

COPPER ALLOY Nos. C34200 (HIGH LEADED BRASS, 64 1/2%) and C35300 (HIGH LEADED BRASS, 62%)

Composition — percent

	Copper Alloy No. C34200			Copper Alloy No. C35300		
	Nominal	Minimum	Maximum	Nominal	Minimum	Maximum
Copper	63.5	62	65	61.5	60.0*	63.0
Lead	2	1.5	2.5	2.8	1.5	2.5
Iron	.....	.....	0.10	.....	.....	.10
Zinc	34.5	Remainder		36.5	Remainder	

*Copper, 61.0% minimum for rod

Nearest Applicable A S T M Specifications

Flat Products	B121
Pipe	
Rod	B453
Shapes	
Tube	
Wire	

Physical Properties

	English Units	C. G. S. Units
Melting Point (Liquidus)	1670 F	910 C
Melting Point (Solidus)	1630 F	885 C
Density	.306 lb /cu in @ 68 F	8.47 gm /cu cm @ 20 C.
Specific Gravity	8.47	8.47
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	.000113 per °F from 68 F to 572 F	.000203 per °C from 20 C to 300 C
Thermal Conductivity	67 Btu /sq ft /ft /hr /°F @ 68 F	.28 cal /sq cm /cm /sec /°C @ 20 C
Electrical Resistivity (Annealed)	39.9 Ohms (circ mil /ft) @ 68 F	6.63 Microhm-cm @ 20 C
Electrical Conductivity* (Annealed)	26 % IACS @ 68 F	.151 Meghm-cm @ 20 C
Thermal Capacity (Specific Heat)	.09 Btu /lb °F @ 68 F	.09 cal /gm °C @ 20 C
Modulus of Elasticity (Tension)	15,000 ksi	10,500 Kg /sq mm
Modulus of Rigidity	5,600 ksi	3,900 Kg /sq mm

* Volume Basis

Typical Uses

HARDWARE: clock plates and nuts, clock and watch parts, gears, wheels
INDUSTRIAL: channel plate

Common Fabrication Processes

Blanking, machining, piercing and punching, roll threading and knurling, stamping

Fabrication Properties

Capacity for Being Cold Worked	Fair	Suitability for being joined by:	
Capacity for Being Hot Formed	Poor	Soldering	Excellent
Hot Forgeability Rating (Forging Brass = 100)		Brazing	Good
Hot Working Temperature	F or C	Oxyacetylene Welding	Not Recommended
Annealing Temperature	800-1100 F or 425-600 C	Gas Shielded Arc Welding	Not Recommended
Machinability Rating (Free Cutting Brass = 100)	90	Coated Metal Arc Welding	Not Recommended
		Resistance Welding { Spot	Not Recommended
		{ Seam	Not Recommended
		{ Butt	Fair

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)	Eighth 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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SHAPE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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	Yield Strength		Elongation in 2 in. %	Rockwell Hardness F | B | 30T	Shear Strength ksi	Fatigue Strength	
			ksi	(.5% Ext. under Load) ksi	(.2% Offset) ksi				ksi	Million Cycles
FLAT PRODUCTS	.040 in.	.035 mm	49.0	17.0	.....	52	68 — 31	34.0	.....	.....
		Quarter Hard	54.0	40.0	.....	38	— 55 54	36.0	.....	.....
		Half Hard	61.0	50.0	.....	20	— 70 65	40.0	.....	.....
		Hard	74.0	60.0	.....	7	— 80 69	43.0	.....	.....
		Extra Hard	85.0	62.0	.....	5	— 87 74	45.0	.....	.....
ROD	1.0 in.	Half Hard (20%)	58.0	45.0	.....	25	— 75 —	.....	.....	.....

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.