CuZn28

Comparable standards: UNS C25600 • EN CW504L
Aurubis designations: • PNA 225

Description

CuZn28 is a solid solution strengthened copper alloy containing 28% zinc (brass). The alloy has very good cold forming properties and can be brazed and soldered, welding processes need to be executed with care, due to the high zinc content.
As the zinc content increases, the strength improves, yet the conductivity and ductility are reduced and the alloy gets more susceptible to stress corrosion cracking if exposed to an ammonia atmosphere, compared to pure copper. If exposed to an ammonia atmosphere, CuZn28 should be stress relieved.
Due to the raised zinc content the alloy has economical advantages.
Fields of application are metal ware and deep drawing parts, automotive, heat exchangers, connectors, chains, coolers and components of electrical and mechanical engineering.

Composition

Cu [%]	Fe [%]	Pb [%]	Zn [%]	Al [%]	Ni [%]	Sn [%]
71-73	0.05 max	0.05 max	rem	0.02 max	0.3 max	0.1 max

This alloy is in accordance with RoHS 2002/96/CE for electric & electronic components and 2002/53/CE for the automotive industry.

Physical properties

Melting point [°C]	Density [g/cm³]	c_p @ 20°C [kJ/kgK]	Electrical cond. [%IACS]	Thermal cond. [W/mK]	Young's modulus [GPa]	α @ 20°C [10^{-6}/K]
954	8.56	0.378	≥29	123	110	20

Note: The specified conductivity applies to the soft condition only.

c_p specific heat capacity
α coefficient of thermal expansion

Mechanical properties

	Tensile Strength [MPa]	Yield Strength [MPa]	Elongation A_{50} [%]	Hardness HV [-]	Bend ratio 90° [r] GW	Bend ratio 90° [r] BW
R270	270-350	≤ 160	≥ 40	55-90	0	0
R350	350-430	≥ 170	≥ 21	95-125	0	0
R410	410-490	≥ 260	≥ 9	120-155	0	0
R480	480-560	≥ 430	≥ 4	150-180	0	1
R550	550-640	≥ 530	≥ 2	170-200	0.5	2
R630	≥ 630	≥ 610	-	≥190	1	3

Other tempers are available upon request.

r = x * t (thickness t ≤ 0.5mm)
GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

Fabrication properties

Cold formability	excellent
Hot formability	fair
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	good
Gas shielded arc welding	good
Resistance welding	fair
Machinability	fair

Electrical conductivity	The electrical conductivity depends on chemical composition, the level of cold deformation and the grain size. A high level of deformation as well as a small grain size decrease the conductivity.
Corrosion Resistance	Brass is resistant to: Natural, industrial and salt bearing atmospheres, drinking water, alkaline and neutral saline solutions. Brass is not resistant to: Acids, ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres as well as sea water (especially at high flow rates). Under certain circumstances (high Cl content and low carbon-hardness) dezincification can be an issue with CuZn28. The alloy also has a certain sensitivity to stress corrosion cracking when exposed to certain environments (e.g. ammonia, amine or sal ammoniac). The alloy should be stress relieved if stress corrosion cracking might be an issue.
Typical uses	Deep drawn parts, screws, mechanical engineering, Automotive, components of electrical engineering, hard ware, connectors, cases, chains, heat exchangers, coolers, springs, fittings, locks, watch industry, jewelry

CuZn10

Comparable standards: UNS C22000 • EN CW501L • JIS C2200
Aurubis designations: C220 • PNA 222

Description

CuZn10 is a solid solution strengthened copper alloy containing 10% zinc (brass). CuZn10 has very good cold fomability and is suited for bending, stamping and other cold forming processes. The alloy may be soldered, brazed or welded. As the zinc content increases, the strength improves, yet the conductivity and ductility are reduced. CuZn10 has a good resistance to stress corrosion cracking, yet the alloy should be stress relieved if exposed to an ammonia atmosphere.
Due to the raised zinc content brass has economical advantages.
Fields of application are architecture, stamped and deep drawn products, dry goods, jewelry, cosmetic packaging and components of mechanical and electrical engineering.

Composition

Cu [%]	Fe [%]	Pb [%]	Zn [%]	Al [%]	Ni [%]	Sn [%]
89-91	0.05 max	0.05 max	rem	0.02 max	0.3 max	0.1 max

This alloy is in accordance with RoHS 2002/96/CE for electric & electronic components and 2002/53/CE for the automotive industry.

Physical properties

Melting point [°C]	Density [g/cm³]	c_p @ 20°C [kJ/kgK]	Electrical cond. [%IACS]	Thermal cond. [W/mK]	Young's modulus [GPa]	α @ 20°C [10^{-6}/K]
1043	8.8	0.38	≥43	189	117	18.4

Note: The specified conductivity applies to the soft condition only.

c_p specific heat capacity
α coefficient of thermal expansion

Mechanical properties

	Tensile Strength [MPa]	Yield Strength [MPa]	Elongation A_{50} [%]	Hardness HV [-]	Bend ratio 90° [r] GW	Bend ratio 90° [r] BW	Bend ratio 180° [r] GW	Bend ratio 180° [r] BW
R240	240-290	≤ 140	≥ 36	50-80	0	0	0	0
R280	280-360	≥ 200	≥ 13	80-110	0	0	0	0.5
R350	≥ 350	≥ 290	≥ 4	≥ 110	0	0.5	1	1.5

Other tempers are available upon request.

r = x * t (thickness t ≤ 0.5mm)
GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

Fabrication properties

Cold formability	excellent
Hot formability	good
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	good
Gas shielded arc welding	good
Resistance welding	not recommended
Machinability	not recommended

Electrical conductivity

The electrical conductivity depends on chemical composition, the level of cold deformation and the grain size. A high level of deformation as well as a small grain size decrease the conductivity.

Corrosion Resistance	Brass is resistant to: Natural, industrial and salt bearing atmospheres, drinking water, alkaline and neutral saline solutions. Brass is not resistant to: Acids, ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres as well as sea water (especially at high flow rates). CuZn10 is hardly sensitive to stress corrosion cracking and is resistant to dezincification, different to brass alloys with higher zinc contents. Yet the alloy should be stress relieved if stress corrosion cracking might be an issue.
Typical uses	Architectural, stamped and deep drawn products, jewelry, dry goods, comsmetic packaging, components of electrical engineering, mechanical and building engineering.

INTERNATIONAL STANDARD

EGM Group Standard	EN	CEN	ASTM (CDA)	AFNOR	BS	JIS
EGMO90	CuZn10	CW501L	C22000	CuZn10	CZ101	C2200

APPLICATION

Industrial rolled products	
Electric and Electronic	lugs, connectors, terminals, lamp holder, plugs, relais, pins, multi-plug, clamp.
Mechanical	shearing, small parts, connectors, household appliance, eyelets.
Fashion	eyelets, zip, buttons, fastener, clasp.
Ammunition	Ammunition
Building products	
Other	bath accessories, shower hose, handle, chandelier, profiles, medals, cups, chain beads.

PROPERTIES

Shearing	☆☆☆
Deep drawing	☆☆☆☆
Surface treatment	☆☆☆☆
Welding	☆☆☆☆
Bending	☆☆☆☆

PHYSICAL PROPERTIES

EGM Group Standard	DENSITY [g/cm³]	ELECTRICAL CONDUCTIVITY [MS/m]	ELECTRICAL CONDUCTIVITY [IACS]	THERMAL CONDUCTIVITY [W/(m•K)]		
EGMO90	8,80	min. 22	min. 38	min.188		

CHEMICAL COMPOSITION

EGM Group Standard	EN / CEN	%	Cu	Zn	Pb	Sn	Fe	Ni	Al	Σ Other
EGMO90	CuZn10 CW501L	min. max.	89,0 91,0	Resto	- 0,05	- 0,1	- 0,05	- 0,3	- 0,02	- 0,1

MECHANICAL PROPERTIES

EGMO90 CuZn10 - CW501L	Designation	TENSILE STRENGHT		ELONGATION		HARDNESS		GRAIN	
		Rm (N/mm²)		A50mm % thickness ≤2,5 mm	A5% thickness >2,5 mm	HV		mm	
		min.	max.	min.	min.	min.	max	min.	max
	R240	240	290	36	45	-	-	-	-
	H050	-	-	-	-	50	80	-	-
	R280	280	360	13	20	-	-	-	-
	H080	-	-	-	-	80	110	-	-
	R350	350	-	4	8	-	-	-	-
	H110	-	-	-	-	110	-	-	-

SUPPLY SPECIFICATIONS

	**COIL "EYE TO THE WALL"**	Thickness Width Ext. diameter Int. diameter Weight/mm.	0,10 - 3,00 100 - 720 < 1500 300 - 400 - 500 13,5	mm mm mm mm kg
	**COIL "EYE TO THE SKY"**	Thickness Width Ext. diameter Int. diameter Weight/mm.	0,10 - 3,00 3 - 720 < 1500 100 - 140 - 300 - 400 - 500 13,5	mm mm mm mm kg
	**TRAVERSE WINDING**	Thickness Width Spool width Int. Diameter spool Int. Hole Weight	0,15 -2,00 4 - 60 100-170-200-250-300-330-350-400 200 - 340 - 440 90 - 130 - 300 - 400 50 - 1500	mm mm mm mm mm kg
	**MULTISTRIP**	Thickness Width Ext. diameter Int. diameter Weight/strip Weight/mm.	0,15 - 1,50 10 - 50 < 1500 300 - 400 - 500 < 500 12	mm mm mm mm Kg kg
	**SHEETS**	Thickness Width Length Standard dimensions Weight per pack	0,5 - 3,00 20 - 720 < 2000 1340 x 500 < 2000	mm mm mm mm kg
	**DISCS**	Thickness Diameter	0,5 - 1,50 70-75-80-85-90-95-100-105-110-115-120-125-130-135-138-140-145-150-155-160-165-170-175-180-185-190-195-198-200-205-210-215-220-225-230-240-245-260- 280-290-390-395,6-420,6-430-432,6-450-454,6-460-482-490,6-495,6-508-520,6-525,6-560,6-665	mm mm

SURFACE TREATMENT

It's possible to supply strips with hot-dip, electrolytic and electrolytic with reflow surface treatment, with full surface or selective plating.

INTERNATIONAL STANDARD

EGM Group Standard	EN	CEN	ASTM (CDA)	AFNOR	BS	JIS
EGMO70	CuZn30	CW505L	C26000	CuZn30	CZ106	C2600

APPLICATION

Industrial rolled products	
Electric and Electronic	lugs, connectors, terminals, lamp holder, plugs, relais, pins, multi-plug, clamp.
Automotive	car parts, radiator tanks, connectors, clamp.
Mechanical	shearing, small parts, connectors, household appliance, eyelets.
Fashion	eyelets, zip, buttons, fastener, clasp.
Ammunition	Ammunition
Building products	
Other	bath accessories, shower hose, handle, chandelier, profiles, medals, cups, chain beads.

PROPERTIES

Shearing	☆☆☆☆
Deep drawing	☆☆☆☆
Surface treatment	☆☆☆☆
Welding	☆☆☆☆
Bending	☆☆☆☆

PHYSICAL PROPERTIES

EGM Group Standard	DENSITY [g/cm³]	ELECTRICAL CONDUCTIVITY [MS/m]	ELECTRICAL CONDUCTIVITY [IACS]	THERMAL CONDUCTIVITY [W/(m•K)]		
EGMO70	8,53	min. 13	min. 23	min.121		

CHEMICAL COMPOSITION

EGM Group Standard	EN / CEN	%	Cu	Zn	Pb	Sn	Fe	Ni	Al	Σ Other
EGMO70	CuZn30 CW505L	min. max.	69,0 71,0	Resto	- 0,05	- 0,1	- 0,05	- 0,3	- 0,02	- 0,1

MECHANICAL PROPERTIES

	Designation	TENSILE STRENGHT		ELONGATION		HARDNESS		GRAIN	
		Rm (N/mm²)		A50mm % thickness ≤2,5 mm	A5% thickness >2,5 mm	HV		mm	
		min.	max.	min.	min.	min.	max	min.	max
EGMO70 CuZn30 - CW505L	R270	270	350	40	50	-	-	-	-
	H055	-	-	-	-	55	90	-	-
	G010	(410)	(40)	-	-	120	-	0,015	
	G020	(360)	(40)	-	-	95	0,015	0,030	
	G030	(340)	(40)	-	-	90	0,020	0,040	
	G050	(330)	(40)	-	-	80	0,035	0,070	
	G075	(310)	(50)	-	-	70	0,050	0,100	
	R350	350	430	21	33	-	-	-	-
	H095	-	-	-	-	95	125	-	-
	R410	410	490	9	15	-	-	-	-
	H120	-	-	-	-	120	155	-	-
	R480	480	-	-	-	-	-	-	-
	H150	-	-	-	-	-	150	-	-

SUPPLY SPECIFICATIONS

	**COIL "EYE TO THE WALL"**	Thickness Width Ext. diameter Int. diameter Weight/mm.	0,10 - 3,00 100 - 720 < 1500 300 - 400 - 500 13,5	mm mm mm mm kg
	**COIL "EYE TO THE SKY"**	Thickness Width Ext. diameter Int. diameter Weight/mm.	0,10 - 3,00 3 - 720 < 1500 100 - 140 - 300 - 400 - 500 13,5	mm mm mm mm kg
	**TRAVERSE WINDING**	Thickness Width Spool width Int. Diameter spool Int. Hole Weight	0,15 -2,00 4 - 60 100-170-200-250-300-330-350-400 200 - 340 - 440 90 - 130 - 300 - 400 50 - 1500	mm mm mm mm mm kg
	**MULTISTRIP**	Thickness Width Ext. diameter Int. diameter Weight/strip Weight/mm.	0,15 - 1,50 10 - 50 < 1500 300 - 400 - 500 < 500 13,5	mm mm mm mm Kg kg
	**SHEETS**	Thickness Width Length Standard dimensions Weight per pack	0,5 - 3,00 20 - 720 < 2000 1340 x 500 < 2000	mm mm mm mm kg
	**DISCS**	Thickness Diameter	0,5 - 1,50 70-75-80-85-90-95-100-105-110-115-120-125-130-135-138-140-145-150-155-160-165-170-175-180-185-190-195-198-200-205-210-215-220-225-230-240-245-260- 280-290-390-395,6-420,6-430-432,6-450-454,6-460-482-490,6-495,6-508-520,6-525,6-560,6-665	mm mm

SURFACE TREATMENT

It's possible to supply strips with hot-dip, electrolytic and electrolytic with reflow surface treatment, with full surface or selective plating.