

Alloy Designation	C15100
EN	-
DIN CEN/TS 13388	-
UNS	C15100
JAPAN	C 1510 JIS H 3100

Chemical Composition		
Weight percentage		
Cu	Rest	%
Zr	0.1	%

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

High Performance STOL® Alloys



We have developed a wide range of high performance copper alloys with excellent properties regarding conductivity, strength, corrosion behaviour, bendability and relaxation properties. STOL® alloys are the first choice materials for high-end applications and products.

Characteristics

C15100 is a CuZr alloy that can be hardened by cold forming and moderately by precipitation of CuZr - phases during a heat treatment. It has good bendability, excellent hot and cold forming properties, a high strength and a good corrosion resistance.

Due to the low diffusion of Zr in Cu the softening resistance and relaxation properties, even at temperatures up to 150°C are excellent. The electrical and thermal conductivity is excellent. Welding and brazing properties are good, soldering properties are excellent.

Main Applications

Automotive Switches and Relays, Contacts, Connectors, Terminals, Hybrid Cars
Electrical Electronic Circuits, Electrical Connectors, Lead Frames, Switches, Switch Blade Jaws, Commutators for Power, Transmitters, Bases for Power Transmitters, Rectifiers, Soldering and Welding Tips, Circuit Breakers, High Temperature

Preferred Applications

Spring Contact	Switches and Relays	High Temperature Range >150°C	Current Carrying Capacity
xx	xx	xx	xx

x = well suited xx = particularly well suited

Physical Properties

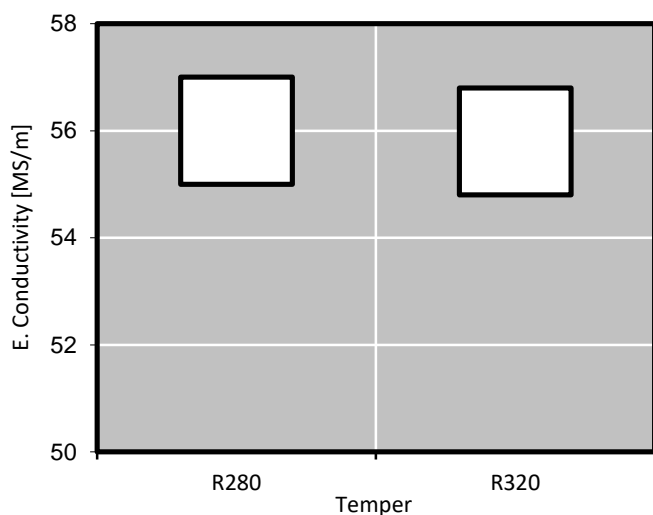
Typical values in annealed temper at 20 °C

Density	8.9	g/cm ³
Thermal expansion coefficient 20 .. 300 °C	17.6	10 ⁻⁶ /K
Specific heat capacity	0.385	J/(g·K)
Thermal conductivity	360	W/(m·K)
Electrical conductivity (1 MS/m = 1 m/(Ω mm ²))	55	MS/m
Electrical conductivity (IACS)	95	%
Thermal coefficient of electrical resistance (0 .. 100 °C)	3	10 ⁻³ /K
Modulus of elasticity (1 GPa = 1 kN/mm ²) cold formed	120	GPa

Mechanical Properties				
Temper	Tensile Strength	Yield Strength Minimum	Elongation Minimum	Hardness
	Rm	Rp _{0.2}	A _{50mm}	HV *
	MPa	MPa	%	HV
R280 (H01)	280 .. 310	190	13	80 .. 100
R300 (H02)	300 .. 360	280	6	95 .. 115
R320 (H03)	320 .. 390	310	5	100 .. 125
R360 (H04)	360 .. 430	350	4	120 .. 145
R400 (H06)	400 .. 450	390	3	125 .. 150
R440 (H08)	440 .. 490	430	2	≥ 135

*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.

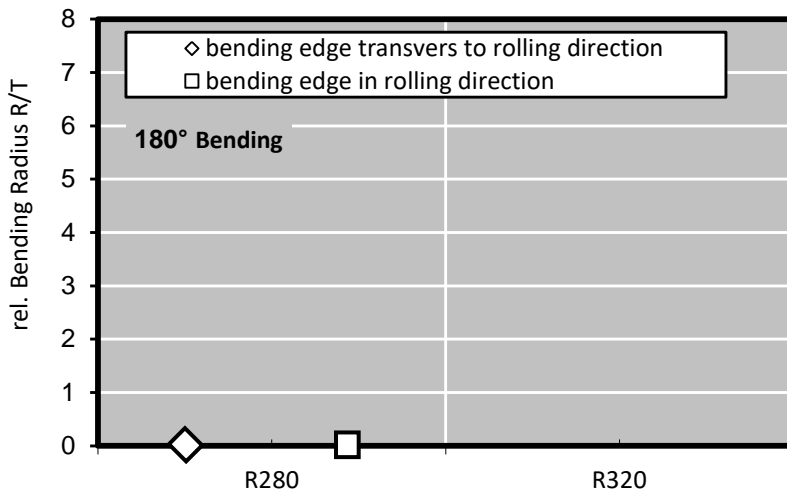
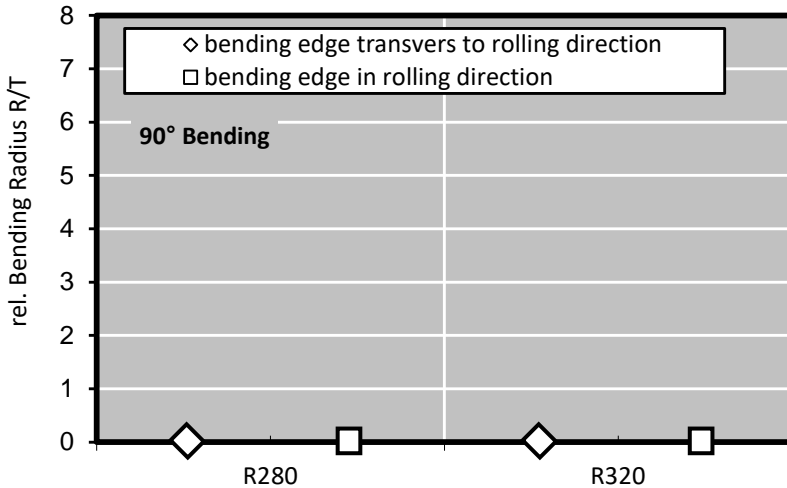
Fabrication Properties*	
Cold Forming Properties	Excellent
Machinability (Rating 20)	Less suitable
Electroplating Properties	Good
Hot Tinning Properties	Good
Soft Soldering, Brazing	Excellent
Resistance Welding	Less suitable
Gas Shielded Arc Welding	Less suitable
Laser Welding	Fair

* For more details call our technical service

Corrosion Resistance*
C15100 is resistant to pure water vapour and non oxidizing acids and alkalis as well as neutral saline solutions.
The material is insensitive to stress corrosion cracking.

* For more details call our technical service

Bending Properties Thickness: ≤ 0.5 mm

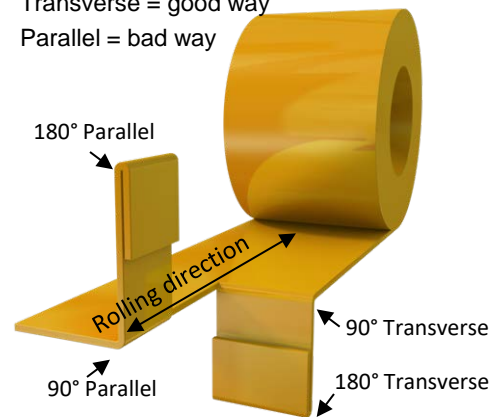


Bending test according to EN ISO 7438 is done with 10 mm wide samples. Smaller samples in general – as well as lower thickness – allow a lower bending radius without cracks. If needed we supply bending optimized temper classes that far exceed standard quality.

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

Bending Definition

Transverse = good way
 Parallel = bad way



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

$$\begin{aligned} \text{Minimum radius} &= (R/T) \times \text{thickness} \\ &= 0.5 \times 0.3 \text{ mm} = 0.15 \text{ mm} \end{aligned}$$

Bending Properties*

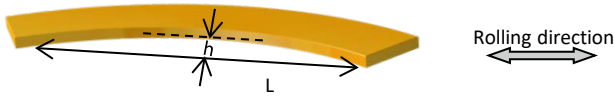
Temper	Thickness Range	Bending 90°		Bending 180°	
		Transvers	Parallel	Transvers	Parallel
	mm	R/T	R/T	R/T	R/T
R280	≤ 0.5	0	0	0	0
R320	≤ 0.5	0	0		

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

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 10⁷ load cycles without crack is measured. Dependent on the temper class it is approximately 1/3 of the tensile strength R_m.

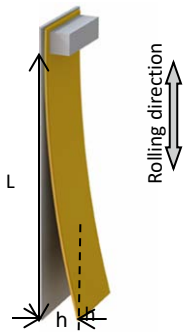
Camber



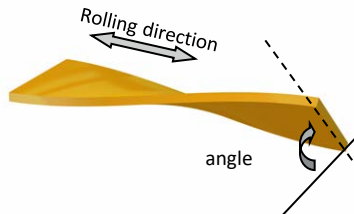
Evenness



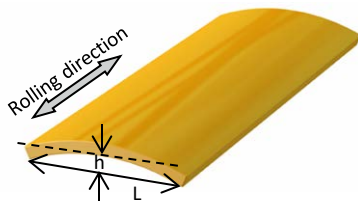
Coil set



Twist



Transverse Flatness



Evenness Tolerance

Thickness Range [mm]	Width Range [mm]		
	7 .. 20	21 .. 50	51 .. 100
0.10 .. 0.50	+0.10	+0.20	+0.30
0.50 .. 1.00	+0.15	+0.25	+0.35

Width Tolerance Standard / Precision

Thickness Range [mm]	Width Range [mm]					
	10 .. 50	51 .. 100	101 .. 200	201 .. 350	351 .. 700	700 .. 1.250
0.10 .. 1.00	+0.2 / +0.1	+0.3 / +0.2	+0.4 / +0.3	+0.6 / +0.4	+1.0 / +0.5	-
0.20 .. 1.00	+0.2 / +0.1	+0.3 / +0.2	+0.4 / +0.3	+0.6 / +0.4	+1.0 / +0.5	+2.0
1.01 .. 2.00	+0.3 / +0.2	+0.4 / +0.2	+0.5 / +0.4	+1.0 / +0.6	+1.5 / +0.7	+2.0
2.01 .. 3.00	+0.5 / +0.3	+0.6 / +0.3	+0.7 / +0.5	+1.2 / +0.7	+2.0 / +0.9	+3.0
3.01 .. 6.00	+2.0 / -	+2.3 / -	+2.5 / -	+3.0 / -	+4.0 / -	+6.0

Customized Tolerances

Our products are produced in accordance with relevant norms EN 1652 / EN 1654. Customer specific tolerances for Thickness, Width, Camber, Transverse Flatness, Evenness, Twist and Coil set can be defined. We will be happy to meet your demands. EN 1652 defines only camber.

Thickness Tolerance

Thickness Range [mm]	EN 1652 ≤350 mm [mm]	KME Standard [mm]	KME Precision [mm]
0.10 .. 0.20	± 0.018	± 0.005	± 0.004
0.21 .. 0.30	± 0.022	± 0.007	± 0.005
0.31 .. 0.40	± 0.025	± 0.015	± 0.006
0.41 .. 0.50	± 0.030	± 0.015	± 0.008
0.51 .. 0.60	± 0.040	± 0.017	± 0.010
0.61 .. 0.70	± 0.040	± 0.020	± 0.010
0.71 .. 0.85	± 0.040	± 0.022	± 0.012
0.86 .. 1.30	± 0.050	± 0.025	± 0.015
1.31 .. 2.00	± 0.060	± 0.030	± 0.020
2.01 .. 3.00	± 0.070	± 0.045	± 0.025
3.00 .. 4.00	± 0.100	± 0.050	± 0.025
4.00 .. 6.00	± 0.120	± 0.060	± 0.030

Roughness

Ra [μm]	Thickness [mm]
0.13 .. 0.18	0.1 .. 2.0
0.20 .. 0.30	0.1 .. 2.0
0.35 .. 0.46	0.1 .. 2.0
On request	> 2.0

Formats	Dimension*			
	Coil	Strip thickness (other thicknesses on request)	≥ 0.1 .. 6.00	mm
		Strip width	≥ 3 .. 1.250	mm
		Outside diameter	≤ 1.400	mm
		Weight (Standard)	≤ 8.400	kg
		Weight (Deep-Drawing Quality)	≤ 8.000	kg
		Weight per mm	≤ 12.0	kg
	Traverse wound strip	Thickness	≥ 0.2 .. ≤ 1.50	mm
		Width	≥ 8 .. ≤ 60.0	mm
		Weight	300 .. 1.500	kg
		Drums: wood, plastic, metal, flangeless		
	TECSTRIP® _multicoil	Thickness	0.18 .. 0.80	mm
		Width	15 .. 50	mm
		Inner diameter 300 mm for thickness	0.15 .. 0.80	mm
		Inner diameter 400 mm for thickness	0.41 .. 0.80	mm
		Maximum weight	5.000	kg
		Outer diameter maximum	1.600	mm
	Sheet ≤ 6.35 mm	Thickness	0.3 .. 6.35	mm
		Width	50 .. 1.250	mm
		Length	200 .. 6.500	mm
		Weight	2.800 .. 8.000	kg
		Sheets in standard dimensions e.g. 1,000 x 2,000 mm		
	Sheet > 6.35 mm	Thickness	6.35 .. 9.50	mm
		Width	50 .. 2.450	mm
		Length	200 .. 7.500	mm
		Weight	≤ 10.000	kg
		Sheets in standard dimensions e.g. 1,000 x 2,000 mm		
	Plate	Thickness	9.5 .. 150	mm
		Width	≤ 4.500	mm
		Length	≤ 15.000	mm
		Weight	≤ 8.000	kg
	Disc	Thickness	0.3 .. 150	mm
		Diameter	20 .. 3.100	mm
		Weight	≤ 10.000	kg

* Some combinations might not be possible

Surface coatings & Special Treatments *		Dimension	
	Hot-Dip tinned and STOL®28M Tin-Silver STOL®13 Thermic Sn	Width Thickness Tin Layer Thickness	≤ 330 mm ≤ 1.5 mm 0.4 .. 20 μm
	Different thickness per side possible		
	Electroplating	Width Thickness	≤ 400 mm ≤ 2.5 mm
	Tin, Silver, Gold, Cu-Flash, Ni-Flash, Selective plating	Other coatings on request	
	Profiled strips STOL®Multigauge	Width Thickness	15 .. 90 mm 0.23 .. 1 mm
	Other width on request		
	Surface with extra low residual carbon content possible.		
	Protection with oil or adhesive foil on request		

* Further details you find at www.kme.com

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