

COPPER ALLOY No. C71500 (COPPER NICKEL, 30%)

Composition — percent

	Nominal	Minimum	Maximum
Copper (incl. Silver)	69.5	Remainder	
Lead	.....	.....	.05*
Iron	.5	.40	1.0
Zinc	.....	.....	1.0*
Nickel	30	29.0	33.0
Manganese	.....	.....	1.0

*When the product is for subsequent welding applications and so specified by the purchaser, Zn shall be .50% max., Pb .02% max., P .02% max., Sulfur .02% max. and Carbon .05% max.

Nearest Applicable A S T M Specifications

Bolts	F468
Flat Products	B122, B151, B171, B402, B432
Nuts	F467
Pipe	B466, B467, B608
Rod	B151
Screws	F468
Shapes	
Studs	F468
Tube	B111, B359, B395, B466, B467, B543, B552
Wire	

Physical Properties

	English Units	C. G. S. Units
Melting Point (Liquidus)	2260 F	1240 C
Melting Point (Solidus)	2140 F	1170 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	.0000090 per °F from 68 F to 572 F	.0000162 per °C from 20 C to 300 C
Thermal Conductivity	17 Btu/sq ft/ft/hr/°F @ 68 F	.07 cal/sq cm/cm/sec/°C @ 20 C
Electrical Resistivity (Annealed)	225 Ohms (circ mil/ft) @ 68 F	37.5 Microhm-cm @ 20 C
Electrical Conductivity* (Annealed)	4.6 % IACS @ 68 F	.0267 Meghm-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu/lb °F @ 68 F	.09 cal/gm °C @ 20 C
Modulus of Elasticity (Tension)	22,000 ksi	15,500 Kg/sq mm
Modulus of Rigidity	8,300 ksi	5,800 Kg/sq mm

* Volume Basis

Typical Uses

INDUSTRIAL: condensers, condenser plates, distiller tubes, evaporator and heat exchanger tubes, ferrules, salt water piping

Common Fabrication Processes

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	1700-1900 F or 925-1050 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	Good
Gas Shielded Arc Welding	Excellent
Coated Metal Arc Welding	Excellent
Resistance Welding	
Spot	Excellent
Seam	Excellent
Butt	Excellent

Forms and Tempers Most Commonly Used

Forms and Tempers Most Commonly Used	Annealed Tempers						Rolled or Drawn Tempers						Hot Finished Tempers										
	Nominal Grain Size mm																						
	.100 (OS100)	.070 (OS070)	.050 (OS050)	.035 (OS035)	.025 (OS025)	.015 (OS015)	Soft Anneal (O60)	Light Anneal (O60)	Eight Hard (H00)	Quarter Hard (H01)	Half Hard (H02)	Three Quarter Hard (H03)	Hard (H04)	Extra Hard (H06)	Spring (H08)	Extra Spring (H10)	Drawn — General Purpose (H58)	Hard Drawn (H80)	Light Drawn — Bending (H55)	As Hot Rolled (M20)	As Extruded (M30)	Special Tempers	
FLAT PRODUCTS																							
Strip, Rolled																							
Strip, Drawn																							
Flat Wire, Rolled																							
Flat Wire, Drawn																							
Bar, Rolled																							
Bar, Drawn																							
Sheet																							
Plate																							
ROD																							
WIRE																							
TUBE																							
PIPE																							
SHAPES																							

DRAWN—GENERAL PURPOSE (H58) temper is used for general purpose tube only, usually where there is no real requirement for high strength or hardness on the one hand or for bending qualities on the other.

HARD DRAWN (H80) temper is used only where there is need for a tube as hard or as strong as is commercially feasible for the size in question.

LIGHT DRAWN—BENDING (H55) temper is used only where a tube of some stiffness, but yet capable of readily being bent (or otherwise moderately cold worked) is needed.

Mechanical Properties

Form	Size Section in.	Temper	Tensile Strength ksi	Yield Strength (1.5% Ext. under Load)		Elongation in 2 in. %	Rockwell Hardness	Shear Strength ksi	Fatigue Strength	
				ksi	ksi				ksi	Million Cycles
FLAT PRODUCTS	1.0 in.	As Hot Rolled	55.0	20.0	.....	45	— 35 —	.....	.....	.....
TUBE	1.0 in. OD X .065 in	.025 mm	60.0	25.0	.....	45	80 45 —	.....	.....	.....
	4.5 in. OD X .109 in	.035 mm	54.0	.....	.....	45	77 36 —	.....	.....	.....
ROD	1.0 in.	Half Hard (20%)	75.0	70.0	.....	15	— 80 —	.....	.....	.....

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.