



Application Datasheet

Standard Designation for Wrought Copper Alloys

- C20000-C29999: Copper-Zinc Alloys (*Yellow Brasses*)
- C30000-C39999: Copper-Zinc-Lead Alloys (*Leaded Brasses*)
- C40000-C49999: Copper-Zinc-Tin Alloys (*Tin Brasses*)

Revision Date: November 20, 2025

Brasses (C20000 - C49999)

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

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C20500* Brass	97.0	98.0		0.02				Rem		0.05					inactive 03/92
C21000* Gilding, 95%	94.0	96.0 ⁽¹⁾		0.05				Rem		0.05					active
C22000* Commercial Bronze, 90%	89.0	91.0 ⁽¹⁾		0.05				Rem		0.05					active
C22600* Jewelry Bronze, 87-1/2%	86.0	89.0 ⁽¹⁾		0.05				Rem		0.05					active
C23000* Red Brass, 85%	84.0	86.0 ⁽¹⁾		0.05				Rem		0.05					active
C23030*	83.5 ⁽¹⁾	85.5		0.05				Rem		0.05			0.20 Si	0.40 Si	active
C23400*	81.0	84.0 ⁽¹⁾		0.05				Rem		0.05					active
C24000* Low Brass, 80%	78.5 ⁽¹⁾	81.5		0.05				Rem		0.05					active
C24080	78.0 ⁽¹⁾	82.0		0.20				Rem						0.10 Al	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C25000* Brass	74.0	76.0		0.05				Rem		0.05					inactive 03/92
C25600*	71.0	73.0 ⁽²⁾		0.05				Rem		0.05					active
C26000* Cartridge Brass, 70%	68.5 ⁽²⁾	71.5		0.07				Rem		0.05					active
C26100* Brass	68.5	71.5 ⁽²⁾		0.05				Rem		0.05	0.02	0.05	0.02 As	0.06 As	inactive 03/92
C26130*	68.5	71.5 ⁽²⁾		0.05				Rem		0.05			0.02 As	0.08 As	active
C26200*	67.0	70.0 ⁽²⁾		0.07				Rem		0.05					active
C26380 Brass	68.0	72.0		0.30				Rem		0.05				0.10 Ag	inactive 03/92
C26800* Yellow Brass, 66%	64.0	68.5 ⁽²⁾		0.09				Rem		0.05					active
C27000* Yellow Brass, 65%	63.0	68.5 ⁽²⁾		0.09				Rem		0.07					active
C27200* Yellow Brass	62.0	65.0 ⁽²⁾		0.07				Rem		0.07					active
C27250	62.0	65.0 ⁽³⁾		0.009				Rem		0.35	0.05	0.40	0.20 C	0.009 Bi 1.2 C 0.009 Si	active
C27400* Yellow Brass, 63%	61.0	64.0 ⁽²⁾		0.09				Rem		0.05					active
C27450 Yellow Brass	60.0 ⁽³⁾	65.0		0.25				Rem		0.35					active
C27451 Yellow Brass Yellow Brass	61.0	65.0 ⁽³⁾		0.25				Rem		0.35	0.05	0.20			active
C27453 Copper Zinc Alloy	61.5 ⁽³⁾	63.5		0.25		0.15		Rem		0.15			0.02 As	0.15 As	active
C27460	60.0 ⁽³⁾	62.0		0.25	0.15	0.35		Rem		0.10	0.15	0.25	0.20 Ni 0.080 Al 0.060 Si	0.35 Ni 0.16 Al 0.090 Si	active
C27550	60.0	63.0 ⁽³⁾		0.04				Rem		0.35		0.40	0.20 C	0.009 Bi 1.2 C 0.009 Si	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C28000* Muntz Metal, 60%	59.0	63.0 ⁽²⁾		0.09				Rem		0.07					active
C28200 Copper Zinc Alloy	58.0	61.0		0.03				Rem		0.05	0.12	0.22		0.005 Al 0.05 Si	inactive 02/73
C28300* Yellow Brass	58.0 ⁽⁴⁾	62.0		0.09			31.0	41.0		0.35			0.10 S	0.20 B 0.01 Mn 0.65 S 0.20 Zr	active
C28310* Yellow Brass	58.0 ⁽⁴⁾	62.0		0.09			31.0	41.0		0.35			0.01 Mn 0.10 S	0.20 B 0.20 Mn 0.65 S 0.20 Zr	active
C28320* Yellow Brass	58.0	62.0 ⁽⁴⁾		0.09			31.0	41.0		0.35			0.10 S	0.20 B 0.10 C 0.20 Mn 0.65 S 0.30 Ti 0.20 Zr	active
C28330* Low-Lead Yellow Brass	58.0	62.0 ⁽⁴⁾		0.09			31.0	39.0		0.35			0.10 Sb	0.10 B 0.10 C 0.20 Mn 0.25 S 1.5 Sb 0.10 Ti 0.10 Zr	active
C28340	61.0 ⁽³⁾	62.0	.17	.25	.30	.40		Rem ⁽⁵⁾		.12			.07 As .65 Bi	.20 Ni .17 As ⁽⁶⁾ .75 Bi .04 Cd .02 Cr .05 Mn .05 Sb .05 Si	active
C28500 Copper-Zinc- Alloy Brass	57.0	59.0 ⁽⁷⁾		0.25				Rem		0.35					active
C28550	57.0	60.0 ⁽³⁾		0.04				Rem		0.35		0.40	0.20 C	0.009 Bi 1.2 C 0.009 Si	active
C28580 Brass	49.0	52.0		0.50				Rem		0.10				0.10 Al	inactive 03/92
C29800 Copper Zinc Alloy	49.0	52.0		0.50				Rem		0.10				0.10 Al	inactive 07/74
C31000 Copper Zinc Lead Alloy	89.0	91.0	0.30	0.7				Rem		0.10					inactive 07/74
C31200	87.5	90.5 ⁽⁸⁾	0.7	1.2				Rem		0.10				0.25 Ni	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C31400 Leaded Commercial Bronze	87.5	90.5 ⁽⁸⁾	1.3	2.5				Rem		0.10				0.7 Ni	active
C31600 Leaded Commercial Bronze (Nickel-Bearing)	87.5	90.5 ⁽⁸⁾	1.3	2.5				Rem		0.10	0.04	0.10	0.7 Ni	1.2 Ni	active
C32000 Leaded Red Brass	83.5 ⁽⁸⁾	86.5	1.5	2.2				Rem		0.10				0.25 Ni	active
C32500 Copper Zinc Lead Alloy	72.0	74.5	2.5	3.0				Rem		0.10					inactive 07/74
C32510 Leaded Brass	69.0	72.0	0.30	0.7				Rem					0.02 As	0.06 As	active
C33000 Low Leaded Brass (Tube)	65.0	68.0 ⁽⁸⁾	0.25	0.7				Rem		0.07					active
C33100 Leaded Brass	65.0	68.0	0.8	1.5				Rem		0.06					inactive 03/92
C33200 High Leaded Brass (Tube)	65.0	68.0 ⁽⁸⁾	1.5	2.5				Rem		0.07					active
C33500 Low-Leaded Brass	62.0 ⁽⁸⁾	65.0	0.25	0.7				Rem		0.15 ⁽⁹⁾					active
C33530 Leaded Brass	62.5	66.5	0.30	0.8				Rem		0.10			0.02 As	0.06 As	inactive 03/92
C34000 Medium Leaded Brass, 64-1/2%	62.0 ⁽⁸⁾	65.0	0.8	1.5				Rem		0.15 ⁽⁹⁾					active
C34200 High Leaded Brass, 64-1/2%	62.0 ⁽⁸⁾	65.0	1.5	2.5				Rem		0.15 ⁽⁹⁾					active
C34400 Leaded Brass	62.0	66.0	0.50	1.0				Rem		0.10					inactive 02/81
C34500	62.0 ⁽⁸⁾	65.0	1.5	2.5				Rem		0.15					active
C34700 Leaded Brass	62.5	64.5	1.0	1.8				Rem		0.10					inactive 02/81
C34800 Leaded Brass	61.5	63.5	0.40	0.8				Rem		0.10					inactive 02/81

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C34900 Leaded Brass	61.0	64.0	0.10	0.50				Rem		0.10					inactive 02/82
C35000 Medium Leaded Brass, 62%	60.0 ⁽⁸⁾⁽¹⁰⁾	63.0	0.8	2.0				Rem		0.15 ⁽⁹⁾					active
C35300 High Leaded Brass, 62%	60.0 ⁽³⁾⁽¹⁰⁾	63.0	1.5	2.5				Rem		0.15 ⁽⁹⁾					active
C35330 DZR Brass	59.5	64.0 ⁽³⁾	1.5	3.5 ⁽¹¹⁾				Rem					0.02 As	0.25 As	active
C35340 Leaded Brass	60.0	63.0	1.5	2.5				Rem	0.10	0.30					inactive 03/92
C35350 Leaded Brass	61.0 ⁽³⁾	63.0	2.0	4.5		0.6		Rem		0.4	0.05	0.2		0.3 Ni	active
C35600 Extra High Leaded Brass	60.0 ⁽³⁾	63.0	2.0	3.0				Rem		0.15 ⁽⁹⁾					active
C36000 Free-Cutting Brass	60.0	63.0 ⁽³⁾	2.5	3.0				Rem		0.35					active
C36010 Leaded Brass Free-Cutting Brass	60.0	63.0 ⁽³⁾	3.1	3.7				Rem		0.35					active
C36200 Leaded Brass	60.0	63.0	3.5	4.5				Rem		0.15					inactive 03/92
C36300 Copper-Zinc-Lead Alloy	61.0	63.0 ⁽³⁾	0.25	0.7				Rem		0.15	0.04	0.15			active
C36500 Leaded Muntz Metal, Uninhibited	58.0 ⁽⁸⁾	61.0	0.25	0.7		0.25		Rem		0.15					active
C36600 Leaded Muntz Metal, Arsinical	58.0	61.0	0.25	0.7		0.25		Rem		0.15			0.02 As	0.06 As	inactive 03/92
C36700 Leaded Muntz Metal, Antimonial	58.0	61.0	0.25	0.7		0.25		Rem		0.15			0.02 Sb	0.10 Sb	inactive 03/92
C36800 Leaded Brass	58.0	61.0	0.25	0.7		0.25		Rem		0.15	0.02	0.10			inactive 03/92
C37000 Free-Cutting Muntz Metal	59.0	62.0 ⁽⁸⁾	0.8	1.5				Rem		0.15					active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C37100	58.0	62.0 ⁽⁸⁾	0.6	1.2				Rem		0.15					active
C37700 Forging Brass	58.0 ⁽³⁾	61.0	1.5	2.5				Rem		0.30					active
C37710	56.5 ⁽³⁾	60.0	1.0	3.0				Rem		0.30					active
C37800 Leaded Brass	56.0	59.0	1.5	2.5				Rem		0.30					inactive 03/92
C38000 Architectural Bronze, Low Leaded	55.0	60.0 ⁽³⁾	1.5	2.5		0.30		Rem		0.35				0.50 Al	active
C38010 Leaded Brass	55.0	60.0	1.5	3.0				Rem		0.30			0.10 Al	0.6 Al	inactive 03/92
C38500 Architectural Bronze	55.0 ⁽³⁾	59.0	2.5	3.5				Rem		0.35					active
C38510 Leaded Brass	56.0	60.0	2.5	4.5				Rem							inactive 03/92
C38590 Leaded Brass	56.5	60.0	2.0	3.5				Rem		0.35					inactive 03/92
C38600 Leaded Brass	56.0	59.0	2.5	3.5				Rem		0.35				0.02 Sb	inactive 02/82
C40400*		Rem ⁽²⁾			0.35	0.7	2.0	3.0							active
C40410* Copper-Zinc-Tin Alloy	95.0	99.0 ⁽²⁾		0.05	0.1	0.40		Rem		0.05					active
C40500* Penny Bronze	94.0 ⁽²⁾	96.0		0.05	0.7	1.3		Rem		0.05					active
C40800* Silicon Brass	94.0	96.0		0.05	1.8	2.2		Rem		0.05					inactive 03/92
C40810*	94.5 ⁽²⁾	96.5		0.05	1.8	2.2		Rem	0.08	0.12	0.028	0.04	0.11 Ni	0.20 Ni	active
C40820*	94.0 ⁽³⁾			0.02	1.0	2.5	0.20	2.5				0.05	0.10 Ni	0.50 Ni	active
C40850*	94.5 ⁽²⁾	96.5		0.05	2.6	4.0		Rem	0.05	0.20	0.01	0.20	0.05 Ni	0.20 Ni	active
C40860*	94.0 ⁽²⁾	96.0		0.05	1.7	2.3		Rem	0.01	0.05	0.02	0.04	0.05 Ni	0.20 Ni	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C40900 Copper Zinc Tin Alloy	92.0	94.0		0.05	0.50	0.8		Rem		0.05					inactive 07/74
C40950*	91.5 ⁽²⁾	94.5		.05	.30	.8		Rem		.03	.01	.08	.30 Ni ⁽¹²⁾	.8 Ni	active
C41000*	91.0 ⁽²⁾	93.0		0.05	2.0	2.8		Rem		0.05					active
C41100* Tin Brass	89.0	92.0 ⁽²⁾		0.09	0.30	0.7		Rem		0.05					active
C41110* Copper Zinc Tin Alloy	90.0	94.0 ⁽²⁾		0.05	0.10	0.50		Rem		0.05					active
C41120*	89.0	92.0 ⁽²⁾		0.05	0.30	0.7		Rem	0.05	0.20	0.01	0.35	0.05 Ni	0.20 Ni	active
C41125*	86.5 ⁽³⁾	90.5		.05	.50	.9		Rem		.03		.06		.8 Ni	active
C41300* Tin Brass	89.0 ⁽²⁾	93.0		0.09	0.7	1.3		Rem		0.05					active
C41500* Tin Brass	89.0	93.0 ⁽²⁾		0.09	1.5	2.2		Rem		0.05					active
C41900 Tin Brass	89.0	92.0		0.10	4.5	5.5		Rem		0.05					inactive 07/74
C42000*	88.0 ⁽²⁾	91.0			1.5	2.0		Rem				0.25			active
C42100* Tin Brass	87.5	89.0		0.05	2.2	3.0		Rem		0.05		0.35	0.15 Mn	0.35 Mn	inactive 03/92
C42200*	86.0 ⁽²⁾	89.0		0.05	0.8	1.4		Rem		0.05		0.35			active
C42210* Tin Brass	86.0	89.0 ⁽²⁾⁽¹³⁾		0.01	1.1	1.6		Rem		0.035	0.001	0.010		0.5 Ni ⁽¹⁴⁾ 0.005 Te ⁽¹⁵⁾ 0.005 Se ⁽¹⁵⁾	active
C42220*	88.0 ⁽²⁾	91.0		0.05	0.7	1.4		Rem	0.05	0.20	0.02	0.05	0.05 Ni	0.20 Ni	active
C42230 BW33520	87.0 ⁽³⁾	91.0		0.01	0.40	1.5		Rem		0.05			0.30 Co 0.05 Si	1.5 Co 0.05 Mn 0.30 Si	active
C42300	87.0 ⁽³⁾	91.0		0.01	0.50	1.5		Rem					0.50 Ni 0.10 Si	1.5 Ni 0.30 Si	active
C42400	87.0 ⁽¹⁶⁾	91.0			0.05	0.50		Rem					0.10 Cr 0.50 Ni 0.05 Zr 0.10 Si	0.50 Cr 1.5 Ni 0.20 Zr 0.30 Si	active
C42500*	87.0	90.0 ⁽²⁾		0.05	1.5	3.0		Rem		0.05		0.35			active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C42510															inactive 12/98
C42520*	88.0 ⁽²⁾	91.0		0.05	1.5	3.0		Rem	0.05	0.20	0.01	0.20	0.05 Ni	0.20 Ni	active
C42600*	87.0	90.0 ⁽¹³⁾⁽²⁾		0.05	2.5	4.0		Rem	0.05	0.20	0.01	0.20	0.05 Ni	0.20 Ni ⁽¹²⁾	active
C43000* Tin Brass	84.0	87.0 ⁽²⁾		0.09	1.7	2.7		Rem		0.05					active
C43200 Tin Brass	85.0	88.0		0.35	0.40	0.6		Rem		0.05		0.35			inactive 03/92
C43400*	84.0	87.0 ⁽²⁾		0.05	0.40	1.0		Rem		0.05					active
C43500* Tin Brass	79.0	83.0 ⁽²⁾		0.09	0.6	1.2		Rem		0.05					active
C43600*	80.0 ⁽²⁾	83.0		0.05	0.20	0.50		Rem		0.05					active
C43800* Copper Zinc Tin Alloy	79.0	82.0		0.05	1.0	1.5		Rem		0.05					inactive 07/74
C44200* Copper Zinc Tin Alloy	70.0	73.0		0.07	0.8	1.2		Rem		0.06					inactive 05/71
C44250*	73.0 ⁽⁸⁾	76.0		0.07	0.50	1.5		Rem		0.20		0.10		0.20 Ni	active
C44300* Admiralty, Arsenical	70.0	73.0 ⁽⁸⁾		0.07	0.8	1.2 ⁽¹⁷⁾		Rem		0.06			0.02 As	0.06 As	active
C44400* Admiralty, Antimonial	70.0	73.0 ⁽⁸⁾		0.07	0.8 ⁽¹⁷⁾	1.2		Rem		0.06			0.02 Sb	0.10 Sb	active
C44500* Admiralty, Phosphorized	70.0 ⁽⁸⁾	73.0		0.07	0.8	1.2 ⁽¹⁷⁾		Rem		0.06	0.02	0.10			active
C44710	65.5 ⁽²⁾	71.5		0.05	0.20	0.8		Rem		0.03	0.005	0.05	1.5 Ni	2.5 Ni	active
C44730		Rem ⁽³⁾		.05	.50	1.5	27.0	31.0		.6		.05	.8 Ni ⁽¹²⁾ .10 Si	2.5 Ni .7 Cr .40 Mg .40 Mn .6 Si .40 Zr	active
C44750* Tin Brass		Rem ⁽⁸⁾		0.05	0.30	3.0	27.0	31.5	0.10	1.5					active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C45450* Tin Brass	65.0	66.0			0.10	0.30		Rem			0.10	0.30	0.20 Al	0.40 Al	inactive 03/92
C45470* Copper-Zinc-Tin Aluminum Alloy	64.0	69.0 ⁽³⁾		.09	0.6	0.9		Rem					0.30 Al	0.8 Al	active
C46200 Naval Brass, 63-1/2%	62.0	65.0 ⁽⁸⁾		0.20	0.50	1.0		Rem		0.10					active
C46210* Tin Brass	61.0	64.0		0.05		1.0		Rem						0.03 Al 0.50 Si	inactive 03/92
C46250* HONLUX 01	62.0	65.0 ⁽¹⁸⁾⁽³⁾		.09	.50	1.0		37.0		.10	.05	.15	.05 Mg	.20 Mg	active
C46270	62.0 ⁽¹⁹⁾	65.0		0.10	0.8	1.5		Rem		0.10		0.20	0.6 Si	0.10 Ni 0.10 Mn 1.2 Si	active
C46400 Naval Brass, Uninhibited	59.0 ⁽⁸⁾	62.0		0.20	0.50	1.0		Rem		0.10					active
C46420 Tin Brass	61.0	63.5		0.20	1.0	1.4		Rem		0.20					inactive 03/92
C46500 Naval Brass, Arsenical	59.0 ⁽⁸⁾	62.0		0.20	0.50	1.0		Rem		0.10			0.02 As	0.06 As	active
C46600 Tin Brass	59.0	62.0		0.20	0.50	1.0		Rem		0.10			0.02 Sb	0.10 Sb	inactive 03/92
C46700 Tin Brass	59.0	62.0		0.20	0.50	1.0		Rem		0.10	0.02	0.10			inactive 03/92
C46750	59.2 ⁽³⁾	62.5		.25	1.00	1.80		Rem		.10	.05	.15	.05 Sb	.50 Ni ⁽¹²⁾ .15 Sb	active
C47000 Naval Brass Welding and Brazing Rod	57.0 ⁽⁸⁾	61.0		0.05	0.25	1.0		Rem						0.01 Al	active
C47200 Copper Zinc Tin Alloy	49.0	52.0		0.50	3.0	4.0		Rem		0.10					inactive 07/74
C47600 Tin Brass	86.0	88.0	1.8	2.2	1.8	2.2		Rem		0.05	0.03	0.07	0.05 Mn	0.15 Mn	inactive 03/92
C47940	63.0 ⁽⁸⁾	66.0	1.0	2.0	1.2	2.0		Rem	0.10	1.0			0.10 Ni ⁽¹²⁾	0.50 Ni	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C48200 Naval Brass, Medium Leaded	59.0 ⁽⁸⁾	62.0	0.40	1.0	0.50	1.0		Rem		0.10					active
C48500 Naval Brass, High Leaded	59.0 ⁽⁸⁾	62.0	1.3	2.2	0.50	1.0		Rem		0.10					active
C48510 Tin Brass	59.0	62.0	1.0	2.5	0.7	1.5		Rem					0.02 As	0.25 As	inactive 02/81
C48600 DZR Brass	59.0	62.0 ⁽⁸⁾	1.0	2.5	0.30	1.5		Rem					0.02 As	0.25 As	active
C48640	59.0	62.0 ⁽³⁾	1.0	3.0	0.50	2.0		Rem		0.40	0.05	0.25		0.3 Ni	active
C48645	60.0 ⁽³⁾	63.0	1.0	2.5	0.10	1.5		Rem		0.30	0.02	0.25	0.10 Ni	1.0 Ni	active
C48650 Replaced by C48600															inactive 02/81
C49080 Tin Brass	49.0	52.0		0.50	3.0	4.0		Rem						0.10 Al	inactive 03/92
C49100	85.5 ⁽³⁾	87.5		.09		.30		14.5		.30		.10	.30 Te	.30 Ni .9 Te	active
C49250* Copper-Zinc-Bismuth Copper-Zinc-Bismuth	58.0	61.0 ⁽³⁾		0.09		0.30		Rem		0.50			1.8 Bi	2.4 Bi 0.001 Cd	active
C49255 Copper-Zinc-Bismuth	58.0 ⁽³⁾	60.0		0.09		0.50		Rem		0.10		0.10	1.7 Bi 0.02 Se	0.3 Ni 2.9 Bi 0.0075 Cd 0.10 Si 0.07 Se	active
C49260* GEM Brass	58.0	63.0 ⁽³⁾		0.09		0.50		Rem		0.50	0.05	0.15	0.50 Bi	1.8 Bi 0.001 Cd 0.10 Si	active
C49265 Low Leaded GEM Brass	58.0 ⁽¹³⁾⁽³⁾	62.0	0.09	0.25		0.50		Rem		0.30	0.05	0.12	0.50 Bi	1.3 Bi 0.001 Cd 0.10 Si	active
C49300* Lead-Free Bismuth Alloy Lead-Free	58.0 ⁽³⁾	62.0		0.09	1.0	1.8		Rem		0.10			0.5 Bi	0.3 Ni 2.5 Bi 0.0075 Cd 0.50 Sb 0.10 Si 0.20 Se	active
C49340* GEM Brass	60.0	63.0 ⁽³⁾⁽¹³⁾		0.09	0.50	1.5		Rem		0.12	0.05	0.15	0.50 Bi	2.2 Bi 0.001 Cd 0.10 Si	active

UNS #	Cu		Pb		Sn		Zn		Fe		P		Other Named Elements		Status
	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	Min%	Max%	
C49345 Low Leaded GEM Brass	60.0	64.0 ⁽³⁾⁽¹³⁾	0.09	0.25	0.50	1.5		Rem		0.30	0.05	0.12	0.50 Bi	1.3 Bi 0.001 Cd 0.10 Si	active
C49350* Bismuth Brass Alloy	61.0 ⁽³⁾	63.0		0.09	1.5	3.0		Rem		0.12	0.04	0.15	0.50 Bi 0.02 Sb	2.5 Bi 0.10 Sb 0.30 Si	active
C49355* Copper Zinc Bismuth Alloy	63.0 ⁽³⁾	69.0		0.09	0.50	2.0	27.0	35.0		0.10			0.50 Bi 1.0 Si	0.001 B 1.5 Bi 0.10 Mn 2.0 Si	active
C49360* Tin-Eco(bismuth)		Rem ⁽³⁾		0.09	1.0	2.0	19.0	22.0					0.50 Bi 2.0 Si	1.5 Bi 3.5 Si	active
C49400	57.0 ⁽³⁾	60.0		0.10		0.30		Rem		0.30		0.02	0.10 Mg	0.20 Ni 0.02 Mn 0.02 Si 0.50 Mg 0.10 Al	active
C49450	61.0	64.0		0.10		0.30		Rem		0.30		0.02	0.10 Mg	0.10 Mn 0.02 Si 0.50 Mg 0.10 Al 0.20 Ni	active
C49500	62.0	65.0		0.10		0.30		Rem		0.30	0.02	0.30	0.10 Mg 0.02 As	0.10 Ni 0.10 Mn 0.02 Si 0.50 Mg 0.15 As 0.10 Al	active

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

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

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

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

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

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

(6) = P may be substituted for As.

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

(8) = Cu + Sum of Named Elements 99.6% min.

(9) = For flat products, the iron shall be 0.10% max.

(10) = Cu, 61.0% min. for rod.

(11) = Pb may be reduced to 1.0% by agreement.

(12) = Ni value includes Co.

(13) = Cu value includes Ag.

(14) = Includes Co.

(15) = Te + Se 0.006% max.

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

(17) = For tubular products, the minimum Sn content may be 0.9%.

(18) = Includes Lanthanum 0.01-0.08

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