

CDA COPPER NO. C 116 00

SilverCopper Tough Pitch

Composition—Percent

	Nominal	Minimum	Maximum
Copper + Silver	—	99.90	—
Silver	—	25 oz./ton*	—
Oxygen	.04	—	—

*1 Troy ounce per avoirdupois ton = 0.0034%

Typical Uses

AUTOMOTIVE: Gaskets, radiators, heat exchangers
ELECTRICAL: Bus bars, circuit boards, lead frames, conductivity wire, contacts, radio parts, windings, switches and switch gear, terminals, commutator segments
MISCELLANEOUS: Chemical process equipment, printing rolls, clad metals, printed circuit foil

Common Fabrication Processes

Blanking, coining, coppersmithing, drawing, etching, forming and bending, heading and upsetting, hot forging and pressing, piercing and punching, roll threading and knurling, shearing, spinning, squeezing and swaging, stamping

Physical Properties

	English Units	C.G.S. Units
Melting Point (Liquidus)	1980°F.	1082°C.
Melting Point (Solidus)		
Density	.321-.323 lb./cu. in. @ 68°F.	8.89-8.94 gm./cu. cm. @ 20°C.
Specific Gravity	8.89-8.94	8.89-8.94
Coefficient of Thermal Expansion	.0000098 per °F. from 68°F. to 572°F.	.0000177 per °C. from 20°C. to 300°C.
Thermal Conductivity	224 Btu./sq. ft./ft./hr./°F. @ 68°F.	.927 cal./sq. cm./cm./sec./°C. @ 20°C.
Electrical Resistivity (Annealed)	10.4 Ohms (circ. mil./ft.) @ 68°F.	1.72 Microhm-cm. @ 20°C.
Electrical Conductivity* (Annealed)	100% IACS @ 68°F.	.580 Megohm-cm. @ 20°C.
Thermal Capacity (Specific Heat)	.092 Btu./lb./°F. @ 68°F.	.092 cal./gm./°C. @ 20°C.
Modulus of Elasticity (Tension)	17,000,000 psi	12,000 Kg./sq. mm.
Modulus of Rigidity	6,400,000 psi	4,500 Kg./sq. mm.

*Volume basis

Fabrication Properties

Capacity for being Cold Worked Excellent
 Capacity for being Hot Formed Excellent
 Hot Forgeability Rating (Forging Brass = 100) 65
 Hot Working Temperature 1400-1600°F. or 750-875°C.
 Annealing Temperature 700-1400°F. or 375-750°C.
 Machinability Rating (Free Cutting Brass = 100) 20

Suitability for being joined by:
 Soldering Excellent
 Brazing Good
 Oxyacetylene Welding Not Recommended
 Carbon Arc Welding Fair
 Gas Shielded Arc Welding Fair
 Coated Metal Arc Welding Not Recommended
 Resistance Welding { Spot Not Recommended
 Seam Not Recommended
 Butt Good

Mechanical Properties

Form	Size Section	Temper	Tensile Strength psi	Yield Strength (½% Extension Under Load) psi	Reduction of Area %	Elongation in 2" %	Rockwell Hardness			Shear Strength psi	Fatigue Strength		
							F	B	30T		psi	Million Cycles	
FLAT PRODUCTS	0.040 in.	0.025 mm	34,000	11,000	—	45	45	—	—	23,000	—	—	
		Eighth Hard	36,000	28,000	—	30	60	10	25	25,000	—	—	
		Quarter Hard	38,000	30,000	—	25	70	25	36	25,000	—	—	
		Half Hard	42,000	36,000	—	14	84	40	50	26,000	—	—	
		Hard	50,000	45,000	—	6	90	50	57	28,000	—	—	
		Spring	55,000	50,000	—	4	94	60	63	29,000	—	—	
		Extra Spring	57,000	53,000	—	4	95	62	64	29,000	—	—	
		As Hot Rolled	34,000	10,000	—	45	45	—	—	23,000	—	—	
		0.050 mm	32,000	10,000	—	50	40	—	—	22,000	—	—	
	0.250 in.	Eighth Hard	36,000	28,000	—	40	60	10	—	25,000	—	—	
		Quarter Hard	38,000	30,000	—	35	70	25	—	25,000	—	—	
		Hard	50,000	45,000	—	12	90	50	—	28,000	—	—	
		As Hot Rolled	32,000	10,000	—	50	40	—	—	22,000	—	—	
		1.0 in.	Hard	45,000	40,000	—	20	85	45	—	26,000	—	—

The values listed above represent reasonable approximations suitable for general engineering use. Due to commercial variations in composition and to manufacturing limitations, they should not be used for specification purposes. See applicable A.S.T.M. specification references.