

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	Impurities
Aluminium Bronze		IS:305-1981										
AB-1	Rem.	0.1	0.05	0.5	1.5-3.5	1		8.5-10.5	1	0.25		0.3
AB-2	Rem.	0.1	0.05	0.5	4.5-5	4.5-5		8.8-10	1.5	0.10		0.3
		IS:3091-1963										
Al.Bronze	Rem.				4.5			9-11	0.1-0.5			
		IS:8631-1977										
Grade-1	Rem.	0.1	0.05	0.5	4.5-5	4.5-5		8.8-10	1	0.1		
Tin Bronze		IS:1458-1965										
Ph. Bz. Class-1	Rem.	6-8	0.5	0.5	0.3		0.4-0.6	0.01		0.1		0.6
		IS:28-1965										
Phosphorus Bz (Grade-1)	Rem	6-8	0.25	0.5	0.3	0.7	0.3-0.5	0.1		0.02	0.1	1.2
Phosphorus Bz (Grade-2)	Rem.	10 Min	0.25	0.05	0.1	0.1	0.5Min	0.1		0.02		0.6
Phosphorus Bz (Grade-3)	Rem.	6.5-8.5	2-5	2		1	0.3Min					0.5
Phosphorus Bz (Grade-4)	Rem.	9-11	0.25	0.05		0.25	0.15					0.8
Phosphorus Bz (Grade-5)	Rem.	11-13.1	0.5	0.3	0.15	0.5	0.15Min	0.1		0.02		0.2
Gun Metal		IS:1458-1965										
Gun Metal Class 2	Rem.	5-7	1.3	2.3	0.3		0.05	0.01			0.1	0.6
		IS:318-1981										
LTB-1	Rem.	6-8	2.5-3.5	1.5-3	0.3	2		0.01		0.01	0.3	0.7
LTB-2	Rem.	4-6	4-6	4-6	0.35	2		0.01		0.02	0.4	0.8
Leaded Bronze		IS:1458-1965										
Leaded Bz. Class-3	Rem.	6-8	14-16	0.5	0.3		0.05	0.01			0.4	0.7
Leaded Bz. Class-4	Rem.	6-8	9-11	0.5	0.3		0.05	0.01			0.4	0.7
Leaded GM Class-5	Rem.	4-6	4-6	4-6	0.3		0.05	0.01			0.3	0.6
		IS:318-1981										
LTB-3	Rem.	6-8	9-11	0.75	0.35	2		0.01		0.02	0.05	0.8
LTB-4	Rem.	6-8	14-16	0.75	0.35	2				0.02	0.05	0.8
LTB-5	Rem.	9-11	8.5-11	1	0.35	2		0.01		0.02	0.05	0.8
LTB-6	Rem.	4-6	18-23	1	0.35	2				0.01	0.05	0.8
Silicon Bronze		IS:1028-1987										
Silicon Bronze	89 Min	1	0.5	5	2.5			1.5	1.5	1-5		
Brass		IS:8631-1977										
Grade 2	55 Min	1	0.5	Rem.	0.7-2	1		0.5-2.5	3	0.1		
		IS:292-1983										
LCB-1	70-77	1-3	2-5	Rem.	0.5			0.01				
LCB-2	63-67	1.5	1-3	Rem.	0.5			0.01				
High Tensile Brass		IS:304-1981										
HTB-1	55 Min	1	0.5	Rem.	0.7-2			0.5-2.5	3	0.1		0.2
	55 Min	0.2	0.2	Rem.	1.5-3.2.5			3.6	4	0.1		0.2
Silicon Brass		IS:11109-1984										
Silicon Brass (Grade-1)	79 Min		0.5	12.5-16	0.3			0.5		3.2-5		0.5
Silicon Brass (Grade-2)	88 Min		0.5	4.5-7	0.3					3.7-5.5		0.5
Silicon Brass (Grade-3)	80 - 83		0.4	Rem.	0.3			0.05		4.1-4.7		0.5

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI	Cr	Impurities
Aluminium Bronze															
AB-1	Rem.	0.1	0.05	0.5	1.5-3.5	1		8.5-10.5	1	0.25					0.3
AB-2	Rem.	0.1	0.05	0.5	4.5-5	4.5-5		8.8-10	1.5	0.10					0.3
AB-3	Rem.	0.1	0.03	0.4	0.5-0.7	0.1		6-6.4	0.5	2-2.4					0.8
Tin Bronze and Ni Tin Bronze															
CT-1	Rem.	9-114	0.25	0.05		0.25	0.15								0.8
CT-2	85-87.3	11.2-13	0.2	0.4	0.15	1.5-2	0.05	0.01	0.2	0.01	0.1	0.5			0.8
G1(88/10/2)	Rem.	9.5-10.5	1.5	1.75-2.75	0.15	1		0.01		0.02	0.2		0.03		0.5
G 3	Rem.	6.5-7.5	0.1-0.5	1.5-3		5.25-5.75	0.02	0.01	0.2	0.01	0.2		0.02		0.5
G 3 WP	Rem.	6.5-7.5	0.1-0.5	1.5-3		5.25-5.75	0.5	0.01	0.2	0.01	0.2		0.02		0.5
Pb1	Rem.	10 Min	0.25	0.05	0.1	0.1	0.5 Min	0.01		0.02					0.6
Pb2	Rem.	11 - 13	0.5	0.3	0.15	0.5	0.15 Min	0.01		0.02					0.2
PB-4	Rem.	9.5 Min	0.75	0.5		0.5	0.4 Min								0.5
Gun Metal															
LG-1	Rem.	2-3.5	4.6	7-9.5	0.5	2	0.03	0.01		0.02	0.25	0.1	0.1		1
LG-2	Rem.	4.6	4.6	4.6	0.5	2		0.01		0.02			0.05		0.8
LG-4	Rem.	6-8.05	2.5-3.5	1.5-3	0.2	2		0.01		0.01	0.25		0.05		0.7
Leaded Bronze															
LB-1	Rem.	8-10	13-17	1		2	0.1			0.02					0.3
LB-2	Rem.	9-11	8.5-11	1	0.15	2	0.1	0.01		0.02	0.5				0.5
LB-4	Rem.	4-6	8-10	2		2	0.1			0.02	0.5				0.5
LB-5	Rem.	4-6	18-23	1		2	0.1			0.01	0.5				0.3
LPB-1	Rem.	6.5-8.5	2-5	2		2	0.3-0.6								0.5
Brass															
DCB 1	59-63		0.25	Rem.				0.5							0.75
DCB 3	58-63	1	0.5-2.5	Rem.	0.8	1		0.2-0.8	0.5	0.05					2
PCB 1	57-60	0.5	0.5-2.5	Rem.	0.3			0.5							0.5
SCB 1	70-80	1-3	2-5	Rem.	0.75	1		0.01							1
SCB 3	63-70	1.5	1-3	Rem.	0.75	1		0.1							1
SCB 4	60-63	1-1.5	0.5	Rem.				0.01							0.75
SCB 6	83-88		0.5	Rem.											1
High Tensile Brass															
HTB-1	55 Min	1	0.5	Rem.	0.7-2	1		0.5-2.5	0.1-3	0.1					0.2
HTB-3	55 Min	0.2	0.2	Rem.	1.5-3.25	1		3-6	1.5-4	0.1					0.2
Cu Chromium															
CC1 - WP	Rem.													0.6-1.2	
Cu Mn Aluminum															
CMA 1	Rem.	1	0.05	0.5	2-4	1.5-4.5	0.05	7.5-8.5	11-15	0.15					0.3
CMA 2	Rem.	1	0.05	0.5	2-4	1.5-4.5	0.05	8.5-9	11-15	0.15					0.3

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB
Aluminium Bronze H2206											
ALBC-1	85-90	0.1	0.1	0.5	1-3	0.1-1		8-10	0.1-1		
ALBC-2	80-88	0.1	0.1	0.5	2.5-5	1-3		8-10.5	0.1-1.5		
ALBC-3	75-85	0.1	0.1	0.5	3-6	3-6		8.5-10.5	0.1-1.5		
ALBC-4	71-84	0.1	0.1	0.5	2-5	1-4		6-9	7-15		
Tin Bronze H2203											
BC-2	86-90	7-9	1	3-5	0.2	1	0.05	0.01		0.01	0.2
BC-3	86.5-89.5	9-11	1	1-3	0.2	1	0.05	0.01		0.01	0.2
H2204											
PBC2	87-91	9-12	0.3	0.3	0.2	1	0.05-0.2	0.01		0.01	0.05
PBC3	84-88	12-15	0.3	0.3	0.2	1	0.15-0.5	0.01		0.01	0.05
Gun Metal H2203											
BC-1	79-83	2-4	3-7	8-12	0.35	1	0.05	0.01		0.01	0.2
BC-6	83-87	4-6	4-6	4-6	0.3	1	0.05	0.01		0.01	0.2
BC-7	86-90	5-7	1-3	1-3	0.2	1	0.05	0.01		0.01	0.2
Leaded Bronze H2207											
LBC2	82-86	9-11	4-6	1	0.3	1	0.1	0.01		0.01	0.3
LBC2	77-81	9-11	9-11	1	0.3	1	0.1	0.01		0.01	0.5
LBC4	74-78	7-9	14-16	1	0.3	1	0.1	0.01		0.01	0.5
LBC5	70-76	6-8	16-22	1	0.3	1	0.1	0.01		0.01	0.5
High Tensile Brass											
HBsC1	55-60	1	0.4	33-42	0.5-1.5	1		0.5-1.5	0.1-1.5	0.1	
HBsC2	55-60	1	0.4	30-42	0.5-2	1		0.5-2	0.1-3.5	0.1	
HBsC3	60-65	0.5	0.2	22-28	2-4	0.5		3-5	2.5-5	0.1	
HBsC4	60-65	0.2	0.2	22-28	2-4	0.5		5-7.5	2.5-5	0.1	
Copper											
CuC1	99.5 Min	0.4	0.07								
CuC2	99.7 Min	0.2	0.07								
CuC3	99.9 Min		0.04								
Brass											
SzBC1	84-88	0.1		9-11				0.5		3.5-4.5	
SzBC2	78.5-82.5	0.3		14-16				0.3		4-5	
SzBC3	80-84	0.2		13-15	0.3			0.3	0.2	3.2-4.2	
H2207											
YBsC1	83-88	0.1	0.5	11-17	0.2	0.2		0.2			
YBsC2	65-70	1	0.5-3	25-34	0.8	1		0.5			
YBsC3	58-64	1	0.5-3	30-41	0.8	1		0.5			

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI	Cr
Aluminium Bronze														
CuAl10Fe2(CB331G)	83-89	0.2	0.03	0.5	1.5-3.3	1.5		8.7-10.5	1	0.15				
CuAl10Fe5Ni5(CB333G)	76-82.5	0.1	0.03	0.4	4-5.3	4-5.5		8.8-10	2.5	0.1			0.01	0.05
CuAl10Ni3Fe2(CB332G)	80-85.5	0.2	0.03	0.5	1-2.8	1.5-4		8.7-10.5	2	0.15				
CuAl11Fe6Ni6(CB334G)	72-77	0.2	0.04	0.4	4.2-7	4.3-7.5		10.3-12	0-2.5	0.1				
CuAl9(CB330G)	88-91.5	0.25	0.25	0.4	1	1		8.2-10.5	0.5	0.15				
Tin Bronze														
CuSn10(CB480K)	88.5-90.5	9.3-11	0.8	0.5	0.15	1.8	0.05	0.01	0.1	0.01	0.15	0.04		
CuSn11P(CB481K)	87-89.3	10.2-11.5	0.25	0.05	0.1	0.1	0.6-1	0.01	0.05	0.01	0.05	0.05		
CuSn12(CB483K)	85.5-88.5	11.2-13	0.6	0.4	0.15	2	0.2	0.01	0.2	0.01	0.15	0.05		
CuSn12Ni2(CB484K)	84-87	11.3-13	0.2	0.3	0.15	1.5-2.4	0.05	0.01	0.1	0.01	0.05	0.04		
Gun Metal														
CuSn5Zn5Pb5(CB491K)	83-86.5	4.2-6	4.2-5.8	4.5-6.5	0.25	2	0.03	0.01		0.01	0.25	0.08		
CuSn6Zn4Pb2(CB498K)	86-89.5	5.7-6.5	1.2-2	3.2-5	0.25	1	0.03	0.01		0.01	0.25	0.08		
CuSn7Zn2Pb3(CB492K)	85-88.5	6.2-8.0	2.7-3.5	1.7-3.2	0.2	2	0.03	0.01		0.01	0.25	0.08		
CuSn7Zn4Pb7(CB493K)	81-84.5	6.2-8	5.2-8	2.3-5	0.2	2	0.03	0.01		0.01	0.3	0.08		
Leaded Tin Bronze														
CuSn10Pb10(CB495K)	78-81.5	9.2-11	8.2-10.5	2	0.2	2	0.1	0.01	0.2	0.01	0.5	0.08		
CuSn11Pb2(CB482K)	83.5-86.5	10.7-12.5	0.7-2.5	2	0.15	2	0.05	0.01	0.2	0.01	0.2	0.08		
CuSn3Zn8Pb5(CB490K)	81-85.5	2.2-3.5	3.5-5.8	7.5-10	0.5	2	0.03	0.01		0.01	0.25	0.08		
CuSn5Pb20(CB497K)	70-77.5	4.2-6	19-23	2	0.2	0.5-2.5	0.1	0.01	0.2	0.01	0.75	0.08		
CuSn5Pb9(CB494K)	80-86.5	4.2-6	8.2-10	2	0.2	2	0.1	0.01	0.2	0.01	0.5	0.08		
CuSn7Pb15(CB496K)	74-79.5	6.2-8	13.2-17	2	0.2	0.5-2	0.1	0.01	0.2	0.01	0.5	0.08		
Brass														
CuZn16Si4(CB761S)	78.5-82	0.25	0.6	REM.	0.5	1	0.02	0.1	0.2	3-5	0.05			
CuZn33Pb2(CB750S)	63-66	1.5	1-2.8	REM.	0.7	1	0.02	0.1	0.2	0.04				
CuZn33Pb2Si(CB751S)	63.5-65.5	0.8	0.8-2	REM.	0.25-0.5	0.8		0.1	0.1	0.70-1	0.05			
CuZn35Pb2Al(CB752S)	61.5-65	0.4	1.5-2.4	REM.	0.3	0.25		0.3-0.7	0.15	0.02	0.04-0.12			
CuZn37Al1(CB766S)	60-63	0.4	0.4	REM.	0.4	1.8	0.02	0.6-1.8	0.4	0.5	0.05			
CuZn37Pb2Ni1AlFe(CB753S)	58-60	0.8	1.8-2.5	REM.	0.5-0.8	0.5-1.2	0.02	0.4-0.8	0.2	0.05	0.05			
CuZn38Al(CB767S)	59-64	0.1	0.1	REM.	0.4	0.8	0.05	0.1-0.8	0.4	0.05				
CuZn39Pb1Al(CB754S)	58-62	0.1	0.5-2.4	REM.	0.7	1	0.02	0.1-0.8	0.5	0.05				
CuZn39Pb1AlB(CB755S)	59-60.5	0.3	1.2-1.7	REM.	0.05-0.2	0.2		0.4-0.65	0.05	0.03				
High Tensile Brass														
CuZn25Al5Mn4Fe3(CB762S)	60-66	0.2	0.2	REM.	1.5-3.5	2.7	0.02	4-7	3-5	0.08	0.03			
CuZn32Al2Mn2Fe1(CB763S)	59-67	1	1	REM.	0.5-2	2.5		1-2.5	1-3.5	1	0.08			
CuZn34Mn3Al2Fe1(CB764S)	55-65	0.3	0.2	REM.	0.8-2	2.7	0.02	1.5-3	1-3.5	0.08	0.05			
CuZn35Mn2Al1Fe1(CB765S)	56-64	0.8	0.5	REM.	0.5-1.8	6	0.02	0.7-2.2	0.5-2.5	0.1	0.08			

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	Impurities
Aluminium Bronze													
CuAl10Fe1(CW305G)	Rem.	0.1	0.02	0.5	0.5-1.5	1		9-10	0.5	0.2			0.2
CuAl10Fe3Mn2(CW306G)	Rem.	0.1	0.05	0.5	2-4	1		9-11	1.5-3.5	0.2			0.2
CuAl10Ni5Fe4(CW307G)	Rem.	0.1	0.05	0.4	3-5	4-6		8.5-11	1	0.2			0.2
CuAl10Fe5Ni5	76-82.5	0.1	0.03	0.4	4-5.3	4-5.5		8.8-10	2.5	0.1			
CuAl11Fe6Ni6(CW308G)	Rem.	0.1	0.05	0.5	5-7	5-7		10.5-12.5	1.5	0.2			0.2
CuAl11Ni6Fe5	Rem.		0.15	0.5	4.8-7.3	5-7.5		10.5-12.5	1.5	0.2			0.3
CuAl5	92.5-96	0.3	0.02	0.5	0.4	0.8		4-6	0.3	0.2			0.3
CuAl5As(CW300G)	Rem.	0.05	0.02	0.3	0.2	0.2		4-6.5	0.2				0.3
CuAl6Si2Fe(CW301G)	Rem.	0.1	0.05	0.4	0.5-0.7	0.1		6-6.4	0.1	2-2.4			0.2
CuAl7Si2(CW302G)	Rem.	0.2	0.05	0.5	0.3	0.2		6.3-7.6	0.2	1.5-2.2			0.2
CuAl8	Rem.		0.02	0.5	0.5	0.8		7-9	0.8	0.2			0.3
CuAl8Fe	Rem.	0.2	0.15	0.5	1.5-3.5	1		6.5-9	1	0.2			0.3
CuAl8Fe3(CW303G)	Rem.	0.1	0.05	0.5	1.5-3.5	1		6.5-8.5	1	0.2			0.2
CuAl9Fe3Mn2	Rem.		0.05	0.5	2-4	1		9-11	1.5-3.5	0.2			0.3
CuAl9Mn	Rem.		0.15	0.5	1.5	0.8		8-10	1.5-3	0.2			0.3
CuAl9Ni3Fe2(CW304G)	Rem.	0.1	0.05	0.2	1-3	2-4		8-9.5	2.5	0.1			0.3
G-CuAl10Fe	83-89	0.2	0.1	0.4	2-3.8	2.7		8.7-10.7	0.8	0.1			1
G-CuAl10Ni	76-80.5	0.1	0.03	0.2	3.5-5.3	4.5-6.3		9-10.6	2.3	0.07			0.8
G-CuAl11Ni	72-77	0.1	0.03	0.2	4.3-5.8	5.3-6.8		9.3-11.3	2.3	0.07			0.8
G-CuAl8Mn	82-84.5	0.1	0.05	0.15	0.6	1.2-1.8		7.3-8.8	5.3-6.5	0.05			0.8
G-CuAl9Ni	82-86.5	0.2	0.1	0.2	1-2.8	1.5-3.8		8.7-9.8	2.3	0.07			0.8
Lead Bronze													
GbCuSn10	88.5-90.5	9.3-11	0.8	0.5	0.15	1.8	0.05	0.01	0.1	0.01	0.15	0.04	
CuSn4(CW450K)	Rem.	3.5-4.5	0.02	0.2	0.1	0.2	0.01-0.4						0.2
CuSn5(CW451K)	Rem.	4.5-5.5	0.02	0.2	0.1	0.2	0.01-0.4						0.2
CuSn5Pb1(CW458K)	Rem.	3.5-5.5	0.5-1.5	0.3	0.1	0.2	0.01-0.4						0.2
CuSn6	86-89.5	5.7-6.5	1.2-2	3.2-5	0.25	1	0.03	0.01		0.01		0.08	
CuSn6(CW452K)	Rem.	5.5-7	0.02	0.2	0.1	0.2	0.01-0.4						0.2
CuSn8(CW453K)	Rem.	7.5-8.5	0.02	0.2	0.1	0.2	0.01-0.4						0.2
CuSn8P(CW459K)	Rem.	7.5-8.5	0.05	0.3	0.1	0.3	0.2-0.4						0.2
CuSn8PbP(CW460K)	Rem.	7.5-9	0.1-0.5	0.3	0.1	0.3	0.2-0.4						0.2
CuSnPb2P(CW455K)	Rem.	3.5-4.5	1.5-2.5	0.3	0.1	0.2	0.2-0.4						0.2
GbCuSn12	86-88	11.3-13	0.8	0.5	0.15	1.8	0.05	0.01	0.1	0.01	0.15	0.04	
GbCuSn12-B	Rem.	11.8-13	0.8-1		0.15	1-1.5	0.06	0.01	0.1	0.01	0.15	0.03	
GbCuSn12Ni	84-87	11.3-13	0.15	0.3	0.15	1.5-2.4	0.05	0.01	0.1	0.01	0.05	0.04	
G-CuSn10Zn	86-88.5	9.2-11	1.3	1-3	0.2	1.8	0.03	0.01	0.1		0.25	0.06	
G-CuSn12Pb	84.3-87.3	11.3-13	1.2-2	0.5	0.15	1.8	0.05	0.01	0.1	0.01	0.15	0.04	
G-SnBz10	89-91	9-11											
G-SnBz12	87-89	11-13											
G-SnBz14	85-87	13-15											
G-SnBz20	78-80	20-22											
RG-10	85-87	9-11		4									

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	Impurities
Gun Metal													
G-CuSnZnZnPb	80-85	1.5-3	4-6	7-9	0.3	1.5-2.5	0.03	0.01	0.1	0.01	0.25	0.06	
G-CuSn5ZnZnPb	83.5-86	4.3-6	4-6	4.5-6.5	0.2	2.3	0.03	0.01	0.1	0.01	0.25	0.06	
G-CuSn6ZnNi	83.5-87	5.8-7	2.5-4	1.5-3	0.2	1.5-2.5	0.03	0.01	0.1	0.01	0.3	0.06	
G-CuSn7ZnZnPb	81-84.5	6.3-8	5.3-7	3.3-5	0.2	1.8	0.03	0.01	0.1	0.01	0.25	0.06	
RG-2	83	2	8	5									
RG-4	92-94	3-5	1-2	2									
RG-5	84-86	4-6	4-6	4-6	0.2	2	0.03	0.01	0.1	0.01	0.25	0.06	
RG-5 (Low Lead)	Rem.	3.8-4.5	2.5-3	5.5-6.5	0.3	0.4-0.6	0.03	0.01	0.1	0.01	0.1	0.04	
RG-6	85	6	2	3		1							
RG-7	83-85	6-8	3-5	3-5									
RG-7B	Rem.	6.8-8	5.3-7	3.3-5	0.2	1-1.5	0.03	0.01	0.1	0.01	0.25	0.03	
RG-A	81-87	5-8	4-6	7									
Leaded Bronze													
G-CuPb10SN	78-81	9.2-11	8.5-10.5	0.8	0.15	1.3	0.03	0.01	0.1	0.01	0.3	0.08	0.5
G-CuPb15SN	75-78	7.3-9	13.5-16.5	2	0.15	1.8	0.03	0.01	0.1	0.01	0.4	0.08	0.5
G-CuPb20SN	70-75	3.7-5.5	18.5-23	2	0.15	2.3	0.03	0.01	0.1	0.01	0.4	0.08	0.5
G-CuPb22SN	70-80	0.5-3	18-26	0.5	0.7	2.5	0.03				0.2		1.2
G-CuPb5SN	84-86.5	9.5-11	4.3-5.8	0.8	0.15	1.3	0.03	0.01	0.1	0.01	0.25	0.08	0.5
G-PbBz25	Rem.	3	18-28	3	0.7	2.5	0.05				0.5		1
G-SnPbBz10	Rem.	9-11	8-12										
G-SnPbBz15	Rem.	6-8	13-18	3	0.25	2	0.05				0.5		0.5
G-SnPbBz20	69-77	3.5-5.5	18-23	3	0.25	2.5	0.05				0.5		0.5
G-SnPbBz22	Rem.	2.5	18-25										
G-SnPbBz5	Rem.	9-11	3-7							0.25			
Brass													
CuSn3Zn9(CW454K)	Rem.	1.5-3.5	0.1	7.5-10	0.1	0.2	0.2						0.2
CuZn10(CW501L)	89-91	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn13Al1Ni1Si(CW700R)	81-84	0.1	0.05	Rem.	0.25	0.8-1.4		0.7-1.2	0.1	0.8-1.3			0.5
CuZn15(CW502L)	84-86	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn19Sn(CW701R)	80-82	0.2-0.5	0.05	Rem.	0.05	0.3							0.2
CuZn20(CW503L)	79-81	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn20Al2	70-72.5		0.07	Rem.	0.07	0.1	0.01	1.8-2.3	0.1				0.1
CuZn28(CW504L)	71-73	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn28Sn1	70-72.5	0.9-1.3	0.07	Rem.	0.07	0.1	0.01		0.1				0.1
CuZn30(CW505L)	69-71	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn33(CW506L)	66-68	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn35Pb1(CW600N)	62.5-64	0.1	0.8-1.6	Rem.	0.1	0.3		0.05					0.1
CuZn35Pb2(CW601N)	62-63.5	0.1	1.6-2.5	Rem.	0.1	0.3		0.05					0.1
CuZn36(CW507L)	63.5-65.5	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
CuZn36Pb2Sn1(CW711R)	59.5-61.5	0.5-1	1.3-2.2	Rem.	0.1	0.3							0.2
CuZn36Pb3(CW603N)	60-62	0.2	2.5-3.5	Rem.	0.3	0.3		0.05					0.2
CuZn36Sn1Pb(CW712R)	61-63	1-1.5	0.2-0.6	Rem.	0.1	0.2							0.2
CuZn37(CW508L)	62-64	0.1	0.1	Rem.	0.1	0.3		0.05					0.1

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	Impurities
Brass													
CuZn37Pb0.5(CW604N)	62-64	0.2	0.1-0.8	Rem.	0.1	0.3		0.05	0.1-3.5				0.2
CuZn37Pb1(CW605N)	61-62	0.2	0.8-1.6	Rem.	0.2	0.3		0.05	2.5-4				0.2
CuZn37Pb1Sn1(CW714R)	59-61	0.5-1	0.4-1	Rem.	0.1	0.3			11-15				0.2
CuZn37Pb2(CW606N)	61-62	0.2	1.6-2.5	Rem.	0.2	0.3		0.05	17-23				0.2
CuZn38Pb1(CW607N)	60-61	0.2	0.8-1.6	Rem.	0.2	0.3		0.05		0.2-0.4			0.2
CuZn38Pb2(CW608N)	60-61	0.2	1.6-2.5	Rem.	0.2	0.3		0.05		0.1-0.6			0.2
CuZn38Pb4(CW609N)	57-59	0.3	3.5-4.2	Rem.	0.3	0.3		0.05	0.1	0.8-1.3			0.2
CuZn38Sn1	59-62	0.5-1	0.2	Rem.	0.1	0.2			0.1	2.7-3.4			0.5
CuZn38SnA1	59-60.7	0.3-0.6	0.3-0.7	Rem.	0.1-0.4	0.2-0.5		0.1-0.5		3.5-4.5			0.5
CuZn39Pb0.5(CW610N)	59-60.5	0.2	0.2-0.8	Rem.	0.2	0.3		0.05		3.5-4.5			0.2
CuZn39Pb1(CW611N)	59-60	0.2	0.8-1.6	Rem.	0.2	0.3		0.05	0.4	2.5-3.5			0.2
CuZn39Pb2(CW612N)	59-60	0.3	1.6-2.5	Rem.	0.3	0.3		0.05	0.4	2.5-3.5			0.2
CuZn39Pb2Sn(CW613N)	59-60	0.2-0.5	1.6-2.5	Rem.	0.4	0.3		0.1	0.05	1.9-2.22			0.2
CuZn39Pb3(CW614N)	57-59	0.3	2.5-3.5	Rem.	0.3	0.3		0.05		2.5-4			0.2
CuZn39Pb3Sn(CW615N)	57-59	0.2-0.5	2.5-3.5	Rem.	0.4	0.3		0.1		3-5			0.2
CuZn39Sn1(CW719R)	59-61	0.5-1	0.2	Rem.	0.1	0.2			0.25	3.5-5.5			0.2
CuZn40(CW509L)	59.5-61.5	0.2	0.3	Rem.	0.2	0.3		0.05	0.25	3-5			0.2
CuZn40Pb1Al(CW616N)	57-59	0.2	1-2	Rem.	0.2	0.2		0.05-0.30	0.15	3.8-4.2	0.05	0.05	0.2
CuZn40Pb2(CW617N)	57-59	0.3	1.6-2.5	Rem.	0.3	0.3		0.05	0.1	2.7-3.4	0.1		0.2
CuZn40Pb2Al(CW618N)	57-59	0.3	1.6-3	Rem.	0.3	0.3		0.05-0.50		0.25-0.45			0.2
CuZn40Pb2Sn(CW619N)	57-59	0.2-0.5	1.6-2.5	Rem.	0.4	0.3		0.1		0.7-1.3			0.2
CuZn41Pb1Al(CW620N)	57-59	0.3	0.8-1.6	Rem.	0.3	0.3		0.05-0.50	0.1	1.5-2.1			0.2
CuZn42PbA1(CW621N)	57-59	0.3	0.2-0.8	Rem.	0.3	0.3		0.05-0.50	0.1	1.5-2.2			0.2
CuZn43Pb2(CW623N)	55-57	0.3	1.6-3	Rem.	0.3	0.3		0.05	0.1	1.5-2			0.2
CuZn43Pb2A1(CW624N)	55-57	0.3	1.6-3	Rem.	0.3	0.3		0.05-0.50		3.5-4.5			0.2
CuZn43PbA1(CW622N)	55-57	0.3	0.8-1.6	Rem.	0.3	0.3		0.05-0.50		1.8-3.2			0.2
CuZn5(CW500L)	94-96	0.1	0.05	Rem.	0.05	0.3		0.02					0.1
GB-CuZn33Pb	62.5-66	1.4	1.3-2.8	Rem.	0.7	0.8	0.02	0.03	0.1	0.03	0.05		1.8
GB-CuZn37Al1	60-63	0.4	0.4	Rem.	0.4	1.8	0.02	0.6-1.8	0.4	0.5	0.05		1.3
GB-CuZn37Pb	59-62	0.6	0.7-2.2	Rem.	0.4	0.8	0.02	0.4-0.8	0.1	0.03	0.05		1
GB-CuZn38Al1	59-62	0.08	0.04	Rem.	0.4	0.8	0.02	0.4-0.8	0.4	0.1	0.3		1
GB-CuZn39Pb	58-63	0.9	1.3-2.5	Rem.	0.7	0.8	0.02	0.3-0.7	0.1	0.05	0.05		1.8
GB-CuZn40Fe	56-61	0.8	0.8	Rem.	0.2-1	1.8	0.02	0.03	0.3	0.03	0.05		1
G-CuZn37Al1	60-64			Rem.		2		0.3-1.8					1.5
G-CuZn38Al	59-64			Rem.		1		0.1-0.8					1.2
High Tensile Brass													
G-CuZn34Al2	55-66			Rem.	0.5-2.5	3		1-3	0.3-4				0.5
G-CuZn34Al1	56-65			Rem.	0.5-2	2		0.5-2	0.3-3				1.5
CuZn23Al6	63-65.5		0.1	Rem.	2-3.5	0.5		5-7	3.5-5				0.2
CuZn23Al6Mn4Fe3Pb(CW704R)	63-65	0.2	0.2-0.8	Rem.	2-3.5	0.5		5-6	3.5-5	0.2			0.2
CuZn25Al5Fe2Mn2Pb(CW705R)	65-68	0.2	0.2-0.8	Rem.	0.5-3	1		4-5	0.5-3				0.3

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
High Tensile Brass													
CuZn35Ni2	58-61	0.5	0.8	Rem.	0.5	2-3		0.3-1.5	1.5-2.5	0.1			0.5
CuZn35Ni3Mn2AlPb(CW710R)	58-60	0.5	0.2-0.8	Rem.	0.5	2-3		0.3-1.3	1.5-2.5	0.1			0.3
CuZn38Al1	59-61.5	0.3	1	Rem.	1	0.6		0.3-1.3	0.6-1.6	0.5			0.5
CuZn38Mn1Al(CW716R)	59-61.5	0.3	1	Rem.	1	0.6		0.3-1.3	0.6-1.8	0.5			0.3
CuZn40Al1	57.5-5.60	0.4	0.8	Rem.	1	1		0.4-1.3	0.8-1.8	0.7			0.5
CuZn40Mn1Pb1(CW720R)	57-59	0.3	1-2	Rem.	0.3	0.6		0.2	0.5-1.5	0.1			0.3
CuZn40Mn1Pb1AlFeSn(CW721R)	57-59	0.2-1	0.8-1.6	Rem.	0.2-1.2	0.3		0.3-1.3	0.8-1.8				0.3
CuZn40Mn1Pb1AlFeSn(CW722R)	56.5-58.5	0.2-1	0.8-1.6	Rem.	0.2-1.2	0.3		0.1	0.81.8				0.3
CuZn40Mn2	57-59	0.5		Rem.	1.5	1		0.1	1-2.5	0.1			0.5
CuZn40Mn2Fe1(CW723R)	56.5-58.5	0.3	0.5	Rem.	0.5-1.5	0.6		0.1	1-2	0.1			0.4
G-CuZn40Fe	56-62	0.1		Rem.	0.2-1.2	2			2.5				1.2
Silicon Brass													
CuZn31Si1	66-70		0.8	Rem.	0.4	0.5				0.7-1.3			0.5
CuZn31Si1(CW708R)	66-70		0.8	Rem.	0.4	0.5				0.7-1.3			0.5
CuZn37Mn3Al2PbSi(CW713R)	57-59	0.4	0.2-0.8	Rem.	1	1		1.3-2.3	1.5-3	0.3-1.3			0.3
CuZn39Mn1AlPbSi(CW718R)	57-59	0.5	0.2-0.8	Rem.	0.5	0.5		0.3-1.3	0.8-1.8	0.2-0.8			0.3
CuZn40Al2	56.5-59	0.5	0.8	Rem.	1	2		1.3-2.3	1.4-2.6	0.3-1			0.5
G-CuZn15Si4	78-83			Rem.	0.6	1				3.8-5			1.2
Cu Ni and Zinc Cu Ni													
CuNi44Mn1	Rem.		0.01		0.2	43-45			0.5-2			0.02	0.1
CuNi10Fe1Mn(CW352H)	Rem.	0.03	0.02	0.5	1-2	9-11	0.02		0.5-1			0.05	0.2
CuNi10Zn27(CW401J)	61-64		0.05	Rem.	0.3	9-11			0.5				0.2
CuNi10Zn42Pb2(CW402J)	45-58	0.2	1-2.5	Rem.	0.3	9-11			0.5				0.2
CuNi12Zn24(CW403J)	63-66	0.03	0.03	Rem.	0.3	11-13			0.5				0.2
CuNi12Zn25Pb1(CW404J)	60-63	0.2	0.5-1.5	Rem.	0.3	11-13			0.5				0.2
CuNi12Zn29(CW405J)	57-60	0.03	0.03	Rem.	0.3	11-13			0.5				0.2
CuNi12Zn30Pb1(CW406J)	56-58	0.2	0.5-1.5	Rem.	0.3	11-13			0.5				0.2
CuNi12Zn38Mn5Pb2(CW407J)	42-45	0.2	1-2.5	Rem.	0.3	11-13			4.5-6				0.2
CuNi18Zn19Pb1(CW408J)	59.5-62.5	0.2	0.5-1.5	Rem.	0.3	17-19			0.7				0.2
CuNi18Zn20(CW409J)	60-63	0.03	0.03	Rem.	0.3	17-19			0.5				0.2
CuNi18Zn27(CW410J)	53-56	0.03	0.03	Rem.	0.3	17-19			0.5				0.2
CuNi25(CW350H)	Rem.	0.03	0.02	0.5	0.3	24-26			0.5			0.05	0.1
CuNi30Fe2Mn2(CW353H)	Rem.	0.05	0.02	0.5	1.5-2.5	29-32	0.02		1.5-2.5			0.05	0.2
CuNi30Mn1Fe(CW354H)	Rem.	0.05	0.02	0.5	0.4-1	30-32	0.02		0.5-1.5			0.05	0.2
CuNi7Zn39Pb3Mn2(CW400J)	47-50	0.2	2.3-3.3	Rem.	0.3	6-8			1.5-3				0.2
CuNi9Sn2(CW351H)	Rem.	1.8-2.8	0.03	0.1	0.3	8.5-10.5			0.3				0.1

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Aluminium Bronze													
C60800	Rem.		0.1		0.1			5-6.5					0.2
C61000	Rem.		0.02	0.2	0.5			6-8.5		0.1			0.2
C61300	Rem.	0.2-0.5	0.01	0.1	2-3	0.15	0.015	6-7.5	0.2	0.1			0.2
C61400	Rem.		0.01	0.2	1.5-3.5		0.015	6-8	1				
C61500	Rem.		0.015			1.8-2.2		7.7-8.3					0.2
C61550	Rem.	0.05	0.05		0.2	1.5-2.5		5.5-6.5	1				0.3
C61800	Rem.		0.02	0.02	0.5-1.5			8.5-11		0.1			0.3
C61900	Rem.	0.6	0.02	0.8	3-4.5			8.5-10					0.3
C62200	Rem.		0.02	0.02	3-4.2			11-12		0.1			0.2
C62300	Rem.	0.6			2-4	1		8.5-10	0.5	0.25			0.2
C62400	Rem.	0.2			2-4.5			10-11.5	0.3	0.25			0.3
C62500	Rem..				3.5-5.5			12.5-13.5	2				0.3
C62580	Rem.		0.02	0.02	3-5			12-13		0.04			0.2
C62581	Rem.		0.02	0.02	3-5			13-14		0.04			0.3
C62582	Rem.		0.02	0.2	3-5			14-15		0.04			0.3
C63000	Rem.	0.2		0.3	2-4	4-5.5		9-11	1.5	0.25			0.3
C63010	78 Min	0.2		0.3	2-3.5	4.5-5.5		9.7-10.9	1.5				1
C63020	74.5 Min	0.25	0.03	0.3	4-5.5	4.2-6		10-11	1.5				0.8
C63200	Rem.		0.02		3.5-4.3	4-4.8		8.7-9.5	1.2-2	0.1			0.8
C63280	Rem.		0.02		3-5	4-5.5		8.5-9.5	0.6-3.5				0.8
C63380	Rem.		0.02	0.15	2-4	1.5-3		7-8.5	11-14	0.1			0.8
C95200	86 Min				2.5-4			8.5-9.5					
C95210	86 Min	0.1	0.05	0.5	2.5-4	1		8.5-9.5	1	0.25			
C95220	Rem.				2.5-4	2.5		9.5-10.5	0.5				
C95300	86 Min				0.8-1.5			9-11					
C95400	83 Min				3-5	1.5		10-11.5	0.5				
C95410	83 Min				3-5	1.5-2.5		10-11.5	0.5				
C95420	83.5 Min				2-4.5	0.5		10.5-12	0.5				
C95500	78 Min				3-5	3-5.5		10-11.5	3.5				
C95510	78 Min	0.2		0.3	2-3.5	4.5-5.5		9.7-10.9	1.5				
C95520	74.5 Min	0.25	0.03	0.3	4-5.5	4.2-6		10.5-11.5	1.5	0.15			
C95700	71 Min				2-4	1.5-3		7-8.5	11-14	0.1			
C95710	71 Min	1	0.05	0.5	2-4	1.5-3		7-8.5	11-14	0.15			
C95720	73 Min	0.1	0.03	0.1	1.5-3.5	3-6		6-8	12-15	0.1			
C95800	78 Min		0.03		3.5-4.5	4-5		8.5-9.5	0.8-1.5	0.1			
C95810	79 Min		0.1	0.5	3.5-4.5	4-5		8.5-9.5	0.8-1.5	0.1			
C95820	77.5 Min	0.2	0.02	0.2	4-5	4.5-5.8		9-10	1.5	0.1			
C95900	Rem.				3-5	0.5		12-13.5	1.5				
Tin Bronze													
C89320	87-91	5-7	0.09	1	0.2	1	0.3	0.005		0.005	0.35	0.08	4-6
C40820	94 Min	1-2.5	0.02	0.2-2.5		0.1-0.5	0.05						
C50100	Rem.	0.5-0.8	0.05		0.05		0.01-0.05						

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Tin Bronze													
C50200	Rem.	1-1.5	0.05		0.1		0.04						
C50500	Rem.	1-1.7	0.05	0.3	0.1		0.03-0.35						
C50510	Rem.	1-1.5		0.1-0.25		0.15-0.4	0.02-0.07						
C50580	Rem.	1-1.7	0.05	0.3	0.05-0.2	0.05-0.2	0.01-0.35						
C50590	Rem.	0.5-1.5	0.02	0.5	0.05-0.4		0.02-0.15						
C50700	Rem.	1.5-2	0.05		0.1		0.3						
C50705	Rem.	1.5-2	0.02	0.5	0.1-0.4		0.04-0.15						
C50710	Rem.	1.7-2.3				0.1-0.4	0.15						
C50715	Rem.	1.7-2.3	0.02		0.05-0.15		0.025-0.04						
C50725	Rem.	1.5-2.5	0.02	1.5-3	0.05-0.2		0.02-0.06						
C50780	Rem.	1.7-2.3	0.05	0.3	0.05-0.2	0.05-0.2	0.01-0.35						
C50900	Rem.	2.5-3.8	0.05	0.3	0.1		0.03-0.3						
C51000	Rem.	4.2-5.8	0.05	0.3	0.1		0.03-0.35						
C51080	Rem.	4.8-5.8	0.05	0.3	0.05-0.2	0.05-0.2	0.01-0.35						
C51100	Rem.	3.5-4.9	0.05	0.3	0.1		0.03-0.35						
C51180	Rem.	3.5-4.9	0.05	0.3	0.05-0.2	0.05-0.2	0.01-0.35						
C51190	Rem.	3-6.5	0.02		0.05-0.15		0.025-0.045						
C51800	Rem.	4-6	0.02				0.10-0.35	0.01					
C51900	Rem.	5-7	0.05	0.3	0.1		0.3-0.35						
C51980	Rem.	5.5-7	0.05	0.3	0.05-0.2	0.05-0.2	0.01-0.35						
C52100	Rem.	7-9	0.05	0.2	0.1		0.03-0.35						
C52180	Rem.	7-9	0.05	0.3	0.05-0.2	0.05-0.2	0.01-0.35						
C52400	Rem.	9-11	0.05	0.2	0.1		0.03-0.35						
C52480	Rem.	9-11	0.05	0.3	0.05-0.2	0.05-0.2	0.1-0.35						
C53400	Rem.	3.5-5.8	0.8-1.2	0.3	0.1		0.03-0.35						
C53800	Rem.	13.1-13.9	0.4-0.6	0.1	0.03	0.03			0.06				
C89325	84-88	9-11	0.1	1	0.15	1	0.1	0.005		0.005	0.5	0.08	2.7-3.7
C89510	86-88	4-6	0.25	4-6	0.2	1	0.05	0.005		0.005	0.25	0.08	0.5-1.5
C89520	85-87	5-6	0.25	4-6	0.2	1	0.05	0.005		0.005	0.25	0.08	1.6-2.2
C89530	84-89	3.5-6	0.2	7-9	0.3	1	0.05	0.01		0.01	0.2		1-2
C89831	87-91	2.7-3.7	0.1	2-4	0.3	1	0.05	0.005		0.005	0.25	0.08	2.7-3.7
C89833	87-91	4-6	0.1	2-4	0.3	1	0.05	0.005		0.005	0.25	0.08	1.7-2.7
C89835	85-89	6-7.5	0.1	2-4	0.2	1	0.1	0.005		0.005	0.35	0.08	1.7-2.7
C89836	87-91	4-7	0.25	2-4	0.35	0.9	0.06	0.005		0.005	0.25	0.08	1.5-3.5
C89837	84-88	3-4	0.1	6-10	0.3	1	0.05	0.005		0.005	0.25	0.08	0.7-1.2
C89844	83-86	3-4	0.2	7-10	0.3	1	0.05	0.005		0.005	0.25	0.08	2-4
C89940	64-68	3-5	0.01	3-5	0.7-2	20-23	0.1-0.15	0.005		0.15	0.2	0.5	4-5.5
C90300	86-89	7.5-9	0.3	3-5	0.2	1	0.05	0.005		0.005	0.2	0.5	
C90200	91-94	6-8	0.3	0.5	0.2	0.5	0.05	0.005		0.005	0.2	0.5	
C90500	86-89	9-11	0.3	1-3	0.2	1	0.05	0.005		0.005	0.2	0.5	
C90700	88-90	10-12	0.5	0.5	0.15	0.5	0.3	0.005		0.005	0.2	0.5	
C90710	Rem.	10-12	0.25	0.05	0.1	0.1	0.05-1.2	0.005		0.005	0.2	0.5	

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Tin Bronze													
C90800	85-89	11-13	0.25	0.25	0.15	0.5	0.3	0.005		0.005	0.2	0.05	
C90810	Rem.	11-13	0.25	0.3	0.15	0.5	0.15-0.8	0.005		0.005	0.2	0.05	
C90900	86-89	12-14	0.25	0.25	0.15	0.5	0.05	0.005		0.005	0.2	0.05	
C91000	84-86	14-16	0.2	1.5	0.1	0.8	0.05	0.005		0.005	0.2	0.05	
C91100	82-85	15-17	0.25	0.25	0.25	0.5	1	0.005		0.005	0.2	0.05	
C91300	79-82	18-20	0.25	0.25	0.25	0.5	1	0.005		0.005	0.2	0.05	
C91600	86-89	9.7-10.3	0.25	0.25	0.2	1.2-2	0.3	0.005		0.005	0.2	0.05	
C91700	84-87	11.3-12.5	0.25	0.25	0.2	1.2-2	0.3	0.005		0.005	0.2	0.05	
C92200	86-90	5.5-6.5	1-2	3-5	0.25	1	0.05	0.005		0.005	0.25	0.05	
C92300	85-89	7.5-9	0.3-1	2.5-5	0.25	1	0.05	0.005		0.005	0.25	0.05	
C92310	Rem.	7.5-8.5	0.3-1.5	3.5-4.5		1		0.005	0.03	0.005			
C92400	86-89	9-11	1-2.5	1-3	0.25	1	0.05	0.005		0.005	0.25	0.05	
C92500	85-88	10-12	1-1.5	0.5	0.3	0.8-1.5	0.3	0.005		0.005	0.25	0.05	
C92600	86-88.5	9.3-10.5	0.8-1.5	1.3-2.5	0.2	0.7	0.03	0.005		0.005	0.25	0.05	
C92610	Rem.	9.3-10.5	0.3-1.5	1.7-2.8	0.15	1		0.005	0.03	0.005			
C92700	86-89	9-11	1-2.5	0.7	0.2	1	0.25	0.005		0.005	0.25	0.05	
C92710	Rem.	9-11	4-6	1	0.2	2	0.1	0.005		0.005	0.25	0.05	
C92800	78-82	15-17	4-6	0.8	0.2	0.8	0.05	0.005		0.005	0.25	0.05	
C92810	78-82	12-14	4-6	0.5	0.5	0.8-1.2	0.05	0.005		0.005	0.25	0.05	
C92900	82-86	9-11	2-3.2	0.25	0.2	2.8-4	0.5	0.005		0.005	0.25	0.05	
C93100	Rem.	6.5-8.5	2-5	2	0.25	1	0.3	0.005		0.005	0.25	0.05	
C93200	81-85	6.3-7.5	6-8	1-4	0.2	1	0.15	0.005		0.005	0.35	0.08	
Gun Metal													
C83300	92-94	1-2	1-2	2-6									
C83450	87-89	2.2-3	1.5-2.5	5.5-7.5	0.25	0.8-1.5	0.03	0.005		0.005	0.25	0.08	
C83500	86-88	5.5-6.5	3.5-5.5	1-2.5	0.25	0.5-1	0.03	0.005		0.005	0.25	0.08	
C83600	84-86	4.3-6	4-5.7	4.3-6	0.25	1	0.05	0.005		0.005	0.25	0.08	
C83800	82-83.5	3.5-4.2	5.8-6.8	5.5-8	0.25	1	0.03	0.005		0.005	0.25	0.08	
C83810	Rem.	2-3.5	4-6	7.5-9.5	0.5	2		0.005		0.1			
C84200	78-82	4-6	2-3	10-16	0.4	0.8	0.5	0.005		0.005	0.25	0.08	
C84400	79-82	2.5-3.5	6-8	7-10	0.4	0.8	0.2	0.005		0.005	0.25	0.08	
C84410	Rem.	3-4.5	7-9	7-11		1		0.01		0.02			0.05
C84500	77-79	2-4	6-7.5	10-14	0.4	1	0.02	0.005		0.005	0.25	0.08	
C84800	75-76.7	2-3	5.5-7	13-17	0.4	1	0.02	0.005		0.005	0.25	0.08	
C92210	86-89	4.5-5.5	1.7-2.5	3-4.5	0.25	0.7-1	0.03	0.005		0.005	0.2	0.05	
C92220	86-88	5-6	1.5-2.5	3-5.5	0.25	0.5-1	0.05						
C54400	Rem.	3.5-4.5	3.5-4.5	1.5-4.5	0.1		0.01-0.5						
Leaded Bronze													
C92410	Rem.	6-8	2.5-3.5	1.5-3	0.2	0.2		0.005	0.005	0.005	0.25		
C93400	82-85	7-9	7-9	0.8	0.2	1	0.5	0.005		0.005	0.5	0.08	
C93500	83-86	4.3-6	8-10	2	0.2	1	0.05	0.005		0.005	0.3	0.08	
C93600	79-83	6-8	11-13	1	0.2	1	0.15	0.005		0.005	0.55	0.08	

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Leaded Bronze													
C93700	78-82	9-11	8-11	0.8	0.7	0.5	0.1	0.005		0.005	0.5	0.08	
C93720	83-Min	3.5-4.5	7-9	4	0.7	0.5	0.1				0.5		
C93800	75-79	6.3-7.5	13-16	0.8	0.15	1	0.05	0.005		0.005	0.8	0.08	
C93900	76.5-79.5	5-7	14-18	1.5	0.4	0.8	0.15	0.005		0.005	0.5	0.08	
C94000	69-72	12-14	14-16	0.5	0.25	0.50-1	0.05	0.005		0.005	0.5	0.08	
C94100	72-79	4.5-6.5	18-22	1	0.25	1	0.5	0.005		0.005	0.8	0.08	
C94300	67-72	4.5-6	23-27	0.8	0.15	1	0.08	0.005		0.005	0.8	0.08	
C94310	Rem.	1.5-3	27-34	0.5	0.5	0.25-1	0.05				0.5		
C94320	Rem.	4-7	24-32		0.35								
C94330	68.5-75.5	3-4	21-25	3	0.7	0.5	0.1				0.5		
C94400	Rem.	7-9	9-12	0.8	0.15	1	0.5	0.005		0.005	0.8	0.08	
C94500	Rem.	6-8	16-22	1.2	0.25	1	0.05	0.005		0.005	0.8	0.08	
C98200	Rem.	0.6-2	21-27	0.5	0.7	0.5	0.1				0.5		
C98400	Rem.	0.5	26-33	0.5	0.7	0.5	0.1				0.5		
C98600	60-70	0.5	30-40		0.35				0.03				
C98800	56.5-62.5	0.25	37.5-42.5	0.1	0.35		0.02						
C98820	Rem.	1-5	40-44		0.35								
C98840	Rem.	1-5	44-58		0.35								
Brass													
C21000	94-96	Rem.	0.05										
C22000	89-91	Rem.	0.05							0.005	0.25	0.08	
C22600	86-89	Rem.	0.05							0.005	0.25	0.08	
C23000	84-86	Rem.	0.05							0.005	0.25	0.08	
C23400	81-84	Rem.	0.05							0.005	0.25	0.08	
C24000	78.5-81.5	Rem.	0.05							0.1			
C24080	78-82	Rem.			0.1					0.005	0.25	0.08	
C25600	71-73	Rem.	0.05							0.005	0.25	0.08	
C26000	68.5-71.5	Rem.	0.05							0.02			0.05
C26130	68.5-71.5	Rem.	0.05							0.005	0.25	0.08	
C26200	67-70	Rem.	0.05							0.005	0.25	0.08	
C26800	64-68.5	Rem.	0.05							0.005	0.2	0.05	
C27000	63-68.5	Rem.	0.07										
C27200	62-65	Rem.	0.07										
C27400	61-64	Rem.	0.05										
C28000	59-63	Rem.	0.07										
C31200	87.5-90.5	Rem.	0.1	0.25									
C31400	87.5-90.5	Rem.	0.1	0.7									
C31600	87.5-90.5	Rem.	0.1	0.7-1.2	0.04-0.1								
C32000	83.5-86.5	Rem.	0.1	0.25									
C33000	65-68	Rem.	0.07										
C33200	65-68	Rem.	0.07										
C33500	62-65	Rem.	0.15										

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Brass													
C34000	62-65		0.8-1.5	Rem.	0.15								
C34200	62-65		1.5-2.5	Rem.	0.15								
C34500	62-65		1.5-2.5	Rem.	0.15								
C35000	60-63		0.8-2	Rem.	0.15								
C35300	60-63		1.5-2.5	Rem.	0.15								
C35330	59-64		1.5-3.5	Rem.									
C35600	60-63		2-3	Rem.	0.15								
C36000	60-63		2.5-3.7	Rem.	0.35								
C36500	58-61	0.25	0.25-0.7	Rem.	0.15								
C37000	59-62		0.8-1.5	Rem.	0.15								
C37100	58-62		0.6-1.2	Rem.	0.15								
C37700	58-61		1.5-2.5	Rem.	0.3								
C37710	56.5-60		1-3	Rem.	0.3								
C38000	55-60	0.3	1.5-2.5	Rem.	0.35			0.5					
C38500	55-59		2.5-3.5	Rem.	0.35								
C40400	Rem.	0.35-0.7		2-3									
C40500	94-96	0.7-1.3	0.05	Rem.	0.05								
C40810	94.5-96.5	1.8-2.2	0.05	Rem.	0.08-0.12	0.11-0.2	0.028-0.4						
C40850	94.5-96.5	2.6-4	0.05	Rem.	0.05-0.2	0.05-0.2	0.01-0.2						
C40860	94-96	1.7-2.3	0.05	Rem.	0.01-0.05	0.05-0.2	0.02-0.04						
C41000	91-93	2-2.8	0.05	Rem.	0.05								
C41100	89-92	0.3-0.7	0.1	Rem.	0.05								
C41120	89-92	0.3-0.7	0.05	Rem.	0.05-0.2	0.05-0.2	0.01-0.35						
C41300	89-93	0.7-1.3	0.1	Rem.	0.05								
C41500	89-93	1.5-2.2	0.1	Rem.	0.05								
C42000	88-91	1.5-2		Rem.			0.25						
C42200	86-89	0.8-1.4	0.05	Rem.	0.05		0.35						
C42220	88-91	0.7-1.4	0.05	Rem.	0.05-0.2	0.05-0.2	0.02-0.05						
C42500	87-90	1.5-3	0.05	Rem.	0.05		0.35						
C42520	88-91	1.5-3	0.05	Rem.	0.05-0.2	0.05-0.2	0.01-0.2						
C42600	87-90	2.5-4	0.05	Rem.	0.05-0.2	0.05-0.2	0.01-0.2						
C43000	84-87	1.7-2.7	0.1	Rem.	0.05								
C43400	84-87	0.4-1	0.05	Rem.	0.05								
C43500	79-83	0.6-1.2	0.1	Rem.	0.05								
C43600	80-83	0.2-0.5	0.05	Rem.	0.05								
C44250	73-76	0.5-1.5	0.07	Rem.	0.2	0.2	0.1						
C44300	70-73	0.8-1.2	0.07	Rem.	0.06								
C44400	70-73	0.8-1.2	0.07	Rem.	0.06						0.02-0.1		
C44500	70-73	0.8-1.2	0.07	Rem.	0.06		0.02-0.1						
C46200	62-65	0.5-1	0.2	Rem.	0.1								
C46400	59-62	0.5-1	0.2	Rem.	0.1								
C46500	59-62	0.5-1	0.2	Rem.	0.1								

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Brass													
C47000	57-61	0.25-1	0.05	Rem.				0.01					
C47940	63-66	1.2-2	1-2	Rem.	0.1-1	0.1-0.5							
C48200	59-62	0.5-1	0.4-1	Rem.	0.1								
C48500	59-62	0.5-1	1.3-2.2	Rem.	0.1								
C48600	59-62	0.3-1.5	1-2.5	Rem.									
C66200	86.6-91	0.2-0.7	0.05	Rem.	0.05	0.30-1	0.05-0.2						
C66300	84.5-87.5	1.5-3	0.05	Rem.	1.4-2.4		0.35						
C66400	Rem.	0.05	0.015	11-12	1.3-1.7								
C66410	Rem.	0.05	0.015	11-12	1.8-2.3								
C66420	Rem.			12.7-17	0.5-1.5								
C66430	Rem.	0.6-0.9	0.05	13-15	0.6-0.9		0.1						
C67500	57-60	0.5-1.5	0.2	Rem.	0.8-2			0.25	0.05-0.5				
C67600	57-60	0.5-1.5	0.5-1	Rem.	0.4-1.3				0.05-0.5				
C68000	56-60	0.75-1.1	0.05	Rem.	0.25-1.25	0.2-0.8		0.01	0.01-0.5	0.04-0.15			
C68100	56-60	0.75-1.1	0.05	Rem.	0.25-1.2			0.01	0.01-0.5	0.04-0.15			
C68700	76-79		0.07	Rem.	0.06			1.8-2.5					
C68800	Rem.		0.05	21.3-24.1	0.2			3-3.8			0.25	0.08	
C83400	88-92	0.2	0.5	8-12	0.25	1	0.03	0.005		0.005	0.2	0.05	
C85200	74-74	0.7-2	1.5-3.58	20-27	0.6	1	0.02	0.005		0.05			
C85400	65-70	0.5-1.5	1.5-3.8	24-32	0.7	1		0.35		0.05			
C85500	59-63	0.2	0.2	Rem.	0.2	0.2			0.2				
C85700	58-64	0.5-1.5	0.8-1.5	32-40	0.7	1		0.8		0.05			
C85710	58-63	1	1-2.5	32-39	0.8	1		0.2-0.8	0.5	0.05			
C85800	57 Min	1.5	1.5	31-41	0.5	0.5	0.01	0.55	0.25	0.25	0.05	0.05	
C89540	58-64	1.2	0.1	32-38	0.5	1		0.1-0.6					0.6-1.2
C89550	58-64	1.2	0.1	32-38	0.5	1	0.01	0.1-0.6		0.25	0.05	0.05	0.6-1.2
High Tensile Brass													
C66700	68.5-71.5		0.07	Rem.	0.1				0.8-1.5				
C66800	60-63	0.3	0.5	Rem.	0.35	0.25		0.25	2-3.5	0.5-1.5			
C66900	62.5-64.5		0.05	Rem.	0.25				11.5-12.5				
C66950	Rem.		0.1	14-15	0.5			1-5.5	14-15				
C67000	63-68	0.5	0.2	Rem.	2-4			3-6	2.5-5				
C67300	58-63	0.3	0.4-3	Rem.	0.5	0.25		0.25	2-3.5	0.5-1.5			
C67400	57-60	0.3	0.5	Rem.	0.35	0.25		0.5-2	2-3.5	0.5-1.5			
C67420	57-58.5	0.35	0.25-0.8	Rem.	0.15-0.55	0.25		1-2	1.5-2.5	0.25-0.7			
C86100	66-88	0.2	0.2	Rem.	2-4			4.5-5.5	2.5-5				
C86200	60-66	0.2	0.2	22-28	2-4			3-4.9	2.5-5				
C86300	60-66	0.2	0.2	22-28	2-4	1		5-7.5	2.5-5				
C86400	56-62	0.5-1.5	0.5-1.5	34-42	0.4-2	1		0.5-1.5	0.1-1.5				
C86500	55-60	1	0.4	36-42	0.4-2	1		0.5-1.5	0.1-1.5				
C86550	57 Min.	1	0.5	Rem.	0.7-2	1		0.5-2.5	0.1-3	0.1			

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
High Tensile Brass													
C86700	55-60	1.5	0.5-1.5	30-38	1-3	1		1-3	0.1-3.5				
C86800	53.5-57	1	0.2	Rem.	1-2.5	2.5-4		2	2.5-4				
C99700	54 Min	1	0.2	19-25	1	4-6		0.5-3	11-15				
C99750	55-61		0.5-2.5	17-23	1	5		0.25-3	17-23				
Silicon Brass													
C23030	83.5-85.5		0.05	Rem.	0.05					0.2-0.4			
C69050	70-75			Rem.		0.5-1.5		3-4		0.1-0.6			
C69100	81-84	0.1	0.05	Rem.	0.25	0.8-1.4	0.04-0.15	0.7-1.2	0.1	0.8-1.3			
C69300	73-77	0.2	0.1	Rem.	0.1	0.1			0.1	2.7-3.4			
C69400	80-83		0.3	Rem.	0.2					3.5-4.5			
C69430	80-83		0.3	Rem.	0.2					3.5-4.5			
C69700	75-80		0.5-1.5	Rem.	0.2				0.4	2.5-3.5			
C69710	75-80		0.5-1.5	Rem.	0.2				0.4	2.5-3.5			
C69750	78-83	0.05	0.8-1.3	Rem.	0.05	0.01	0.02		0.05	1.9-2.22			
C87400	79 Min		1	12-16				0.8		2.5-4			
C87500	79 Min		0.5	12-16				0.5		3-5			
C87600	88 Min		0.5	4-7	0.2				0.25	3.5-5.5			
C87610	90 Min		0.2	3-5	0.2				0.25	3-5			
C87800	80 Min	0.25	0.15	12-16	0.15	0.2	0.01	0.15	0.15	3.8-4.2	0.05	0.05	
C87850	74-78	0.3	0.1	Rem.	0.1	0.2	0.05-0.2		0.1	2.7-3.4	0.1		
Silicon Brass													
C63400	Rem.	0.2	0.05	0.5	0.15	0.15		2.6-3.2		0.25-0.45			
C63600	Rem.	0.2	0.05	0.5	0.15	0.15		3-4		0.7-1.3			
C63800	Rem.		0.05	0.8	0.2	0.2		2.5-3.1	0.1	1.5-2.1			
C64200	Rem.		0.05	0.5	0.3	0.25		6.3-7.6	0.1	1.5-2.2			
C64210	Rem.	0.2	0.05	0.5	0.3	0.25		6.3-7	0.1	1.5-2			
C87300	94 Min	0.2	0.2	0.25	0.2				0.8-1.5	3.5-4.5			
C95600	88 Min					0.25		6-8		1.8-3.2			
Cu Ni Bronze													
C94700	85-90	4.5-6	0.1	1-2.5	0.25	4.5-6	0.05	0.005	0.2	0.005	0.15	0.05	
C94800	84-89	4.5-6	0.3-1	1-2.5	0.3	4.5-6	0.05	0.005	0.2	0.005	0.15	0.05	
C94900	79-81	4-6	4-6	4-6	0.25	4-6	0.05	0.005	0.1	0.005	0.15	0.08	
C96200	Rem.		0.01		1-1.8	9-11	0.02		1.5	0.5			
C96300	Rem.		0.01		0.5-1.5	18-22	0.02		0.25-1.5	0.5			
C96400	Rem.		0.01		0.25-1.5	28-32	0.02		1.5	0.5			
C96600	Rem.		0.01		0.8-1.1	29-33			1	0.15			
C96700	Rem.		0.01		0.4-1	29-33			0.4-1	0.15			
C96800	Rem.	7.5-8.5	0.005	1	0.5	9.5-10.5			0.05-0.3	0.05			
C96900	Rem.	7.5-8.5	0.02	0.5	0.5	14.5-15.5			0.05-0.3				
C96950	Rem.	5.8-8.5	0.02		0.05	11-15.5			0.05-0.4	0.3			

USA ASTM

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Cu Ni Bronze													
C96970	Rem.	5.5-6.5	0.02	0.5	0.5	8.5-9.5			0.3				
C97300	53-58	1.5-3	8-11	17-25	1	11-14	0.05	0.005	0.5	0.005	0.35	0.08	
C97600	63-66	3.5-4.5	3.5-5	3-9	1	19.5-21	0.05	0.005	1	0.005	0.25	0.08	
C97800	64-67	4.5-5.5	1-2	1-4	1	24-26	0.05	0.005	1	0.005	0.2	0.08	
C99400	Rem.		0.25	5	5.5	5.5		2		2			
C99500	Rem.		0.25	2	5.5	5.5		2		2			

Italy UNI

	Standards	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	S	BI
Alluminium Bronze														
Cu83Al9Zn4Fe3Ni2	UNI	Rem.	0.3	0.2	2-4	1.5-3.5	1-4		8-9.5	2.5	0.15			0.15
G-CuAl11Fe4	UNI5274	81-87	0.2	0.05	0.2	3-5	2.5		10-11.5	1	0.5			0.4
G-CuAl11Fe4Ni4	UNI5275	78-84	0.1	0.05	0.1	3-5	3-5.5		10-11.5	3.5	0.5			0.2
G-CuAl9Fe3	UNI5273	83-89	0.2	0.05	0.2	2.5-4	1.5		8.5-9.5	1.5	0.5			0.4
Tin Bronze														
B10	UNI1698	88-92	8-12	1		0.3	0.5	0.05				0.2		
B14	UNI1698	84-88	12-16	1		0.3	0.5	0.05				0.2		
B20	UNI1698	78-81	18-21	1		0.3	0.5	0.05				0.2		
B Zn 2	UNI1698	92-94	3-5	2	Rem.	0.2	0.1	0.05				0.1		
B Zn 4	UNI1698	85-88	9-11	1	Rem.	0.3	1	0.05				0.3		
B Zn 6	UNI1698	85.5-87.5	7.5-8.5	2.5	Rem.	0.2	0.1	0.05				0.3		
G-CuSn10	UNI7013	Rem.	9-11	0.8	0.5	0.2	0.7	0.05		0.2		0.2	0.1	
G-CuSn10Zn2	UNI7013	Rem.	8.5-11	1.3	1-3	0.2	1	0.05		0.2		0.3	0.1	2
G-CuSn10Zn2Ni2	UNI7013	Rem.	9-11	1	1.5-2.5	0.2	1.8-2.5	0.05		0.2		0.3	0.1	2
G-CuSn12	UNI7013	Rem.	11-13	1	0.5	0.2	0.7	0.05		0.2		0.2	0.1	1.5
Gun Metal														
B Zn 7	UNI1698	83-85	5-7.5	4	Rem.	0.5	1	0.05				0.5		
G-CuSn3Zn10Pb7	UNI7013	Rem.	3-5	5-7.5	9-11	0.4	2	0.05		0.2		0.4	0.2	1.2
G-CuSn5Zn5Pb5	UNI7013	Rem.	4-6	4-6	4-6	0.3	2	0.05		0.1		0.4	0.1	1
G-CuSn7Zn4Pb6	UNI7013	Rem.	6-8	5-7	3-5	0.25	2	0.05		0.1		0.35	0.1	0.7
Leaded Bronze														
B Pb 4	UNI1698	85-87	9-11	2-6	1	0.1	0.2			0.05		0.1		
BsPb 12	UNI1698	79-81	7-9	8-13	0.1	0.2	1			1		0.3		
BsPb 30	UNI1698	64-68	2.5-3.5	28-32	0.1	0.2	1			0.05		0.2		
BsPb 7	UNI1698	78-81	9-11	6-8	0.1	0.3	2.5-3.5			0.05		0.2		
BsPb 8	UNI1698	82-86	6-8	7-9	1	0.3	1			1		0.2		
G-CuSn10Pb10	UNI7013	Rem.	9-11	8.5-10.5	1	0.15	1.5	0.01		0.05		0.5	0.2	1
G-CuSn5Pb20	UNI7013	Rem.	4-6	19-23	1.5	0.15	2	0.01		0.05		0.75	0.2	0.5
G-CuSn8Pb15	UNI7013	Rem.	7-9	13-17	1	0.15	2	0.01		0.05		0.5	0.2	1

Italy UNI

	Standard	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	SB
Brass													
G-CuZn34Pb2	UNI5036	62-65	1	1.5-2.5	Rem.	0.6	1	0.1	0.05	0.5	0.05	0.1	
G-CuZn36	UNI5034	62-65	0.5	0.4	Rem.	0.35	0.5	0.05	0.05	0.4	0.05	0.05	
G-CuZn38Pb2	UNI5035	59.5-62	1.3	1.5-2.5	Rem.	0.6	1	0.05	1	0.7	0.3	0.1	
G-CuZn40	UNI5033	59-61	0.5	0.5	Rem.	0.25	0.5	0.05	0.35	0.3	0.05	0.15	
High Tensile Brass													
G-CuZn38Al1Fe1Mn1	UNI6138-68	58-61	0.3	0.2	Rem.	0.5-1.5	2.5	0.05	0.5-1.5	0.5-2.5	0.1	0.05	0.05
G-CuZn39Al2Fe1Mn2	UNI6138-68A	54-58	0.1	0.05	Rem.	0.5-2	0.5	0.05	1-3	1-4.5	0.1	0.05	0.05
G-CuZn39Al2Mn2Fe1	UNI6139	54-58	0.1	0.05	Rem.	0.5-2	0.5	0.05	1-3	1-4.5	0.1	0.05	
Silicon Brass													
G-CuZn36Si1Pb1	UNI5038	61-63	0.5	0.5-1.2	Rem.	0.3	0.5	0.05	0.25	0.15	0.8-1.2	0.1	
G-CuZn39Si1	UNI5037	59-61	0.2	0.15	Rem.	0.15	0.2	0.05	0.2	0.15	0.8-1.1	0.05	

Symbols & Melting Points

	CU	SN	PB	ZN	FE	NI	P	AL	MN	SI	SB	SB	Impurities
Aluminium Bronze 709													
CuAl10 Fe3	Rem.	0.2	0.05	0.5	2-4	1.5		8.5-11	3	0.2			0.8
CuAl10Fe5Ni5	Rem.	0.2	0.05	0.5	3-5.5	4-6.5		8.5-11	1.5	0.1			0.8
CuAl12Fe5Ni5	Rem.	0.2	0.05	0.5	3-6	4-6		10.5-12	1.5	0.2			0.8
CuAl9	Rem.				1.2	1		8.5-10.5	0.5				0.5
CuAl9Ni3Fe2	Rem.	0.2	0.05	0.5	1-3	1.5-4		8.5-10.5	1.5	0.2			0.8
Tin Bronze 707													
CuSn12	Rem.	10.5-13	2.5	2	0.25	2	0.3	0.01		0.01		0.05	0.5
CuSn12P	Rem.	11-13	1	1	0.2	2	0.05-0.4	0.01		0.01		0.05	1.2
CuSn14	83.5 Min	12.5 Min		1									1.5
CuSn8	Rem.	7-9	0.5-3	3	0.2	1.5		0.01		0.01		0.1	1
Gun Metal 707													
CuSn3Zn9Pb7	Rem.	2-3.5	6-8	7-10	0.3	1.5		0.01		0.01		0.1	1
CuSn5Pb5Zn5	Rem.	4-6	4-6	4-6	0.3	1.5		0.01		0.01		0.1	1
CuSn7Pb6Zn4	Rem.	6-8	5-7	2-5	0.2	1.5		0.01		0.01		0.1	1
Leaded Bronze													
CuPb20Sn5	Rem.	4-6	18-23	2	0.25	2.5		0.01		0.01			1
CuSn10Pb10	Rem.	9-11	8-11	2	0.25	2	0.3	0.01		0.01			1
Brass 703													
CuZn33Pb Y20	65-70	0.8	1.8	Rem.	0.5	0.5	0.05	0.1	0.2	0.05			
CuZn40 Y30	59-63	0.7	0.5-2	Rem.	0.5	0.8		0.2-0.8	0.5	0.05			
CuZn40 Y40	59-63	0.7	0.5-2	Rem.	0.5	0.8		0.2	0.5	0.2			
High Tensile Brass 703													
CuZn19Al6 Y20	60-66	0.1	0.1	18-25	2-3	1		5-7.5	2.5-4				
CuZn23Al4 Y20	60-66	0.2	0.2	20-27	1.5-3	2.5		3-5	2.5-4.5				
CuZn30AlFeMn Y40	59-67	0.3	1.5	Rem.	0.5-2	2.5		1-2.5	1-3.5	1			

Phosphor Copper

		P	CU	P+CU Min	FE	NI	PB	SN	ZN	SB	MN	AL	SI
GERMANY-DIN 17657													
V - CuP10	(2.1631)	9.5-11	89 Min		0.15	0.2	0.2	0.2	0.2				
VR - CuP10	(2.1633)	9.5-11	89 Min		0.05	0.1	0.03	0.05	0.05	0.01			
DIN 8513													
L-CuP8	(2.1465)	7.6-8.4	Rem.				0.02					0.01	
L-CuP7	(2.1463)	6.7-7.5	Rem.				0.02					0.01	
L-CuP6	(2.1462)	5.9-6.5	Rem.				0.02					0.01	
JAPAN-JIS H2501													
1A 15 P Cu A		14.5 Min	Rem.	99.75	0.05		0.01	0.01					
1A 15 P Cu B		14 Min	Rem.	99.75	0.15								
2 10 p Cu		10-11	Rem.	99.75	0.15								
3 8 P Cu		8-9	Rem.	99.75	0.15								
EUROPEAN STANDARD													
CU P 15 A	CM217E	13.5-15	84.5 Min		0.1	0.1	0.03	0.05	0.05	0.01	0.1	0.02	0.05
CU P 15 B	CM218E	13.5-15	84 Min		0.1	0.1	0.1	0.1	0.1				
CU P 15 C	CM219E	13.5-15	83.5 Min		0.2	0.2	0.2	0.2	0.2				
CU P 10 A	CM215E	9.5-11	88.5 Min		0.1	0.1	0.03	0.05	0.05	0.01	0.1	0.02	0.05
CU P 10 B	CM215E	9.5-11	87.5 Min		0.2	0.2	0.2	0.2	0.2				
USA - ASTM B-52													
Alloy A		14 Min	Rem.	99.75	0.15	0.15							
Alloy B		10 Min	Rem.	99.75	0.15	0.15							

Symbols & Melting Points

Element	Symbol	Melting Point °C	Element	Symbol	Melting Point °C	Element	Symbol	Melting Point °C
Aluminium	Al	660.3	Iridium	Ir	660.3	Selenium	Se	217
Antimony	Sb	630.7	Iron	Fe	630.7	Silicon	Si	1448
Arsenic	As	817	Lead	Pb	817	Silver	Ag	960.8
Barium	Ba	725	Lithium	Li	725	Strontium	Sr	769
Beryllium	Be	1278	Magnesium	Mg	1278	Sulphur	S	112.8
Bismuth	Bi	271.2	Manganese	Mn	271.2	Tantalum	Ta	2996
Boron	B	2300	Mercury	Hg	2300	Tellurium	Te	449.5
Cadmium	Cd	320.8	Molybdenum	Mo	320.8	Thallium	Tl	303.5
Calcium	Ca	839	Nickel	Ni	839	Thorium	Th	1750
Carbon	C	3550	Niobium	Nb	3550	Tin	Sn	232
Cerium	Ce	798	Nitrogen	N	798	Titanium	Ti	1660
Chromium	Cr	1857	Oxygen	O	1857	Tungsten	W	3410
Cobalt	Co	1495	Palladium	Pd	1495	Uranium	U	1132
Copper	Cu	1083	Phosphorus	P	1083	Vanadium	V	1890
Gold	Au	1064	Platinum	Pt	1064	Zinc	Zn	419.5
Hafnium	Hf	2227	Radium	Ra	2227	Zirconium	Zr	1852
Hydrogen	H	-259	Rhodium	Rh	-259			
Indium	In	156.6	Rubidium	Rb	156.6			

Physical Properties & Typical Uses

Grade B.S. 1400: 1985	Nominal Composition	2% PS N/mm Min	Tensile Strength N/mm Min	Elongation % Min	Brinell Hardness Min	Physical Properties & Typical Uses
Gun Metal						
G1/BC3	88/10/2		245	15		Pressure tight bearings, bushes and pump fittings, valves, valve bodies and valve guides under corrosive marine condition. Cast components such as actuating nuts, valve, pump and similar components at normal temperatures under corrosive conditions. Hardware fittings, plumbing fixtures Valve bodies, pump bodies, elbows, pipes, taps and cocks and other hydraulic fittings where pressure tight properties are important pump and valve parts, steam valves, oilpumps, bushes of medium strength, Railway bearings, engine components, tractor parts and pressure components
G1/BC2	88/8/4		245	20		
LG 1	88/3/9/5	85	180	15	60	
LG 2	85/5/5/5	90	200	13	60	
LG 3	86/7/5/2					
LG 4	88/7/2/3	130	230	14	65	
BC 1	82/3/10/5		165	15		
BC 2	85/5/5/5		215	18		
PHOSPHOR BRONZE						
PB1	89/10/0/1	130	250	5		Bearing for aero-engines, diesel engine, electrica generators and rollong mills. Gear and worm wheels Pressure vessels, pump bodies constings and impellers for chemical plants similar to PBI-C Bearing and bushes for lighter duties
PB2	88/12	140	260	7		
PB3	90/10	130	250	5		
Pb4	90.5/9.5	130	240	5		
LPB-1	87/8/2/3	80	175	7		
Pbc2	88/12	120	195	5		
Pbc2B	88/12	145	295	5		
LEAD BRONZE						
LPB1	76/9/0/15					Bearing in mining machinery in corrosive water conditions, and for unlined bearings under poor lubrication conditions. Mill bearings, railway bearings and bearings for oil industry. Bushes chill cast, centrifugally cast and continuously cast. Similar applications to LB2-C linings for steel-backed motor and aero-engine bearings for use at higher temperatures than white metal linings.
Lb2	80/10/0/10	80	180	8	60	
LB3/LBC3	85/10/0/5	100	195	10	65	
LB4	85/5/0/10	60	160	7	55	
LB5	75/5/0/20	70	150	5	45	
LBC3	79/10/1/10	80	180	8	60	
LBC4	78/7/0/15	80	170	8	60	
ALUMINIUM BRONZE						
Ab1	89/9/2	180	500	18	100	Propellers, pump impellers, pump an valve parts, bearings, wear rings, marine hardware, pickling hooks and baskets and in the petroleum, oil and chemical industries.
Ab2	85/9/4/5	250	600	13	140	
ALBC2	84/9/4/5		490	20	120	
ALBC3	82/10/4/4	245	590	15	150	
ALUMINIUM BRONZE						
HTB1	58/1/1/1/39	170	450	20	110	Components highly stressed at normal temperatures. Marine casting and fittings, hydraulic equipment. Locomotive axle boxes, pump casting, heavy rolling mill housing nuts spur and gear, wheels which are heavily loaded and slow moving.
HTB2	58/1/2/3/36					
HTB3	58/2/2/4/34	450	750	8	180	
HSBC4		410	755	12	200	
HSBC3		305	635	15	165	
Brass						
SCB1						Valves, cocks, plumbing fittings, hardware and ornamental castings Marine fittings, castings for the electrical trade, brush holders. Pipe fittings, gas fittings, door and furniture switchgear bush holders. Pump bodies, bolts, nuts, and plates for heat exchange equipment and small machine parts. Flanges and plates and fittings for marine applications Similar applications to SCB5-C and for imitation jewellery.
SCB2						
SCB3	65/35	70	180	12	45	
SCB4/YBSC3	60/40	70	250	20	45	
SCB5	90/10					
SCB6	85/15	70	160	20	45	

Classification of Alloys According to Solidification Characteristics

Alloy		Approximate Length of freezing range	Solidification Type
Group A			
Phosphor Bronze	Pb4	100-180°C	L
Leaded Phosphor Bronze	LPB1	100-180°C	L
Leaded Bronzes	LB2	100-180°C	L
	LB4	100-180°C	L
Leaded Gun Metals	LG2	100-180°C	L
	LG4	100-180°C	L
Sand Cast Brasses	SCB1	20-50°C	S
	SCB3	20-50°C	S
	SCB6	20-50°C	S
Die Cast Brasses	DCB1	0-20°C	S
	DCB3	0-20°C	S
	PCB1	0-20°C	S
Group B			
High Conductivity Copper	HCC1	5-15°C	S
Copper Chromium	Cc1	100-180°C	S
Phosphor Bronzes	Pb1	100-180°C	L
	PB2	100-180°C	L
Copper Tin	CT1	100-180°C	L
Leaded Bronze	LB5	100-180°C	L
Leaded Gunmetal	LG1	100-180°C	L
Aluminium Bronze	AB1	5-15°C	S
	AB2	5-15°C	S
CMA Alloys	CMA1	20-50°C	S
	CMA2	20-50°C	S
High Tensile Brasses	HTB1	0-20°C	S
	HTB3	0-20°C	S
Group 3			
Leaded Bronze	LB1	100-180°C	L
Gunmetal	G1	100-180°C	L
Sand Cast Brass	SCB4	20-50°C	S
90/10 Cupro-Nickel	-	40-60°C	-
70/30 Cupro-Nickel	-	60-80°C	L
Beryllium Copper	-	80-100°C	L

Suitability for Casting Pressure Tight Sand Casting

Alloy		Thin Sections	Thick Section
Group A			
Phosphor Bronze	PB4	3	3
Leaded Phosphor Bronze	LPB1	2	2
Leaded Bronzes	LB2	2	2
	LB4	2	2
Leaded Gun Metals	LG2	1	2
Sand Cast Brasses	SCB1	1	1
	SCB2	1	1
	SCB6	1	1
Group B			
High Conductivity Copper	HCC1	1	1
Copper Chromium	CC1	2	2
Phosphor Bronzes	PB1	3	3
	PB2	3	3
Copper Tin	CT1	2	3
Leaded Bronze	LB5	2	3
Leaded Gunmetal	LG1	1	2
Aluminium Bronze	AB1	1	1
	AB2	1	1
CMA Alloys	CMA1	1	1
	CMA2	1	1
High Tensile Brasses	HTB1	1	1
	HTB3	1	1
Group C			
Leaded Bronze	LB1	2	3
Gunmetal	G1	2	2
	G3	1	1
Sand Cast Brass	SCB4	1	1
90/10 Cupro-Nickel	-	1	1
70/30 Cupro-Nickel	-	1	1
Beryllium Copper	-	1	1