C51000 (CuSn5)

18 08 US

Comparable standards: UNS C51000 ● EN CW451K ● JIS C5102

Aurubis designations: C510 ● PNA285

Description

CuSn5 with a nominal composition of 95% copper and 5% tin offers an optimum combination of engineering properties as high strength and ductility, superior fatigue and spring characteristics, excellent corrosion resistance, durability for severe service, good bearing qualities with low friction and high wear resistance, superior forming, deep drawing and spinning, resistance to stress relaxation and good joining properties. In most cases CuSn5 has adequate electrical and thermal properties for many current-carrying and heat transfer requirements.

Composition

Cu* [%]	Sn [%]	Zn [%]	Fe [%]	P [%]	Pb [%]
rem.	4.5 – 5.8	0.30 max	0.10 max	0,03-0,35	0.05 max

*) Cu + sum of named elements min 99.5 %

Physical properties

Melting point [°F] [°C]	Density [lb/in³] [g/cm³]	Specific heat cap. at 20°C [Btu/lb°F] [kJ/kgK]	Electrical cond. [%IACS] [MS/m]	Thermal cond. at 20°C [Btu/ft h °F] [W/mK]	Mod. of elasticity x1000 ksi [GPa]	Coef. of therm exp. at 20°C [10⁻⁶/°F] [10⁻⁶/K]
1920 1049	0.32 8.86	0.09 0.38	15 9	40 96	16 110	9.9 17.9

The specified conductivity applies to the soft condition only

Mechanical properties

Temper	Tensile strength Rm [ksi] [MPa]	Yield strength Rp0.2 nominal [ksi] [MPa]	Elon-gation 2" nominal [%]	Hard-ness nominal HR30T HV	min bend ratio 90°		min. bend ratio 180°	
					GW	BW	GW	BW
Soft	45-56 310-386	24 166	55	 85	0.0	0.0	0.0	0.0
H02 (1/2H)	58-73 400-504	51 352	32	69 145	0.0	0.0	0.0	0.0
H04 (H)	76-91 524-626	77 531	7	75 200	0.0	1.0	0.0	1.0
H06 (EH)	88-103 607-710	90 621	5	78 230	0.0	2.0	0.0	2.0
H08 (SH)	95-110 655-759	98 676	2	79 245				
H10 (ES)	100-114 690-786	102 704	1	80 250				

Other tempers are available upon request.
GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction

Fabrication properties

Cold formability	excellent
Hot formability	poor
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	fair
Gas shield arc welding	good
Resistance welding	good

Stress relaxation resistance

Typical temperature for min 70 % remaining stress after 3000 h: 125 ºC

Typical uses

Bridge bearing plates, bellows, diaphragms, clutch discs, fasteners, mechanical springs, electrical contacts, switches, connectors, chemical hardware, textile machinery parts, fuse clip, lock washers, sleeve bushing, perforated sheets, friction springs, wear guides, sprinkler parts

Applicable Spcifications

ASTM B103, B888