C22000
CuZn10

KME

Industrial Rolled

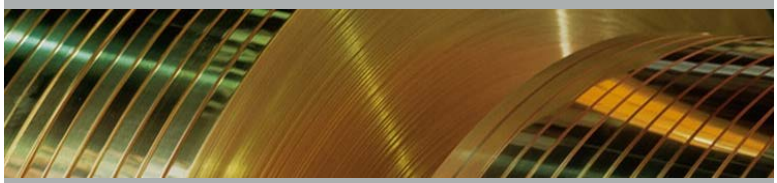
Alloy Designation	
EN	CuZn10
DIN CEN/TS 13388	CW501L
JIS	
BS	
UNS	C22000

Chemical Composition
Weight percentage

Cu	89 .. 91	%
Zn	Rest	%
Ni	≤ 0.3	%
Sn	≤ 0.1	%
Fe	≤ 0.05	%

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

Brass Rolled Products



KME offers a wide range of brass rolled products in the form of strips, sheets and discs in order to meet our customer's needs for industrial manufacturing or for the production of gift articles and decorative objects.

Characteristics

CuZn10 has very good cold forming properties and is well suited for e.g. coinage, beating, embossing. This alloy has a higher strength as pure copper. It has good welding and brazing properties as well as a good corrosion resistant and is not fragile to stress corrosion and dezincification. CuZn10 is principally used in jewellery, metal goods, watch industry and in electronic industry for installation parts.
We produce qualities with grain sizes below 5 µm if needed.

Main Applications

Architecture: Weather Stripping, Screen Cloth, Ornamental Trim, Etching Bronze, Grill Work.
Builders Hardware: Kick Plates, Hardware.
Consumer: Housing for Lipstick Compacts, Costume Jewelry, Caskets, Ball Point Pens.
Electrical: Wave Guides, Rotor Bar-AC Motors, Cable Warp.
Fasteners: Screw Shells, Bolts, Line Clamps, Rivets.
Industrial: Base for Vitreous Enamel, Escutcheons, Flexible Tube, Studs.
Marine: Marine Hardware.
Ordnance: Small Arms Cartridges, Artillery Projectile Rotating Bands, Press Fit, Primer Caps.
Plumbing: Plumbers Brass Goods
Typical Applications: Jewellery and metal good, Components for the electrical industry, Leadframes.

Preferred Applications

Jewellery and Metall Goods	Deep Drawn Parts	Components for the Electrical Industry	Stamped Parts	Connectors
xx	xx	xx	xx	xx

x = well suited xx = particularly well suited

Physical Properties
Typical values in annealed temper at 20 °C

Density		8.80	g/cm³
Thermal expansion coefficient	-128 .. 20 °C	9.0	10^{-6}/K
	20 .. 300 °C	18.2	10^{-6}/K
Specific heat capacity		0.376	J/(g·K)
Thermal conductivity		184	W/(m·K)
Electrical conductivity (1 MS/m = 1 m/(Ω mm²)		>25	MS/m
Electrical conductivity (IACS)		43	%
Thermal coefficient of electrical resistance (0 .. 100 °C)		1.8	10^{-3}/K
Modulus of elasticity (1 GPa = 1 kN/mm²) cold formed		99 .. 115	GPa
	annealed	124	GPa

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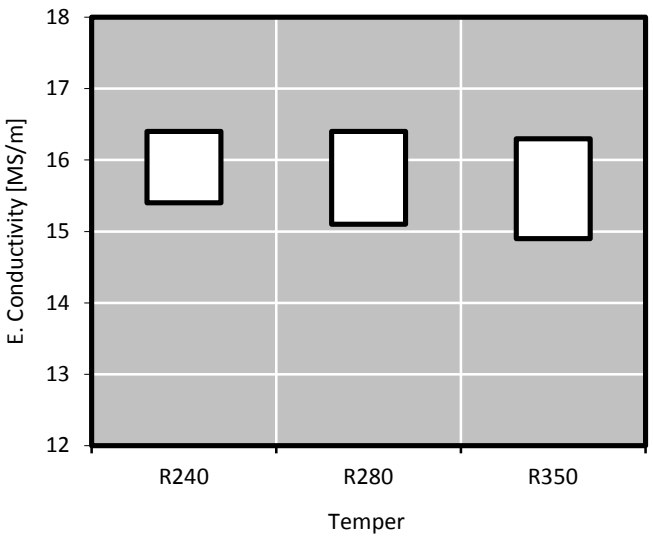
Mechanical Properties (EN 1652)					
Temper		**Tensile Strength Rm**	**Yield Strength $Rp_{0.2}$***	**Elongation Minimum A_{50mm}**	**Hardness HV ***
		MPa	MPa	%	HV
R240	annealed	240 .. 290	≤ 140	36	50 ..100
R280		280 .. 360	≥ 200	13	80 ..130
R350		350 .. 450	≥ 290	4	110 ..160

* only for information

Electrical Conductivity



Electrical conductivity is strongly influenced by chemical composition. A high level of cold deformation and small grain size decrease the electrical conductivity moderately. Minimum conductivity level can be specified.

Fabrication Properties*	
Cold Forming Properties Max. 90% between annealings	Good
Hot Forming Properties at 750 .. 870°C	Good
Machinability (Rating 30)	Less suitable
Electroplating Properties	Excellent
Hot Tinning Properties	Excellent
Soft Soldering, Brazing	Excellent
Resistance Welding	Good
Gas Shielded Arc Welding	Good
Laser Welding	Fair
Soft Annealing	450 .. 680°C
Stress Relieving Annealing	200 .. 300°C

* For more details call our technical service

Corrosion Resistance*

CuZn10 has good resistance to: Fresh water, neutral or alkaline saline Solutions, organic compounds as well as land, sea, and industrial atmosphere.

Not resistant to: acids, hydrous sulphur compounds, hydrous ammonia in the non-stress-relieved condition. Low sensitivity to stress corrosion cracking.

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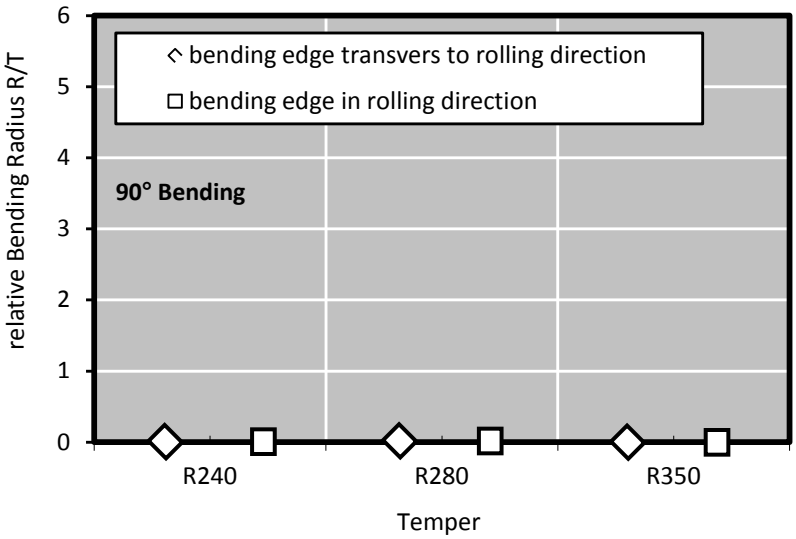
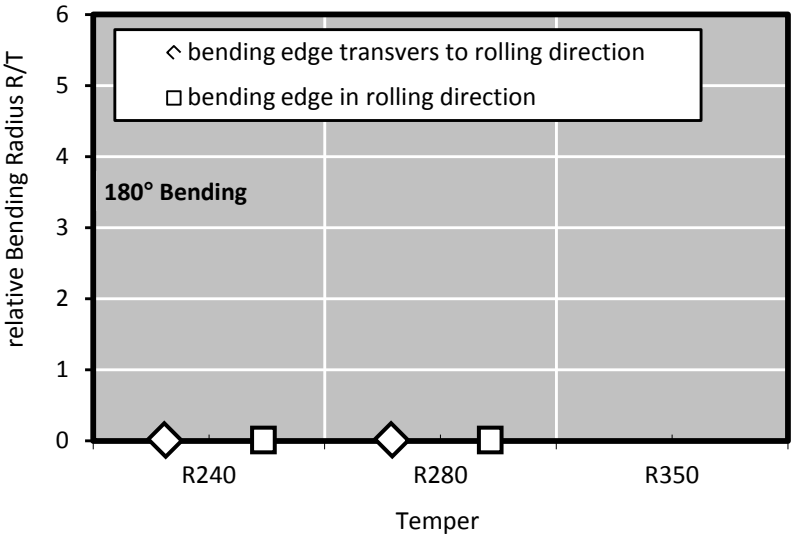
Bending Properties **Thickness: ≤ 0.5 mm**

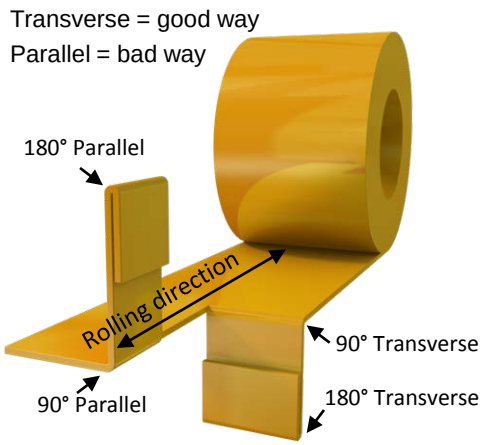




Bending test according to EN ISO 7438 is done with 10 mm wide samples. Smaller samples in general – as well as lower thickness – allow a lower bending radius without cracks. If needed we supply bending optimized temper classes that far exceed standard quality.

Please take care when comparing with ASTM E 290 results, there the bend definition direction is contradictory.

Bending Definition



Minimum Bending Radius Calculation

To find out the minimum possible bending radius take the R/T value from the list.

Example: R/T = 0.5 and thickness 0.3 mm

Minimum radius = (R/T) x thickness
= 0.5 x 0.3 mm = 0.15 mm

Bending Properties*

Temper	Thickness Range	Bending 90°		Bending 180°	
		Trans-vers	Parallel	Trans-vers	Parallel
	mm	R/T	R/T	R/T	R/T
R240	≤ 0.5	0	0	0	0
R280	≤ 0.5	0	0	0	0
R350	≤ 0.5	0	0	-	-

* Measured at sample width 10 mm according to EN 1654
Possible bending radius = (R/T) x thickness

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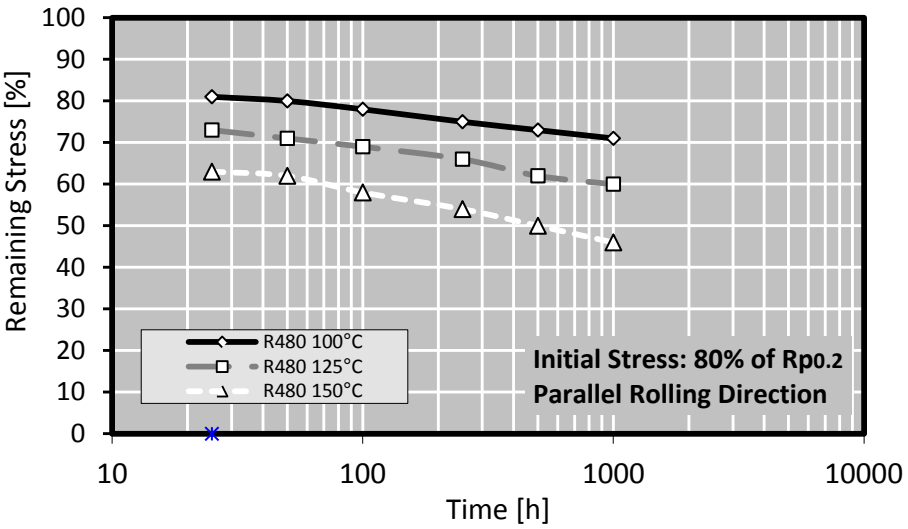
Relaxation Properties

Values from CuZn15 Thermal stress relieved
CuZn10 will have lower remaining stress



Stress relaxation is tested with cantilever bending test equipment. This method is taking short time relaxation into account. so that the values achieved are very realistic, while other test methods like tube test pretend better properties from the achieved values. Relaxation values give an indication about stress relieve of strip under tension for a certain time and temperature. As it is measured on plain strip. the behaviour of deformed parts may differ. nevertheless the ratio between the different tempers remains the same.

Typical test sample thickness is 0.3 – 0.6 mm.

Bend Fatigue (at room temperature)

The fatigue strength gives an indication about the resistance to variations in applied tension. It is measured under symmetrical alternating load. The maximum bending load for 10^7 load cycles without crack is measured. Dependent on the temper class it is approximately 1/3 of the tensile strength R_m.

Standards for copper and copper alloys	
EN 1652	Plate, sheet, strip and circles for general purposes
EN 1654	Strip for springs and connectors
EN 1758	Strip for lead frames
EN 13148	Hot-dip tinned strip
EN 13599	Copper plate, sheet and strip for electrical purposes
EN 14436	Electrolytically tinned strip

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Brass Processing

KME	Alloy	Machining	Mechanical Polishing	Electro Polishing	Brazing	Gas Welding	Gas Shielded Arc Welding	Resistance Welding	Laser Welding
305	CuZn5	4	1	1	1	2	2	2	3
310	CuZn10	4	1	1	1	2	2	2	3
315	CuZn15	4	1	1	1	2	2	2	3
320	CuZn20	4	1	1	1	2	2	2	3
328	CuZn28	4	1	1	1	2	3	2	4
330	CuZn30	4	1	1	1	2	3	2	4
333	CuZn33	4	1	1	1	2	3	2	4
336	CuZn36	3	1	2	1	2	3	2	4
337	CuZn37	3	1	3	1	2	3	2	4
339	CuZn39Pb2	1	2	4	3	4	4	3	4
340	CuZn40	3	2	3	2	4	3	2	4
	CuSn3Zn9 CuSn2Zn10	3	1	2	1	2	2	3	3

1= excellent **2 = good** **3 = fair** **4 = less suitable**

Phase Diagram Copper Zink (after Struers Scientific Instruments)