

C12200 (Cu-DHP)

Comparable standards: UNS C12200 • EN CW024A • JIS C1221
 Aurubis designations: C122 • PNA219

Description Phosphorus-Deoxidized Copper – Cu-DHP with a nominal composition of 99.9 % minimum copper and 0.02 % phosphorus is the most widely used copper for tube and pipe but also finds widespread use for sheet and strip items. Cu-DHP exhibits better ductility than Cu-ETP and is adaptable for progressive drawing operations requiring few or no intermediate anneals. A major advantage of Cu-DHP is the freedom from hydrogen embrittlement susceptibility in reducing atmospheres. This advantage is utilized in the cladding of steel and subsequent reducing atmosphere anneals without incurring the embrittlement, which occurs when cladding with Cu-ETP. The electrical and thermal conductivity are lower when compared with Cu-ETP but adequate for many applications as exemplified by a major use of strip to produce air conditioning and refrigeration tubing by gas shielding arc welding techniques.

Composition

Cu*	P
[%]	[%]
99.9 min	0.015-0.040

*) Incl. Ag

Physical properties

Melting point	Density	Specific heat cap. at 20°C	Electrical cond.	Thermal cond. at 20°C	Mod. of elasticity	Coef. of therm exp. at 20°C
[°F] [°C]	[lb/in ³] [g/cm ³]	[Btu/lb°F] [kJ/kgK]	[%IACS] [MS/m]	[Btu/ft h °F] [W/mK]	x1000 ksi [GPa]	[10 ⁻⁶ /°F] [10 ⁻⁶ /K]
1981 1083	0.323 8.9	0.092 0.394	85 50	196 339	17 117	9.8 17.6

The specified conductivity applies to the soft condition only

Mechanical properties

	Tensile strength Rm	Yield strength Rp0.2 nominal	Elongation 2" nominal	Hard-ness nominal HR30T HV	min bend ratio 90°		min. bend ratio 180°	
	[ksi] [MPa]	[ksi] [MPa]	[%]		GW	BW	GW	BW
Soft	26-38 179-262	10 69	35		0.0	0.0	0.0	0.0
H02 (1/2H)	37-46 255-317	37 255	20	50 90	0.0	0.5	0.0	1.0
H04 (H)	43-52 297-359	45 310	8	58 100	1.0	2.0	2.0	3.0
H06 (EH)	47-56 324-386	50 349	3	60 105	2.0	3.0	2.5	
H08 (SH)	50-58 345-400	52 359	3	63 110	3.0		4.0	
H10 (ES)	52 min 359 min	54 373	2	61 min 112 min				

Other tempers are available upon request.

GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction

**Fabrication
properties**

Electrical and thermal conductivity	excellent
Corrosion resistance	excellent
Formability	excellent
Weldability	excellent

Typical uses

Strips for welded tube, cladding of steel and stainless steel, chemical process equipment, vats, kettles, pans, ice trays, pots, cooking utensils, deep drawn copper items, plaques, medallions and emblems

**Applicable
specifications**

ASTM B152, B370, ASME SB152