

COPPER ALLOY No. C 74000 NICKEL SILVER

Composition — percent

	Nominal	Minimum	Maximum
Copper	71	69.0	73.5
Lead	.....	.....	.10*
Iron	.....	.....	.25
Zinc	25	Remainder	.....
Nickel	10	9.0	11.0
Manganese	.....	.....	.50

*In the case of rod and wire, maximum lead is .05%.

Nearest Applicable A S T M Specifications

Flat Products	B122, B151
Pipe	
Rod	B151
Shapes	
Tube	
Wire	B206

Physical Properties

	English Units	C. G. S. Units
Melting Point (Liquidus)	1870 F	1020 C
Melting Point (Solidus)	F	C
Density	.314 lb /cu in @ 68 F	8.69 gm /cu cm @ 20 C.
Specific Gravity	8.69	8.69
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	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	19.2 Microhm-cm @ 20 C
Electrical Conductivity* (Annealed)	9.0 % IACS @ 68 F	.0522 Megmho-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu /lb °F @ 68 F	.09 cal /gm °C @ 20 C
Modulus of Elasticity (Tension)	17,500 ksi	12,300 Kg /sq mm
Modulus of Rigidity	6,600 ksi	4,600 Kg /sq mm

* Volume Basis

Typical Uses

HARDWARE: rivets, screws, slide fasteners
OPTICAL GOODS: optical parts
MISCELLANEOUS: etching stock, hollow ware, name plates, platers' bars

Common Fabrication Processes

Blanking, drawing, etching, forming and bending,
 heading and upsetting, roll threading and knur-
 ing, shearing, spinning, squeezing and swaging

Fabrication Properties

Capacity for Being Cold Worked Excellent
 Capacity for Being Hot Formed Poor
 Hot Forgeability Rating (Forging Brass = 100)
 Hot Working Temperature F or C
 Annealing Temperature 1100-1400 F or 600-750 C
 Machinability Rating (Free Cutting Brass = 100) 20

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

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 (08100)	.070 (08070)	.050 (08050)	.035 (08035)	.025 (08025)	.015 (08015)	Soft Anneal (080)	Light Anneal (080)	Eight Hard (H08)	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 a 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 (5% Ext. under Load) (2% Offset) ksi		Elongation in 2 in. %	Rockwell Hardness			Shear Strength ksi	Fatigue Strength ksi	Million Cycles
				F	B		30T					
FLAT PRODUCTS	.040 in.	.070 mm	49.0	18.0	.....	49	67	22	30	.....	.....	.....
		.050 mm	51.0	19.0	.....	46	71	28	34	.....	.....	.....
		.035 mm	53.0	20.0	.....	43	76	35	38	41.0	.....	.....
		.025 mm	56.0	23.0	.....	40	80	42	44	.....	.....	.....
		.015 mm	60.0	28.0	.....	36	85	52	51	.....	.....	.....
		Eight Hard	60.0	35.0	.....	34	60	55	43.0	.....	.....	.....
		Quarter Hard	65.0	45.0	.....	25	70	63	45.0	.....	.....	.....
		Half Hard	73.0	60.0	.....	12	80	70	50.0	.....	.....	.....
		Hard	86.0	75.0	.....	4	89	76	55.0	.....	.....	.....
		Extra Hard	95.0	76.0	.....	3	92	78	59.0	.....	.....	.....
WIRE	.080 in.	.070 mm	50.0	.....	.....	50	.....	.....	.....	.....	.....	.....
		.050 mm	52.0	.....	.....	48	.....	.....	.....	.....	.....	.....
		.035 mm	56.0	.....	.....	45	.....	.....	.....	.....	.....	.....
		.025 mm	58.0	.....	.....	40	.....	.....	.....	.....	.....	.....
		.015 mm	63.0	.....	.....	35	.....	.....	.....	.....	.....	.....
		Eight Hard (10%)	65.0	.....	.....	25	.....	.....	.....	.....	.....	.....
		Quarter Hard (20%)	72.0	.....	.....	10	.....	.....	.....	.....	.....	.....
		Half Hard (37%)	85.0	.....	.....	7	.....	.....	.....	.....	.....	.....
		Hard (60%)	105.0	.....	.....	5	.....	.....	.....	.....	.....	.....
		Extra Hard (75%)	120.0	.....	.....	3	.....	.....	.....	.....	.....	.....
Spring (84%)	130.0	.....	.....	1	.....	.....	.....	.....	.....	.....

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.