

**Typical Uses**

**AUTOMOTIVE:** Gaskets, radiators, heat exchangers  
**ELECTRICAL:** Bus bars, circuit boards, 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

**Composition—Percent**

	Nominal	Minimum	Maximum
Copper + Silver	—	99.90	—
Silver	—	16 oz./ton*	—
Oxygen	.04	—	—

\*1 Troy ounce per avoirdupois ton = 0.0034%

**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  
 Oxycetylene 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	—	—
	0.250 in.	As Hot Rolled	34,000	10,000	—	45	45	—	—	23,000	—	—
		0.050 mm	32,000	10,000	—	50	40	—	—	22,000	—	—
		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	—	—
		Hard	45,000	40,000	—	20	85	45	—	26,000	—	—
	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.