

**Wrought, Complex Copper-Zinc Alloys (Special Brasses)—Compositions, Properties, Standards and Uses**

Description	EN Number	EN Symbol	Nearest Old BS Equiv.	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)	1652 Plate, Sheet, Strip, Circles	1653 Plate, Sheet, Circles	12163 Rod	12164 Rod for Free-machining	12165 Forging Stock	12167 Profiles, Rectangular Bar	12168 Hollow Rod for Free-machining	12420 Forgings	12449 Tubes	Characteristics and Uses	
Corrosion Resistant Alloys	CW700R	CuZn13Al1Ni1Si1	CZ127	81.0-84.0	0.7-1.2	0.25	0.1	0.05	0.8-1.3	0.1	0.8-1.4 Ni	Rem.	120-350	400-580	50-10	70-180									HMR	Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.	
Corrosion Resistant Alloys	CW702R	CuZn20Al2As	CZ110	76.0-79.0	1.8-2.3	0.07	0.1	0.05	-	-	0.02-0.06 As 0.1 Ni	Rem.	140-380	340-540	60-20	80-160	HR	R								HMR	Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW706R	CuZn28Sn1As	CZ111	70.0-72.5	-	0.07	0.1	0.05	-	0.9-1.3	0.02-0.06 As 0.1 Ni	Rem.	110-410	320-460	60-20	80-160											Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW707R	CuZn30As	CZ126	69.0-71.0	0.02	0.05	0.1	0.07	-	0.05	0.02-0.06 As	Rem.	110-410	320-460	60-20	80-160											Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW709R	CuZn32Pb2AsFeSi	-	64.0-66.5	0.05	0.1-0.2	-	1.5-2.2	0.45-0.8	0.3	0.03-0.08 As 0.3 Ni	Rem.	200-300	380-450	25-12	115-145			MR	HM			HMR	HM			Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW711R	CuZn36Pb2Sn1	CZ134	59.5-61.5	-	0.1	-	1.3-2.2	-	0.5-1.0	0.3 Ni	Rem.	200-400	360-540	25-5	110-160											Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW712R	CuZn36Sn1Pb	CZ112	61.0-63.0	-	0.1	-	0.2-0.6	-	1.0-1.5	0.2 Ni	Rem.	160-360	340-480	30-10	90-150			HMR		HM	HMR		HM			Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW714R	CuZn37Pb1Sn1	-	59.0-61.0	-	0.1	-	0.4-1.0	-	0.5-1.0	0.3 Ni	Rem.	200-400	360-540	30-5	110-160											Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW715R	CuZn38AlFeNiPbSn	-	59.0-60.7	0.1-0.5	0.1-0.4	-	0.3-0.7	-	0.3-0.6	0.05 As 0.2-0.5 Ni	Rem.	160-220	400-460	25	115-130		R									Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW717R	CuZn38Sn1As	-	59.0-62.0	-	0.1	-	0.2	-	0.5-1.0	0.02-0.06 As 0.2 Ni	Rem.	130-230	320-430	35-20	80-120		R									Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
Corrosion Resistant Alloys	CW719R	CuZn39Sn1	CZ133	59.0-61.0	-	0.1	-	0.2	-	0.5-1.0	0.2 Ni	Rem.	160-360	340-480	30-10	190-210		R	HMR		HM	HMR		HM			Arsenic gives dezincification resistance tin corrosion resistance and lead machinability. Seawater resistant alloy for condenser plates and tubes, and heat exchangers. Offshore applications.
High Tensile Brasses	CW704R	CuZn23Al6Mn4Fe3Pb	-	63.0-65.0	5.0-6.0	2.0-3.5	3.5-5.0	0.2-0.8	0.2	0.2	0.5 Ni	Rem.	500-540	700-800	10	190-210			HMR		HM				HM		High strength structural materials.
High Tensile Brasses	CW705R	CuZn25Al5Fe2Mn2Pb	CZ116	65.0-68.0	4.0-5.0	0.5-3.0	0.5-3.0	0.2-0.8	-	0.2	1.0 Ni	Rem.	300-400	550-650	12	150-200									HM		High strength structural materials.
High Tensile Brasses	CW708R	CuZn31Si1	-	66.0-70.0	-	0.4	-	0.8	0.7-1.3	-	0.5 Ni	Rem.	250-350	460-560	25-10	120-160			HMR						HMR		Silicon gives wear resistance. Bearings and bushes.
High Tensile Brasses	CW710R	CuZn35Ni3Mn2AlPb	-	58.0-60.0	0.3-1.3	0.5	1.5-2.5	0.2-0.8	0.1	0.5	2.0-3.0 Ni	Rem.	250-350	450-550	15	120-150			HMR		HM	HMR		HM	HMR		High strength structural materials.
High Tensile Brasses	CW713R	CuZn37Mn3Al2PbSi	CZ135	57.0-59.0	1.3-2.3	1	1.5-3.0	0.2-0.8	0.3-1.3	0.4	1.0 Ni	Rem.	300-450	550-650	25-8	170-210				HMR	HM	HMR	HMR	HM	HMR		Silicon gives wear resistance. Bearings and bushes.
High Tensile Brasses	CW718R	CuZn39Mn1AlPbSi	-	57.0-59.0	0.3-1.3	0.5	0.8-1.8	0.2-0.8	0.2-0.8	0.5	0.5 Ni	Rem.	250-350	440-540	20-10	120-170									HMR		Silicon gives wear resistance. Bearings and bushes.
High Tensile Brasses	CW721R	CuZn40Mn1Pb1AlFeSn	CZ114	57.0-59.0	0.3-1.3	0.2-1.2	0.8-1.8	0.8-1.6	-	0.2-1.0	0.3 Ni	Rem.	200-380	450-580	30-15	130-170				HMR	HM	HMR	HMR	HM	HM		High strength structural materials.
High Tensile Brasses	CW722R	CuZn40Mn1Pb1FeSn	CZ115	56.5-58.5	0.1	0.2-1.2	0.8-1.8	0.8-1.6	-	0.2-1.0	0.3 Ni	Rem.	200-380	450-580	30-15	130-170				HMR	HM	HMR	HMR	HM	HM		High strength structural materials, suitable for brazing.
Other Brasses	CW701R	CuZn19Sn	-	80.0-82.0	-	0.05	-	0.05	-	0.2-0.5	0.3 Ni	Rem.		350-900	55-35	70-180											Not included in any BS EN product standard
Other Brasses	CW703R	CuZn23Al3Co	-	72.0-75.0	3.0-3.8	0.05	-	0.05	-	0.1	0.25-0.55 Co 0.3 Ni	Rem.	600-800	660-880	12-4	200-250											Springs and connectors.
Other Brasses	CW716R	CuZn38Mn1Al	-	59.0-61.5	0.3-1.3	1	0.6-1.8	1	0.5	0.3	0.6 Ni	Rem.	200-350	450-570	20-8	130-160									HMR		Good sliding properties due to Mn & Al. Medium strength structural materials.
Other Brasses	CW720R	CuZn40Mn1Pb1	CZ136	57.0-59.0	0.2	0.3	0.5-1.5	1.0-2.0	0.1	0.3	0.6 Ni	Rem.	160-350	350-550	20-10	100-170				HMR	HM	HMR	HMR	HM			Good sliding properties due to Mn & Al. Medium strength structural materials.
Other Brasses	CW723R	CuZn40Mn2Fe1	-	56.5-58.5	0.1	0.5-1.5	1.0-2.0	0.5	0.1	0.3	0.6 Ni	Rem.	160-320	350-550	15-10	100-160									HMR		Good sliding properties due to Mn & Al. Medium strength structural materials.
Other Brasses	CW724R	CuZn21Si3P	-	75.0-77.0	0.05	0.3	0.05	0.1	2.7-3.5	0.3	0.2 Ni 0.02-0.10 P	Rem.	350-450	500-650	30-10	110-210			HMR	HMR	HM	HMR	HMR	HM	HMR		Lead free, free machining.
Other Brasses	CW725R	CuZn33Pb1AlSiAs	-	64.0-67.0	0.1-0.4	0.3	0.1	0.4-0.9	0.1-0.3	0.3	0.05-0.08 As 0.2 Ni	Rem.	200-250	290-400	30-Oct	70-135				HMR	HM	HMR	HMR	HM			DZR. Approved for drinking water contact under 4MS.

**About this table**

This table provides information on wrought, complex, copper-zinc (special brasses). Compositions, typical mechanical properties, relevant standards, characteristics and uses are shown.

Note that not all elements listed as impurities are shown here. For the full chemical composition you should refer to the standard or the Copper and copper alloys. Compendium of compositions and products PD CEN/TS 13388.

For more detail, the appropriate standard(s) should be consulted.

**Table notes**

Compositions are given as either a range or a maximum. The material conditions defined by the standards are given and—where mandatory—this is indicated

1652, 12163, 12167 and 12449 are for general purposes. 1653 is for boilers, pressure vessels and hot water storage units. 1N/mm<sup>2</sup> = 1MPa

H – mandatory hardness  
M – as manufactured  
R – mandatory tensile strength

**Disclaimer**

While this data has been prepared with care, European Copper Institute provides no warranty with regards to the content and shall not be liable for any direct, incidental or consequential damages that may result from the use of the information or the data contained.

© European Copper Institute 2020

copperalliance.eu