



MATERIAL SAFETY DATA SHEET

IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION HAZARD COMMUNICATION STANDARD #29 C.F.R. 1910.1200

SECTION I – PRODUCT DESCRIPTION – Copper Alloy COMMON NAME / GRADE - U.N.S Number: C11000

SECTION II – HAZARDOUS INGREDIENTS

BASE METAL, ALLOYING ELEMENTS, METALLIC COATING	% COMPOSITION BY WEIGHT (a)	CAS #	ACGIH TLV (mg/m ³) (b)
Copper (Cu)	99.90 Min		

(a) % of alloying materials varies with grade of material – (b) 1965-1966 ACGIH threshold limit value.

PHYSICAL PROPERTIES	METRIC	ENGLISH	COMMENT
DENSITY		0.322Lb/cu.in.	
MECHANICAL PROPERTIES (measure d at 68 F (20 C))	METRIC	ENGLISH	
Hardness, Wickers	75-90	75-90	½ hard
Hardness, Wickers	90-105	90-105	full hard
Tensile Strength, Ultimate	221-455 MPa	32100-66000 psi	Varies with heat treatment
Tensile Strength, Yield	69-365 MPa	10000-52900 psi	Varies widely with heat treatment
Elongation at Break	55%	55%	in 101.6 mm (4 in.)
Modulus of Elasticity	115 GPa	16700 ksi	
Poisson's Ratio	0.31	0.31	
Mechanability	20%	20%	
Shear Modulus	44 GPa	6380 KSI	

ELECTRICAL PROPERTIES	METRIC	ENGLISH	COMMENT
Electrical Resistivity	1.71e-006 ohm-cm	1.71e-006 ohm-cm	at 20° C (68°F)

THERMAL PROPERTIES	METRIC	ENGLISH	COMMENT
CTE, linear 20°C	17µm/m-°C	9.44in/in-°F	from 20-100°C (68-212°F)
CTE, linear 100°C	17.3µm/m-°C	9.61in/in-°F	from 20-200°C (68-390°F)
CTE, linear 250°C	17.7µm/m-°C	9.83in/in-°F	from 20-300°C (68-570°F)
Specific Heat Capacity	0.385J/g-°C	0.092 BTU/lb-°F	at 20°C (68°F)
Thermal Conductivity	383-391 W/m-k	2660-2710 BTU/in/hr-ft ² -°F	

SECTION III – PHYSICAL DATA

Material is (at normal conditions) – Solid	Appearance and Odor – Odorless
Melting Point (Base Metal) – 1981° F (1083°C)	Specific Gravity -

SECTION IV – HEALTH HAZARD DATA

Steel products in the natural state do not represent an inhalation, ingestion, or contact hazard. However, operations such as burning, welding, sawing, brazing, and grinding may release fumes and/or dust, which may present health hazard.

SECTION V – REACTIVITY DATA

Stability – Stable	Incompatibility (Material to avoid) -
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SECTION VI – SPECIAL PROTECTION INFORMATION

Local exhaust ventilation should be utilized when welding, burning, grinding, or machining, NIOSH/MSHA approved dust and fume respirator should be used to avoid excessive inhalation of particulates, when exposure exceeds TLV's. Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.