

CDA COPPER ALLOY NO. C 710 00

Copper Nickel, 20%

Composition—Percent

	Nominal	Minimum	Maximum
Copper (incl. Silver)	79	Remainder	Remainder
Lead	—	—	.05
Iron	—	—	1.0
Zinc	—	—	1.0
Nickel	21	19.0	23.0
Manganese	—	—	1.0

Nearest Applicable ASTM Specifications	
Bolts	F468
Flat Products	B122
Nuts	F467
Pipe	B466, B467
Rod	
Screws	F468
Shapes	
Studs	F468
Tube	B111, B359, B395, B466, B467
Wire	B206

Physical Properties

	English Units	C.G.S. Units
Melting Point (Liquidus)	2190°F.	1200°C.
Melting Point (Solidus)	2100°F.	1150°C.
Density	.323 lb./cu. in. @ 68°F.	8.94 gm./cu. cm. @ 20°C.
Specific Gravity	8.94	8.94
Coefficient of Thermal Expansion	per °F. from 68°F. to 212°F.	per °C. from 20°C. to 100°C.
Coefficient of Thermal Expansion	per °F. from 68°F. to 392°F.	per °C. from 20°C. to 200°C.
Coefficient of Thermal Expansion	.0000091 per °F. from 68°F. to 572°F.	.0000164 per °C. from 20°C. to 300°C.
Thermal Conductivity	21 Btu./sq. ft./ft./hr./°F. @ 68°F.	.09 cal./sq. cm./cm./sec./°C. @ 20°C.
Electrical Resistivity (Annealed)	160 Ohms (circ. mil./ft.) @ 68°F.	26.6 Microhm-cm. @ 20°C.
Electrical Conductivity* (Annealed)	6.5% IACS @ 68°F.	.038 Megohm-cm. @ 20°C.
Thermal Capacity (Specific Heat)	.09 Btu./lb./°F. @ 68°F.	.09 cal./gm./°C. @ 20°C.
Modulus of Elasticity (Tension)	20,000 ksi	14,100 Kg./sq. mm.
Modulus of Rigidity	7,500 ksi	5,275 Kg./sq. mm.

*Volume basis

Typical Uses

Communication relays, condensers, condenser plates, electrical springs, evaporator and heat exchanger tubes, ferrules, resistors

Common Fabrication Processes

Blanking, forming and bending, welding

Fabrication Properties

Capacity for being Cold Worked Good
 Capacity for being Hot Formed Good
 Hot Forgeability Rating (Forging Brass = 100) —
 Hot Working Temperature 1600-1900°F. or 875-1050°C.
 Annealing Temperature 1200-1500°F. or 650-825°C.
 Machinability Rating (Free Cutting Brass = 100) 20

Suitability for being joined by:

Soldering Excellent
 Brazing Excellent
 Oxyacetylene Welding Fair
 Gas Shielded Arc Welding Excellent
 Coated Metal Arc Welding Good
 Resistance Welding { Spot Excellent
 Seam Excellent
 Butt Excellent

Mechanical Properties

Form	Size Section in.	Temper	Tensile Strength ksi	Yield Strength		Elongation in 2" %	Rockwell Hardness			Shear Strength ksi	Fatigue Strength	
				(.5% Ext. Under Load) ksi	(.2% Offset) ksi		F	B	30T		ksi	Million Cycles
FLAT PRODUCTS	.040 in.	.050 mm.	51.0	13.0	13.0	35	72	25	—	—	—	—
		.035 mm	52.0	14.0	14.0	35	73	27	—	—	—	—
		.025 mm.	53.0	16.0	16.0	35	75	30	—	—	—	—
		Quarter Hard	60.0	48.0	49.0	20	92	58	—	—	—	—
		Half Hard	68.0	62.0	63.0	8	100	75	—	—	—	—
		Hard	75.0	71.0	72.0	5	—	80	—	—	—	—
		Extra Hard	78.0	75.0	76.0	4	—	82	—	—	—	—
		Spring	82.0	78.0	79.0	3	—	84	—	—	—	—
		Extra Spring	85.0	78.0	79.0	3	—	86	—	—	—	—
		TUBE	1.0 in. OD x .065 in.	.025 mm.	49.0	18.0	—	40	72	—	—	—
WIRE	.080 in.	Light Drawn	68.0	62.0	—	14	—	76	—	—	20.0	100
		Extra Spring	95.0	85.0	—	5	—	—	—	—	—	—

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.