

**Table 12a: Wrought, Complex, Copper–zinc Alloys (Special Brasses) – Composition, Uses and Typical Properties**

Material Designation		Composition, %, Range or Max									Nearest Old BS Equivalent	Characteristics and Uses	Typical Mechanical Properties			
Symbol	Number	Cu	Al	Fe	Mn	Pb	Si	Sn	Others	Zn			0.2% Proof Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Elongation (%)	Hardness (HV)
<b>Corrosion Resistant Alloys</b>																
CuZn13Al1Ni1Si1	CW700R	81.0 - 86.0	0.7 - 1.2				0.8 - 1.3		0.8 - 1.4 Ni	Rem.	CZ127	Special purpose tubes	120-350	400-580	50-10	70-180
CuZn20Al2As	CW702R	76.0 - 79.0	1.8 - 2.3						0.02 - 0.06 As	Rem.	CZ110	Sea-water resistant alloys for condenser plates and tubes; heat exchangers.	140-380	340-540	60-20	80-160
CuZn28Sn1As	CW706R	70.0 - 72.5						0.9 - 1.3	0.02 - 0.06 As	Rem.	CZ111		110-410	320-460	60-20	80-160
CuZn30As	CW707R	69.0 - 71.0							0.02 - 0.06 As	Rem.	CZ126		110-410	320-460	60-20	80-160
CuZn38AlFeNiPbSn	CW715R	59.0 - 60.7	0.1 - 0.5	0.1 - 0.4		0.3 - 0.7		0.3 - 0.6	0.2 - 0.5 Ni	Rem.	–		160-220	400-460	25	115-130
CuZn38Sn1As	CW717R	59.0 - 62.0						0.5 - 1.0	0.02 - 0.06 As	Rem.	–		130-230	320-430	35-20	80-120
CuZn32Pb2AsFeSi	CW709R	64.0 - 66.5		0.1 - 0.2		1.5 - 2.2	0.45 - 0.8		0.03 - 0.08 As	Rem.	–		Complex DZR Brass	200-300	380-450	25-12
CuZn36Pb2Sn1	CW711R	59.5 - 61.5				1.3 - 2.2		0.5 - 1.0		Rem.	CZ134	Naval brasses for sea-water environments; 60-70% machinability when lead is included.	200-400	360-540	30-5	110-160
CuZn36Sn1Pb	CW712R	61.0 - 63.0				0.2 - 0.6		1.0 - 1.5		Rem.	CZ112		160-360	340-480	30-10	90-150
CuZn37Pb1Sn1	CW714R	59.0 - 61.0				0.4 - 1.0		0.5 - 1.0		Rem.	–		200-400	360-540	30-5	110-160
CuZn39Sn1	CW719R	59.0 - 61.0						0.5 - 1.0		Rem.	CZ133		160-360	340-480	30-10	190-210
<b>High Tensile Brasses</b>																
CuZn23Al6Mn4Fe3Pb	CW704R	63.0 - 65.0	5.0 - 6.0	2.0 - 3.5	3.5 - 5.0	0.2 - 0.8				Rem.	–	High strength structural materials. CW722R is aluminium-free and suitable for brazing and soldering. Machinability 50-80%.	500-540	700-800	10	190-210
CuZn25Al5Fe2Mn2Pb	CW705R	65.0 - 68.0	4.0 - 5.0	0.5 - 3.0	0.5 - 3.0	0.2 - 0.8				Rem.	CZ116		300-400	550-650	12	150-200
CuZn35Ni3Mn2AlPb	CW710R	58.0 - 60.0	0.3 - 1.3		1.5 - 2.5	0.2 - 0.8			2.0 - 3.0 Ni	Rem.	–		250-350	450-550	15	120-150
CuZn40Mn1Pb1AlFeSn	CW721R	57.0 - 59.0	0.3 - 1.3	0.2 - 1.2	0.8 - 1.8	0.8 - 1.6		0.2 - 1.0		Rem.	CZ114		200-380	450-580	30-15	130-170
CuZn40Mn1Pb1FeSn	CW722R	56.5 - 58.5		0.2 - 1.2	0.8 - 1.8	0.8 - 1.6		0.2 - 1.0		Rem.	CZ115		200-380	450-580	30-15	130-170
CuZn31Si1	CW708R	66.0 - 70.0					0.7 - 1.3			Rem.	–		Bearings and sliding stress requirements, synchro rings. Machinability 40-50%.	250-350	460-560	25-10
CuZn37Mn3Al2PbSi	CW713R	57.0 - 59.0	1.3 - 2.3		1.5 - 3.0	0.2 - 0.8	0.3 - 1.3			Rem.	CZ135	300-450		550-650	25-8	170-210
CuZn39Mn1AlPbSi	CW718R	57.0 - 59.0	0.3 - 1.3		0.8 - 1.8	0.2 - 0.8	0.2 - 0.8			Rem.	–	250-350		440-540	20-10	120-170
<b>Other Brasses</b>																
CuZn19Sn	CW701R	80.0 - 82.0						0.2 - 0.5		Rem.	–	Scouring pads.	–	350-900	55-35	70-180
CuZn23Al3Co	CW703R	72.0 - 75.0	3.0 - 3.8						0.25 - 0.55 Co	Rem.	–	Springs, connectors.	600-800	660-880	12-4	200-250
CuZn38Mn1Al	CW716R	59.0 - 61.5	0.3 - 1.3		0.6 - 1.8					Rem.	–	Medium strength structural materials.	200-350	450-570	20-8	130-160
CuZn40Mn1Pb1	CW720R	57.0 - 59.0			0.5 - 1.5	1.0 - 2.0				Rem.	CZ136		160-350	350-550	20-10	100-170
CuZn40Mn2Fe1	CW723R	56.5 - 58.5		0.5 - 1.5	1.0 - 2.0					Rem.	–		160-320	350-550	20-8	100-160