



Leaded Red Brass and Semi-Red Brass (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Leaded Red and Semi-Red Brasses	C83300	92.0-94.0	1.0-2.0	1.0-2.0	2.0-6.0	–	–	–	–	–	–	–	–	–	–
	C83450	87.0-89.0 ^{B,C}	2.2-3.5	1.5-2.5	5.8-7.5	0.25	0.25	0.8-1.5	0.08	0.03	0.005	–	0.005	–	–
	C83600	84.0-86.0 ^{B,C}	4.3-6.0	4.0-5.7	4.3-6.0	0.25	0.25	0.8	0.08	0.03	0.005	–	0.005	–	–
	C83800	82.0-83.5 ^{B,C}	3.5-4.2	5.8-6.8	5.5-8.0	0.25	0.25	0.8	0.08	0.02	0.005	–	0.005	–	–
	C84200	78.0-82.0 ^{B,C}	4.3-6.0	2.0-2.8	10.0-16.0	0.35	0.25	0.8	0.08	0.02	0.005	–	0.005	–	–
	C84400	79.0-82.0 ^{B,C}	2.5-3.5	6.3-7.7	7.0-10.0	0.35	0.25	0.8	0.08	0.02	0.005	–	0.005	–	–
	C84500	77.0-79.0	2.0-4.0	6.0-7.5	10.0-14.0	0.40	0.25	1.0	0.08	0.02	0.005	–	0.005	–	–
	C84800	75.0-76.7 ^{B,C}	2.3-3.0	5.5-6.7	13.0-16.0	0.35	0.25	0.8	0.08	0.02	0.005	–	0.005	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^C Cu + sum of named elements, 99.3%.



Yellow Brass (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Yellow Brass	C85200	70.0-73.0 ^{B,D}	0.8-1.7	1.5-3.5	21.0-27.0	0.50	0.20	0.8	0.05	0.01	0.005	–	0.05	–	–
	C85400	66.0-69.0 ^{B,E}	0.50-1.5	1.5-3.5	25.0-31.0	0.50	–	0.8	–	–	0.005	–	0.05	–	–
	C85700	58.0-63.0 ^{B,F}	0.50-1.5	0.80-1.5	33.0-40.0	0.50	–	0.8	–	–	0.80	–	0.05	–	–
	C85800	57.0 min ^{B,F}	1.5	1.5	31.0-41.0	0.50	0.05	0.50	0.05	0.01	0.50	0.25	0.25	–	As 0.05

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^D Cu + sum of named elements, 99.1%.

^E Cu + sum of named elements, 98.9%.

^F Cu + sum of named elements, 98.7%.



Manganese Bronze (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Manganese Bronze	C86200	60.0-66.0 ^{B,G}	0.10	0.10	22.0-28.0	2.0-4.0	–	0.8	–	–	3.0-4.9	2.5-5.0	–	–	–
	C86300	60.0-66.0 ^{B,G}	0.10	0.10	22.0-28.0	2.0-4.0	–	0.8	–	–	5.0-7.5	2.5-5.0	–	–	–
	C86400	56.0-62.0 ^{B,G}	0.50-1.0	0.50-1.3	34.0-42.0	0.40-2.0	–	0.8	–	–	0.50-1.5	0.10-1.5	–	–	–
	C86500	55.0-60.0 ^{B,G}	1.0	0.30	36.0-42.0	0.40-2.0	–	0.8	–	–	0.50-1.5	0.10-1.5	–	–	–
	C86700	55.0-60.0 ^{B,G}	1.5	0.50-1.5	30.0-38.0	1.0-3.0	–	0.8	–	–	1.0-3.0	1.0-3.5	–	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^G Total named elements = 99.0% min.



Silicon Brass and Bronze (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Silicon Brass and Bronze	C87300	94.0 min ^H	–	0.09	0.25	0.20	–	–	–	–	–	0.8-1.5	3.5-4.5	–	–
	C87400	79.0 min ^I	–	1.0	12.0-16.0	–	–	–	–	–	0.50	–	2.5-4.0	–	–
	C87500	79.0 min ^H	–	0.50	12.0-16.0	–	–	–	–	–	0.50	–	3.0-5.0	–	–
	C87600	88.0 min ^H	–	0.09	4.0-7.0	0.20	–	–	–	–	–	0.25	3.5-5.5	–	–
	C87610	90.0 min ^H	–	0.09	3.0-5.0	0.20	–	–	–	–	–	0.25	3.0-5.0	–	–
	C87800	80.0 min ^H	0.25	0.09	12.0-16.0	0.15	0.05	0.20	0.05	0.01	0.15	0.15	3.8-4.2	–	0.05As,0.01Mg

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^H Total named elements = 99.5% min.

^I Cu + sum of named elements, 99.2%.



Bismuth Brass (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Bismuth Brass	C89320	87.0-91.0 ^H	5.0-7.0	0.09	1.0	0.20	0.35	1.0	0.08	0.30	0.005		0.005	4.0-6.0	–
	C89325	84.0-88.0	9.0-11.0	0.10	1.00	0.15	0.50	1.0	0.08	0.10	0.005	–	0.005	2.7-3.7	–
	C89510	86.0-88.0 ^H	4.0-6.0	0.10	4.0-6.0	0.30	0.25	1.0	0.08	0.05	0.005	–	0.005	0.5-1.5 ^J	Se ^K 0.35-0.75
	C89520	85.0-87.0 ^H	4.0-6.0	0.10	4.0-6.0	0.30	0.25	1.0	0.08	0.05	0.005	–	0.005	1.6-2.2 ^J	Se ^K 0.8-1.1
	C89530	84.0-89.0 ^L	3.5-6.0	0.10	7.0-9.0	0.30	0.20	1.0	–	0.05	0.01	–	0.01	1.0-2.0	Se 0.10-0.30
	C89535	84.0-89.0 ^L	2.5-5.5	0.10	5.0-9.0	0.30	0.20	0.30-1.0	–	0.10-0.40	0.010	–	0.010	0.8-2.0	Se 0.5
	C89540	58.0-64.0 ^H	1.2	0.10	32.0-38.0	0.50	–	1.0	–	–	0.10-0.60	–	–	0.6-1.2	Se 0.10
	C89831	87.0-91.0	2.7-3.7	0.10	2.0-4.0	1.00	0.25	1.0	0.08	0.05	0.300	–	0.005	2.7-3.7	–
	C89833	87.0-91.0	4.0-6.0	0.09	2.0-4.0	0.30	0.25	1.0	0.08	0.05	0.005	–	0.005	1.7-2.7	–
	C89835	85.0-89.0	6.0-7.5	0.10	2.0-4.0	0.20	0.35	1.0	0.08	0.10	0.005	–	0.005	1.7-2.7	–
	C89836	87.0-91.0 ^H	4.5-7.0	0.10	2.0-4.0	0.35	0.25	0.90	0.08	0.06	0.005	–	0.005	1.5-2.5	–
	C89837	84.0-88.0	3.0-4.0	0.10	6.0-10.0	0.30	0.25	1.0	0.08	0.05	0.005	–	0.005	0.7-1.2	–
	C89844	83.0-86.0 ^{B,C}	3.0-5.0	0.10	7.0-10.0	0.30	0.25	1.0	0.08	0.05	0.005	–	0.005	0.7-1.2	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^C Cu + sum of named elements, 99.3%.

^H Total named elements = 99.5% min.



Tin Bronze (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Tin Bronze	C90300	86.0-89.0 ^{B,M}	7.8-9.0	0.25	3.5-5.0	0.15	0.20	0.8	0.05	0.03	0.005	–	0.005	–	–
	C90500	86.0-89.0 ^{B,N}	9.5-10.5	0.25	1.5-3.0	0.15	0.20	0.8	0.05	0.03	0.005	–	0.005	–	–
	C90700	88.0-90.0 ^{B,M}	10.3-12.0	0.50	0.50	0.15	0.20	0.50	0.05	0.30	0.005	–	0.005	–	–
	C90800	85.0-89.0 ^{B,M,Q}	11.3-13.0	0.25	0.25	0.15	0.10	0.50	0.05	0.30	0.005	–	0.005	–	–
	C91000	84.0-86.0 ^{B,M}	14.3-16.0	0.20	1.50	0.10	0.10	0.8	0.05	0.30	0.005	–	0.005	–	–
	C91100	82.0-85.0 ^{B,M}	15.3-17.0	0.25	0.25	0.15	0.20	0.50	0.05	1.00	0.005	–	0.005	–	–
	C91600	86.0-89.0 ^{B,J}	10.0-10.8	0.25	0.25	0.15	0.10	1.2-2.0	0.05	0.25	0.005	–	0.005	–	–
	C91700	84.0-87.0 ^{B,M,Q}	11.5-12.5	0.25	0.25	0.15	0.10	1.2-2.0	0.05	0.30	0.005	–	0.005	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^J Experience favors Bi:Se > =2:1.

^M Cu + sum of named elements, 99.4 %.

^N Cu + sum of named elements, 99.7 %.

^Q Cu + Sn + Pb + Ni + P = 99.5 % min.



Leaded Tin Bronze (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Leaded Tin Bronze	C92200	86.0-89.0 ^{B,H}	5.8-6.5	1.0-1.8	3.5-5.0	0.20	0.20	0.8	0.05	0.03	0.005	–	0.005	–	–
	C92300	85.0-89.0 ^{B,H}	7.8-9.0	0.30-0.9	3.0-5.0	0.20	0.20	0.8	0.05	0.03	0.005	–	0.005	–	–
	C92500	85.0-88.0 ^{B,C}	10.3-12.0	1.0-1.5	0.50	0.20	0.20	0.8-1.5	0.05	0.30	0.005	–	0.005	–	–
	C92600	86.0-88.5 ^{B,C}	9.3-10.5	0.80-1.5	1.3-2.5	0.20	0.25	0.7	0.05	0.03	0.005	–	0.005	–	–
	C92700	86.0-89.0 ^{B,C}	9.3-11.0	1.0-2.3	0.8	0.15	0.20	0.8	0.05	0.25	0.005	–	0.005	–	–
	C92800	78.0-82.0 ^{B,C}	15.3-17.0	4.0-5.7	0.80	0.15	0.20	0.8	0.05	0.05	0.005	–	0.005	–	–
	C92900	82.0-86.0 ^{B,C,Q}	9.3-11.0	2.0-3.0	0.25	0.15	0.10	2.8-4.0	0.05	0.50	0.005	–	0.005	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^C Cu + sum of named elements, 99.3%.

^H Total named elements = 99.5% min.

^Q Cu + Sn + Pb + Ni + P = 99.5% min.



High Leaded Tin Bronze (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
High Leaded Tin Bronze	C93200	82.0-84.0B,G	6.5-7.5	6.5-7.7	2.5-4.0	0.20	0.30	0.8	0.08	0.03	0.005	–	0.005	–	–
	C93400	82.0-85.0B,G	7.3-9.0	7.0-8.7	0.8	0.20	0.30	0.8	0.08	0.03	0.005	–	0.005	–	–
	C93500	83.0-85.0B,G	4.5-5.5	8.5-9.7	0.50-1.5	0.10	0.30	0.8	0.08	0.04	0.005	–	0.005	–	–
	C93600	79.0-82.0C	6.3-7.7	11.3-13.0	1.0	0.15	0.50	0.8	0.08	0.05	0.005	–	0.005	–	–
	C93700	78.0-81.0B,G	9.3-10.7	8.3-10.7	0.8	0.10	0.50	0.50	0.08	0.05	0.005	–	0.005	–	–
	C93800	76.0-79.0G	6.5-7.5	14.0-16.0	0.8	0.10	0.50	0.8	0.08	0.05	0.005	–	0.005	–	–
	C93900	76.5-79.5E	5.3-7.0	14.0-17.7	1.5	0.35	0.50	0.8	0.08	0.05	0.005	–	0.005	–	–
	C94000	69.0-72.0F	12.3-14.0	14.0-15.7	0.50	0.25	0.50	0.50-1.0	0.08	0.05	0.005	–	0.005	–	–
	C94100	74.0-79.0F	4.7-6.5	15.0-21.7	1.0	0.10	0.7	0.8	0.08	0.05	0.005	–	0.005	–	–
	C94300	69.0-72.0B,G	4.7-5.8	23.0-27.0	0.8	0.10	0.7	0.8	0.08	0.05	0.005	–	0.005	–	–
	C94400	78.0-82.0G	7.3-9.0	9.0-11.7	0.8	0.10	0.7	0.8	0.08	0.05	0.005	–	0.005	–	–
C94500	70.0-75.0G	6.3-8.0	16.0-21.5	1.0	0.10	0.7	0.8	0.08	0.05	0.005	–	0.005	–	–	

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^B In determining Cu minimum, can be calculated as Cu + Ni.

^C Cu + sum of named elements, 99.3%.

^H Total named elements = 99.5% min.

^Q Cu + Sn + Pb + Ni + P = 99.5% min.



Aluminum Bronze (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others	
Aluminum Bronze	C95200	86.0min ^G	–	–	–	2.5-4.0	–	–	–	–	8.5-9.5	–	–	–	–	
	C95300	86.0min ^G	–	–	–	0.8-1.5	–	–	–	–	9.0-11.0	–	–	–	–	
	C95400	83.0min ^H	–	–	–	3.0-5.0	–	1.5	–	–	10.0-11.5	0.50	–	–	–	
	C95410	83.0min ^H	–	–	–	3.0-5.0	–	1.5-2.5	–	–	10.0-11.5	0.50	–	–	–	
	C95500	78.0min ^H	–	–	–	3.0-5.0	–	3.0-5.5	–	–	10.0-11.5	3.5	–	–	–	
	C95520	74.5min ^{S,H}	0.25	0.03	0.30	4.0-5.5	–	4.2-6.0	–	–	10.5-11.5	1.5	0.150	–	–	
	C95600	88.0min ^G	–	–	–	–	–	0.25	–	–	6.0-8.0	–	1.8-3.2	–	–	
	C95700	71.0min ^H	–	0.03	–	–	2.0-4.0	–	1.5-3.0	–	–	7.0-8.5	11.0-14.0	0.10	–	–
	C95800	79.0min ^H	–	0.02	–	–	3.5-4.5T	–	4.0-5.0T	–	–	8.5-9.5	0.8-1.5	0.05	–	–
	C95900	Remainder ^H	–	–	–	–	3.0-5.0	–	0.50	–	–	12.0-13.5	1.50	–	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^G Total named elements = 99.0% min.

^H Total named elements = 99.5% min.

^S Cr will be 0.05 max and Co 0.20 max.

^T Ni > Fe



Cupro Nickel and Monel (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others	C	Mg	Nb
Cupro Nickel and Monel	C96200	84.5-87.0 ^H	–	0.005	–	1.0-1.8	–	9.0-11.0	0.02	0.02	0.005	0.8-1.5	0.25	–	–	0.05	–	1.0
	C96400	65.0-67.0 ^H	–	0.005	–	0.25-1.0	–	29.5-31.5	0.02	0.02	0.005	0.8-1.5	0.30-0.50	–	–	0.05	–	0.5-1.5
	M-35-1 ^A	26.0-33.0	–	–	–	3.50	–	Balance	0.03	0.03	0.50-3.0	1.5	1.25	–	–	0.35	–	0.5
	M-35-2	26.0-33.0	–	–	–	3.50	–	Balance	0.03	0.03	0.25-3.0	1.5	2.00	–	–	0.35	–	0.5
	M-30H	27.0-33.0	–	–	–	3.50	–	Balance	0.03	0.03	0.50-3.0	1.5	2.7-3.7	–	–	0.30	–	–
	M-25S	27.0-33.0	–	–	–	3.50	–	Balance	0.03	0.03	0.25-3.0	1.5	3.5-4.5	–	–	0.25	–	1.0-3.0
	M-30C ^A	26.0-33.0	–	–	–	3.50	–	Balance	0.03	0.03	0.50-3.0	1.5	1.0-2.0	–	–	0.30	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^A Best application; M-35-1 or M-30C when weldability is required

^H Total named elements = 99.5 % min.



Nickel Silver (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Nickel Silver	C97300	53.0-58.0 ^G	1.5-3.0	8.0-11.0	17.0-25.0	1.0	0.35	11.0-14.0	0.08	0.05	0.005	0.50	0.05	-	-
	C97600	63.0-66.0 ^N	3.5-4.5	3.5-5.0	3.0-9.0	1.0	0.25	19.5-21.0	0.08	0.05	0.005	1.0	0.05	-	-
	C97800	64.067.0 ^U	4.0-5.5	1.0-2.5	1.0-4.0	1.5	0.20	24.0-27.0	0.08	0.05	0.005	1.0	0.05	-	-

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^G Total named elements = 99.0% min.

^H Total named elements = 99.5% min.

^S Cr will be 0.05 max and Co 0.20 max.

^T Ni > Fe



Other Alloys (% Max. unless shown as range or min.)

Family	Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Sb%	Ni%	S%	P%	Al%	Mn%	Si%	Bi%	Others
Other Alloys	C94700	86.0-89.0 ^F	4.7-6.0	0.08R	1.3-2.5	0.20	0.10	4.5-6.0	0.05	0.05	0.005	0.20	0.005	–	–
	C94800	85.0-89.0 ^F	4.7-6.0	0.30-0.9	1.3-2.5	0.20	0.10	4.5-6.0	0.05	0.05	0.005	0.20	0.005	–	–
	C94900	79.0-81.0 ^M	4.3-6.0	4.0-5.7	4.3-6.0	0.25	0.25	4.5-6.0	0.08	0.05	0.005	0.10	0.005	–	–
	C99400	Remainer ^N	–	0.09	0.50-5.0	1.0-3.0	–	1.0-3.5 ^P	–	–	0.50-2.0	0.50	0.50-2.0	–	–
	C99500	Remainer ^N	–	0.09	0.50-2.0	3.0-5.0	–	3.5-5.5 ^P	–	–	0.50-2.0	0.50	0.50-2.0	–	–
	C99700	54.0min ^N	1.0	2.00	19.0-25.0	1.0	–	4.0-6.0 ^P	–	–	0.50-3.0	11.0-15.0	–	–	–
	C99750	55.0-61.0 ^N	–	0.50-2.5	17.0-23.0	1.0	–	5.0 ^P	–	–	0.25-3.0	17.0-23.0	–	–	–

© The Federal Metal Company • 7250 Division Street • Bedford, Ohio 44146 • United States • Contact 800.736.6636 or visit us at: www.federalmetal.com

^F Cu + sum of named elements, 98.7%.

^G Total named elements = 99.0% min.

^M Cu + sum of named elements, 99.4%.

^N Cu + sum of named elements, 99.7%.

^U Cu + sum of named elements, 99.6%.