

**Typical Uses**

**INDUSTRIAL:** Condensers, condenser plates, ferrules, welded tubing for evaporators, heat exchangers, distillers and salt water piping, ship hull plates

**Composition—Percent**

	Nominal	Minimum	Maximum
Copper	88.6	—	—
Lead	—	—	.02
Iron	1.4	1.0	1.8
Zinc	—	—	0.5
Nickel	10.0	9.0	11.0
Manganese	—	—	1.0
Phosphorus	—	—	.02
Sulphur	—	—	.02
Carbon	—	—	.05
Copper plus sum of named elements	—	99.5	—

**Common Fabrication Processes**

Forming and bending, welding, drawing, shearing, stamping

**Physical Properties**

	English Units	C.G.S. Units
Melting Point (Liquidus)	2100°F.	1150°C.
Melting Point (Solidus)	2010°F	1100°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	.0000095 per °F. from 68°F. to 572°F.	.0000171 per °C. from 20°C. to 300°C.
Thermal Conductivity	26 Btu./sq. ft./ft./hr./°F. @ 68°F.	.11 cal./sq. cm./cm./sec./°C. @ 20°C.
Electrical Resistivity (Annealed)	115 Ohms (circ. mil./ft.) @ 68°F.	19.1 Microhm-cm. @ 20°C.
Electrical Conductivity* (Annealed)	9.0% IACS @ 68°F.	.0522 Megohm-cm. @ 20°C.
Thermal Capacity (Specific Heat)	.09 Btu./lb./°F. @ 68°F.	.09 cal./gm./°C. @ 20°C.
Modulus of Elasticity (Tension)	18,000,000 psi	12,700 Kg./sq. mm.
Modulus of Rigidity	6,800,000 psi	4,800 Kg./sq. mm.

\*Volume basis

**Fabrication Properties**

Capacity for being Cold Worked . . . . . Good  
 Capacity for being Hot Formed . . . . . Good  
 Hot Forgeability Rating (Forging Brass = 100) . . . . . —  
 Hot Working Temperature . . . . . 1550-1750°F. or 850-950°C.  
 Annealing Temperature . . . . . 1100-1500°F. or 600-825°C.  
 Machinability Rating (Free Cutting Brass = 100) . . . . . 20

Suitability for being joined by:

Soldering . . . . . Excellent  
 Brazing . . . . . Excellent  
 Oxyacetylene Welding . . . . . Fair  
 Carbon Arc Welding . . . . . Not Recommended  
 Gas Shielded Arc Welding . . . . . Excellent  
 Coated Metal Arc Welding . . . . . Good  
 Resistance Welding { Spot . . . . . Good  
 Seam . . . . . Good  
 Butt . . . . . Excellent

**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
STRIP	0.050 in.	0.025 mm Half Hard	44,000	16,000	—	42	65	15	26	—	—	—
			60,000	57,000	—	10	100	72	70	—	—	—

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.