

Alloy Designation	STOL® 75
EN	-
DIN CEN/TS 13388	-
UNS	C18070

Chemical Composition		
Weight percentage		
Cu #) ##)	99,0	%
Cr	0.15 .. 0,40	%
Si	0.02 .. 0.07	%
Ti	0,01 .. 0,40	%

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

#) Cu value includes Ag

##) Cu + Sum of Named Elements 99,8 % min.



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
STOL® 75 is a CuCrSiTi alloy that can be hardened by cold forming and by precipitation during a heat treatment. This alloy provides a good combination of high electrical conductivity, good strength, good bendability, excellent hot and cold forming properties and a good corrosion resistance.
Due to the Precipitations the relaxation properties, even at temperatures up to 200°C are excellent.

Main Applications
Automotive Switches and Relays, Contacts, Connectors, Terminals, Press fits, Hybrid Cars
Electrical Switches and Relays, Contacts, Connectors, Terminals, Press fits, Components for the electrical industry, Stamped parts, Semiconductor Components, Junction Boxes, Photovoltaic Systems

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

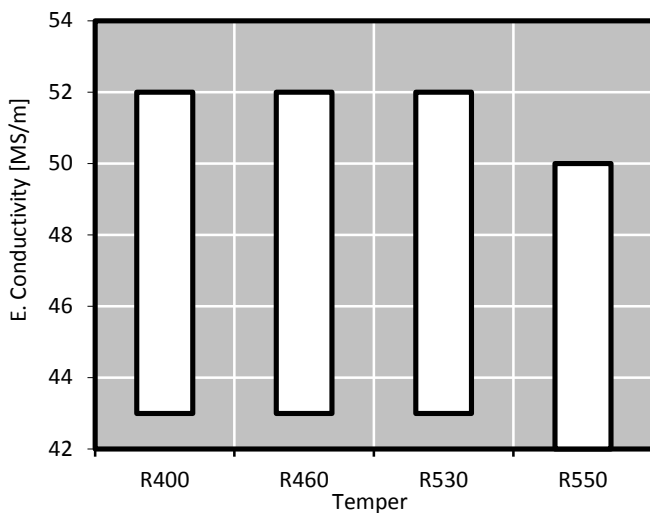
x = well suited xx = particularly well suited

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	0.38	J/(g·K)
Thermal conductivity	310	W/(m·K)
Electrical conductivity (1 MS/m = 1 m/(Ω mm ²))	45	MS/m
Electrical conductivity (IACS)	78	%
Thermal coefficient of electrical resistance (0 .. 100 °C)	3	10 ⁻³ /K
Modulus of elasticity (1 GPa = 1 kN/mm ²) cold formed	138	GPa

Mechanical Properties				
Temper	Tensile Strength	Yield Strength Minimum	Elongation Minimum	Hardness
	Rm	Rp _{0.2}	A _{50mm}	HV *
	MPa	MPa	%	HV
R400	400 .. 480	300	8	120 .. 150
R460	160 .. 560	400	9	140 .. 170
R530	530 .. 610	460	10	150 .. 190
R550	550 .. 630	520	10	150 .. 190

*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.

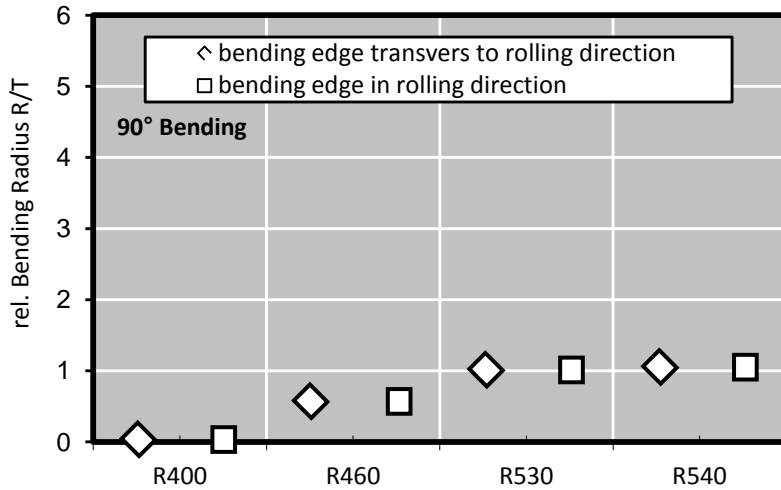
Fabrication Properties*	
Cold Forming Properties	Good
Machinability (Rating 20)	Less suitable
Electroplating Properties	Good
Hot Tinning Properties	Good
Soft Soldering, Brazing	Good
Resistance Welding	Less suitable
Gas Shielded Welding	Excellent
Laser Welding	Fair

* For more details call our technical service

Corrosion Resistance*
STOL® 75 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

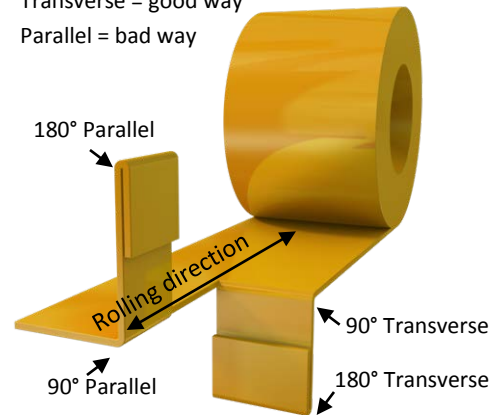


Bending test according to EN ISO 7438 is done with 10 mm wide samples. Smaller samples in general – as well as lower thickness – allow a lower bending radius without cracks. If needed we supply bending optimized temper classes that far exceed standard quality.

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

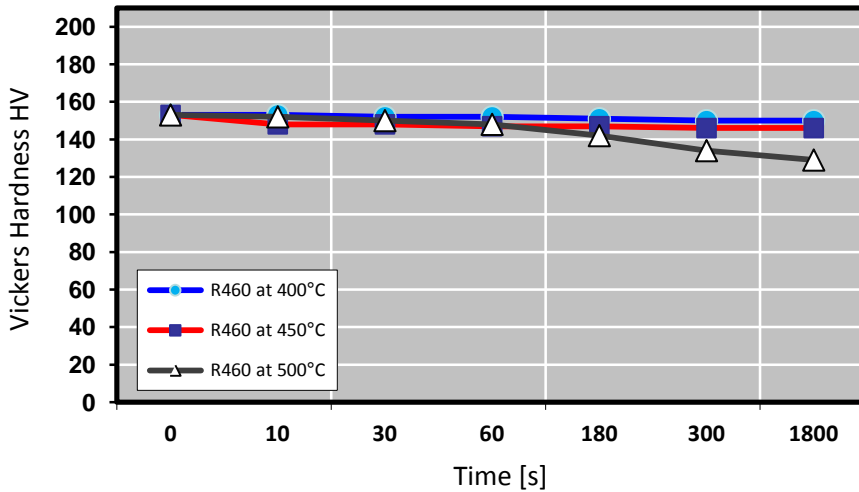
$$\text{Minimum radius} = (R/T) \times \text{thickness} \\ = 0.5 \times 0.3 \text{ mm} = 0.15 \text{ mm}$$

Bending Properties *			
Temper	Thickness Range	Bending 90°	
		Transversers	Parallel
	mm	R/T	R/T
R400	≤ 0.5	0	0
R460	≤ 0.5	0,5	0,5
R530	≤ 0.5	1	1
R550	≤ 0.5	1	1

* Measured at sample width 10 mm according to EN 1654

Possible bending radius = (R/T) x thickness

Softening Resistance



After short time heat treatment Vickers Hardness is measured. The diagram shows typical values.

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