20 B 0.20 Zr	active
C85920* Yellow Brass	58.0	62.0 <sup>(1)</sup>		0.09		1.5	31.0	41.0		0.50				1.5	0.10	0.6									0.10	0.65		0.20		0.25					0.20 B 0.10 C 0.30 Ti 0.20 Zr	active	
C85930* Low-Lead Yellow Brass	58.0 <sup>(1)</sup>	62.0		0.09		1.5	31.0	41.0		0.50				1.5	0.10	0.6									0.10	0.65	0.10	1.5		0.25					0.20 B 0.10 C 0.30 Ti 0.20 Zr	active	
C86100 Manganese Bronze	66.0 <sup>(17)(2)</sup>	68.0		0.20		0.20		Rem	2.0	4.0					4.5	5.5								2.5	5.0												active
C86200	60.0 <sup>(17)(2)</sup>	66.0		0.20		0.20	22.0	28.0	2.0	4.0				1.0 <sup>(4)</sup>	3.0	4.9								2.5	5.0											active	
C86300 Manganese Bronze	60.0	66.0 <sup>(17)(2)</sup>		0.20		0.20	22.0	28.0	2.0	4.0				1.0 <sup>(4)</sup>	5.0	7.5								2.5	5.0												active
C86350* Manganese Bronze Alloy	60.0	64.0 <sup>(5)</sup>		0.09		0.8		Rem		1.0				0.50 <sup>(4)</sup>	0.30	1.1							0.10	2.0	5.0												active
C86400 Manganese Bronze	56.0	62.0 <sup>(17)(2)</sup>	0.50	1.5	0.50	1.5	34.0	42.0	0.40	2.0				1.0 <sup>(4)</sup>	0.50	1.5								0.10	1.5												active
C86500 Manganese Bronze	55.0 <sup>(2)(17)</sup>	60.0		0.40		1.0	36.0	42.0	0.40	2.0				1.0 <sup>(4)</sup>	0.50	1.5								0.10	1.5												active
C86550	57.0 <sup>(2)(17)</sup>			0.50		1.0		Rem	0.7	2.0				1.0 <sup>(4)</sup>	0.50	2.5								0.10	3.0				0.10								active
C86700	55.0	60.0 <sup>(2)(17)</sup>	0.50	1.5		1.5	30.0	38.0	1.0	3.0				1.0 <sup>(4)</sup>	1.0	3.0								0.10	3.5												active
C86800	53.5	57.0 <sup>(17)(2)</sup>		0.20		1.0		Rem	1.0	2.5			2.5	4.0 <sup>(4)</sup>		2.0								2.5	4.0												active
C87200 Silicon Bronze	89.0			0.50		1.0		5.0		2.5		0.50			1.5														1.0	5.0							inactive 09/82
C87300* Silicon Bronze	94.0 <sup>(5)</sup>			0.09			0.25		0.20														0.8	1.5					3.5	4.5							active
C87400	79.0 <sup>(18)</sup>			1.0			12.0	16.0							0.8														2.5	4.0							active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%		
C87410 Yellow Brass	79.0 <sup>(18)</sup>		1.0				12.0	16.0								0.8	0.03	0.06												2.5	4.0							inactive 03/92
C87420 Copper Silicon	79.0 <sup>(18)</sup>		1.0				12.0	16.0								0.8												0.03	0.06	2.5	4.0							inactive 03/92
C87430 Copper Silicon	79.0 <sup>(18)</sup>		1.0				12.0	16.0			0.03	0.06				0.8													2.5	4.0							inactive 03/92	
C87440	81.0 <sup>(5)</sup>		0.09		0.20		11.0	16.0		0.20		0.15		0.10															0.50	2.0							active	
C87500* Coppe Silicon Alloy	79.0 <sup>(5)</sup>		0.09				12.0	16.0								0.50													3.0	5.0							active	
C87510	79.0		0.50				12.0	16.0								0.50	0.03	0.06											3.0	5.0							inactive 03/92	
C87520 Copper Silicon	79.0		0.50				12.0	16.0								0.50												0.03	0.06	3.0	5.0						inactive 03/92	
C87530 Copper Silicon	79.0		0.50				12.0	16.0			0.03	0.06				0.50													3.0	5.0							inactive 03/92	
C87600* Copper Silicon Alloy	88.0 <sup>(5)</sup>		0.09				4.0	7.0		0.20																			3.5	5.5							active	
C87610* Cast Copper- Silicon	90.0 <sup>(5)</sup>		0.09				3.0	5.0		0.20																			3.0	5.0							active	
C87700* Silicon Bronze Silicon Bronze	87.5 <sup>(18)</sup>		0.09		2.0	7.0	9.0		0.50		0.15		0.25															0.10	2.5	3.5						active		
C87710* Silicon Bronze Silicon Bronze	84.0 <sup>(18)</sup>		0.09		2.0	9.0	11.0		0.50		0.15		0.25															0.10	3.0	5.0						active		

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	
C87800* Cast Silicon Bronze	80.0 <sup>(5)</sup>		0.09		0.25	12.0	16.0		0.15		0.01		0.20 <sup>(4)</sup>		0.15		0.05			0.01		0.15		0.05		0.05	3.8	4.2							active
C87845* Copper- Silicon- Brass	75.0	78.0 <sup>(5)</sup>	0.02		0.10		Rem		0.10	0.03	0.06		0.20 <sup>(4)</sup>		0.09		0.015						0.10			0.015	2.5	2.9				0.015 Cr		active	
C87850* Copper Silicon Alloy	74.0 <sup>(5)</sup>	78.0	0.09		0.30		Rem		0.10	0.05	0.20		0.20 <sup>(4)</sup>										0.10			0.10	2.7	3.4						active	
C87860*	75.0 <sup>(5)</sup>	79.0	.09		.30		Rem		.10	.05	.20		.20 <sup>(4)</sup>										.10				2.7	3.5			.002 Zr	.030 Zr		active	
C87870*	75.0	79.0 <sup>(5)</sup>	.09	.30	.7	16.0	23.0		.10	.05	.20		.20 <sup>(4)</sup>										.10				2.7	3.5				.030 Zr		active	
C87900 Copper Silicon	63.0		0.25		0.25	30.0	36.0		0.40		0.01		0.50		0.15		0.05						0.15		0.05	0.05	0.8	1.2						active	
C89320*	87.0 <sup>(5)</sup>	91.0	0.09	5.0	7.0		1.0		0.20		0.30		1.0 <sup>(4)</sup>		0.005			4.0	6.0					0.08	0.35	0.005								active	
C89325	84.0	88.0 <sup>(17)(19)</sup>	0.10	9.0	11.0		1.0		0.15		0.10		1.0 <sup>(4)</sup>		0.005			2.7	3.7					0.08	0.50	0.005								active	
C89510* SeBiLOY I (EnviroBrass I)	86.0 <sup>(5)</sup>	88.0	0.09	4.0	6.0	4.0	6.0		0.20		0.05		1.0 <sup>(4)</sup>		0.005			0.50	1.5 <sup>(20)</sup>					0.08	0.25	0.005	0.35 <sup>(20)</sup>	0.75						active	
C89520* SeBiLOY II (EnviroBrass II)	85.0	87.0 <sup>(5)</sup>	0.09	5.0	6.0	4.0	6.0		0.20				1.0 <sup>(4)</sup>		0.005			1.6 <sup>(21)</sup>	2.2					0.08	0.25		0.8	1.1 <sup>(21)</sup>						active	
C89530 Copper- Bismuth- Selenium Alloy Brasses	84.0 <sup>(5)</sup>	89.0	0.20	3.5	6.0	7.0	9.0		0.30		0.05		1.0 <sup>(4)</sup>		0.01			1.0	2.0						0.20		0.01	0.10	0.30						active
C89535 Copper- Bismuth Alloy	84.0	89.0 <sup>(5)</sup>	0.25	2.5	5.5	5.0	9.0		0.30		0.40	0.30 <sup>(4)</sup>	1.0		0.01			0.8	2.0						0.20		0.01		0.50						active
C89537*	84.0 <sup>(5)</sup>	86.0	.09	3.0	6.0	5.0	13.0		.50									.50	3.0	.01	.10					.6	1.2			.0005 B	.0020 B		active		
C89540	58.0	64.0 <sup>(5)</sup>	0.10		1.2	32.0	38.0		0.50				1.0 <sup>(4)</sup>	0.10	0.60			0.6	1.2											0.10				active	
C89545	66.0	72.0 <sup>(5)</sup>	0.09		0.50	27.0	31.0		0.30	0.01	0.15		1.0 <sup>(4)</sup>	0.6	1.5			0.20	0.9				0.30					0.30				0.02 B		active	

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	
C89550* SeBiLOY III (EnviroBrass III)	58.0 <sup>(5)</sup>	64.0	0.09	0.00	1.2	32.0	38.0	0.50	0.01	1.0 <sup>(4)</sup>	0.10	0.6	0.6	1.2					0.05	0.05	0.25	0.01	0.10											active	
C89560* Copper-Zinc-Bismuth	58.0 <sup>(5)</sup>	61.0	0.09	0.25		Rem		0.12					0.30	0.8				1.0	2.4													0.0003 B	0.0015 B 0.001 Cd	active	
C89570*	58.0 <sup>(5)</sup>	63.0	.09	.20	1.5	35.0	38.0	.50	.05	.15	.15	.50 <sup>(4)</sup>	.10	1.0				.05	1.5												.0001 B	.0020 B	active		
C89580*	57.0 <sup>(5)</sup>	64.0	.09	.50		Rem		.10				.30 <sup>(4)</sup>	.10	1.2				.10	1.0														active		
C89710 Green Brass	61.5 <sup>(15)</sup>	62.5	0.10	0.50	0.6		Rem		0.15	0.20			0.15	0.25				0.15	0.30			0.20	0.40		0.25	0.35					0.002 B	0.005 B	active		
C89720* Copper-Bismuth Alloy TECO	63.0 <sup>(5)</sup>		0.09	0.6	1.5	26.0	32.0	0.10	0.02	0.10 <sup>(4)</sup>	0.35	1.5	0.50	2.0							0.10		0.02	0.20	0.40	1.0					0.0005 B	0.01 B	active		
C89831	87.0 <sup>(17)</sup> (19)	91.0	0.10	2.7	3.7	2.0	4.0	0.30	0.050	1.0 <sup>(4)</sup>		0.005	2.7	3.7							0.08	0.25	0.005										active		
C89833* Copper Bismuth Alloy	86.0	91.0 <sup>(1)</sup>	0.09	4.0	6.0	2.0	6.0	0.30	0.050	1.0 <sup>(4)</sup>		0.005	1.7	2.7							0.08	0.25	0.005										active		
C89835* Federalloy III-932	85.0	89.0 <sup>(17)(19)</sup>	0.09	6.0	7.5	2.0	4.0	0.20	0.10	1.0 <sup>(4)</sup>		0.005	1.7	2.7							0.08	0.35	0.005										active		
C89836 Copper Bismuth Alloy	87.0	91.0 <sup>(5)</sup>	0.25	4.0	7.0	2.0	4.0	0.35	0.06	0.90 <sup>(4)</sup>		0.005	1.5	3.5							0.08	0.25	0.005										active		
C89837	84.0	88.0 <sup>(19)(17)</sup>	0.10	3.0	4.0	6.0	10.0	0.30	0.050	1.0 <sup>(4)</sup>		0.005	0.7	1.2							0.08	0.25	0.005										active		
C89838	78.0	85.0 <sup>(5)</sup>	0.09	1.5	4.0	12.0	18.0	0.30	0.05	0.50 <sup>(4)</sup>		0.01	0.20	0.9								0.05	0.01										active		
C89839	80.0 <sup>(5)</sup>	82.0	0.20	0.8	1.5	15.5	18.5	0.30	0.03	0.20 <sup>(4)</sup>		0.005	0.40	1.0								0.20	0.005										active		
C89841 Copper-Bismuth Alloy	73.0	77.0 <sup>(5)</sup>		0.30	18.0	23.0		0.10		0.20 <sup>(11)</sup>		0.01	0.50	1.0							0.10		0.10	2.8	3.4								active		

UNS #	Cu		Pb		Sn		Zn		Fe		P		Ni		Al		As		Bi		Mg		Mn		S		Sb		Si		Se		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%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%		
C89842* Copper-Zinc-Tin-Bismuth	78.0	82.0 <sup>(5)</sup>		0.09	2.0	3.0		Rem		0.30	0.005	0.02	0.10 <sup>(4)</sup>	0.50		0.005			1.5	2.5								0.05	0.005									active
C89844	83.0	86.0 <sup>(1)</sup>		0.20	3.0	5.0	7.0	10.0		0.30		0.05	1.0 <sup>(4)</sup>		0.005			2.0	4.0						0.08	0.25	0.005											active
C89845* Copper-Bismuth-Alloy	82.5	87.5 <sup>(5)</sup>		0.09	3.0	5.0	6.0	9.0		0.30		0.05	1.5	2.5 <sup>(4)</sup>		0.01		1.0	2.0								0.25	0.01									active	
C89940*	64.0	68.0 <sup>(5)</sup>		0.01	3.0	5.0	3.0	5.0	0.7	2.0	0.10	0.15	20.0 <sup>(4)</sup>	23.0		0.005		4.0	5.5				0.20	0.05	0.10	0.15											active	



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

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

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

(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) = For continuous castings, P shall be 1.0% max.

(7) = Fe + Sb + As shall be 0.50% max.

(8) = Fe + Sb + As shall be .8% max.

(9) = Cu + Sum of Named Elements 99.1% min.

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

(11) = Includes Co.

(12) = Cu value includes Ag.

(13) = For optimum DZR properties , Zn should not exceed 38%.

(14) = P may be substituted for As.

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

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

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

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

(19) = 0.01 - 2.0% as any single or combination of Ce La or other rare earth(x) elements as agreed upon. (x)ASM International definition: one of the group of chemically similar metals with atomic numbers 57 through 71 commonly referred to as lanthanides

(20) = Experience favors Bi:Se >= 2:1

(21) = Bi:Se >= 2:1