CDA356 (Extra High Leaded Brass)

Chemical Composition
(%max., unless shown as range or min.)

	Cu	Fe[1]	Pb	Zn
Min. /Max.	60.0-63.0	.15	2.0-3.0	Rem.
Nominal	61.5	-	2.5	36.0

(1) For flat products, the iron shall be .10% max.
Note: Cu + Sum of Named Elements, 99.5% min.

Applicable Specifications

Product	Specification
Bar	ASTM B121
Plate	ASTM B121
Rod	ASTM B453
Sheet	ASTM B121
Strip	ASTM B121

Common Fabrication Processes
Blanking, Machining, Piercing and Punching, Stamping

Fabrication Properties

Joining Technique	Suitability
Soldering	Excellent
Brazing	Good
Oxyacetylene Welding	Not Recommended
Gas Shielded Arc Welding	Not Recommended
Coated Metal Arc Welding	Not Recommended
Spot Weld	Not Recommended
Seam Weld	Not Recommended
Butt Weld	Fair
Capacity for Being Cold Worked	Poor
Capacity for Being Hot Formed	Fair
Machinability Rating	100

Thermal Properties

Treatment	Temp./Time - US	Temp./Time - SI
Annealing Minimum	800	427
Annealing Maximum	1100	594
Annealing Time		
Hot Works Minimum	1300	705
Hot Works Maximum	1450	788

Mechanical Properties (measured at room temperature, 68 F (20 C)

Temper	Section Size	Cold Work	Typ/ Min	Temp	Tensile Strength	Yield Strength (0.5% ext. under load)	Yield Strength (0.2% offset)	Yield Strength (0.05% offset)	El	Rockwell Hardness	Vickers Hard.	Brinell Hard.	Shear Strength	Fatigue Strength*	Izod Impact Strength
	in. mm.	%		F C	ksi MPa	ksi MPa	ksi MPa	ksi MPa	%	B C F 30T	500	500 3000	ksi MPa	ksi MPa	ft-lb J
Rod															
O60	<0.50	0	SMIN	68	46	16	-	-	20-	- - - -	-	- -	-	-	0.0
	<12.7			20	317	110	-	-	20-	- - - -	-	- -	-	-	0.0
Flat Products															
OS015	0.04	0	TYP	68	54	32	33	-	42	52- 86-	-	- -	-	-	0.0
	1			20	372	221	228	-	42	52- 86-	-	- -	-	-	0.0
H02	0.04	0	TYP	68	61	50	52	-	20	70- - 65	-	- -	-	-	0.0
	1			20	421	345	359	-	20	70- - 65	-	- -	-	-	0.0
Rod															
H01	1.375	0	SMIN	68	42	15	-	-	20-	- - - -	-	- -	-	-	0.0
	34.9			20	290	103	-	-	20-	- - - -	-	- -	-	-	0.0
H01	<0.50	0	SMIN	68	52	25	-	-	10-	- - - -	-	- -	-	-	0.0
	<12.7			20	358	172	-	-	10-	- - - -	-	- -	-	-	0.0
O60	1.375	0	SMIN	68	40	15	-	-	30-	- - - -	-	- -	-	-	0.0
	34.9			20	276	103	-	-	30-	- - - -	-	- -	-	-	0.0
Flat Products															
OS035	0.04	0	TYP	68	49	17	-	-	50-	- 68	31 -	- -	-	-	0.0
	1			20	338	117	-	-	50-	- 68	31 -	- -	-	-	0.0
H06	0.04	0	TYP	68	88	66	77	-	5	85- - -	-	- -	-	-	0.0
	1			20	607	455	531	-	5	85- - -	-	- -	-	-	0.0
Rod															
H02	<0.50	0	SMIN	68	57	25	-	-	7	- - - -	-	- -	-	-	0.0
	<12.7			20	393	172	-	-	7	- - - -	-	- -	-	-	0.0
Flat Products															
H04	0.04	0	TYP	68	74	65	68	-	8	81- - -	-	- -	-	-	0.0
	1			20	510	448	469	-	8	81- - -	-	- -	-	-	0.0
Rod															
H01	0.75	0	SMAX	68	62	-	-	-	-	- - - - -	-	- -	-	-	0.0
	19.1			20	427	-	-	-	-	- - - - -	-	- -	-	-	0.0
Flat Products															
H08	0.04	0	TYP	68	92	67	83	-	4	87- - -	-	- -	-	-	0.0
	1			20	634	462	572	-	4	87- - -	-	- -	-	-	0.0
Rod															
H02	<0.50	0	SMAX	68	80	-	-	-	-	- - - - -	-	- -	-	-	0.0
	<12.7			20	552	-	-	-	-	- - - - -	-	- -	-	-	0.0
H01	1.375	0	SMAX	68	62	-	-	-	-	- - - - -	-	- -	-	-	0.0
	34.9			20	427	-	-	-	-	- - - - -	-	- -	-	-	0.0
H01	<0.50	0	SMAX	68	65	-	-	-	-	- - - - -	-	- -	-	-	0.0
	<12.7			20	448	-	-	-	-	- - - - -	-	- -	-	-	0.0
H02	1.375	0	SMIN	68	50	20	-	-	15-	- - - -	-	- -	-	-	0.0
	34.9			20	345	138	-	-	15-	- - - -	-	- -	-	-	0.0
H02	0.75	0	SMAX	68	70	-	-	-	-	- - - - -	-	- -	-	-	0.0
	19.1			20	483	-	-	-	-	- - - - -	-	- -	-	-	0.0
H02	0.75	0	SMIN	68	55	25	-	-	10-	- - - -	-	- -	-	-	0.0
	19.1			20	378	172	-	-	10-	- - - -	-	- -	-	-	0.0
H01	0.75	0	SMIN	68	50	20	-	-	15-	- - - -	-	- -	-	-	0.0
	19.1			20	345	138	-	-	15-	- - - -	-	- -	-	-	0.0
Flat Products															
OS050	0.04	0	TYP	68	47	16	17	-	60	12- 62-	-	- -	-	-	0.0
	1			20	324	110	117	-	60	12- 62-	-	- -	-	-	0.0
Rod															
H02	1.375	0	SMAX	68	62	-	-	-	-	- - - - -	-	- -	-	-	0.0
	34.9			20	427	-	-	-	-	- - - - -	-	- -	-	-	0.0
O60	0.75	0	SMIN	68	44	15	-	-	25-	- - - -	-	- -	-	-	0.0
	19.1			20	303	101	-	-	25-	- - - -	-	- -	-	-	0.0
Flat Products															
H10	0.04	0	TYP	68	97	68	87	-	3	89- - -	-	- -	-	-	0.0
	1			20	669	469	600	-	3	89- - -	-	- -	-	-	0.0
H01	0.04	0	TYP	68	54	40	-	-	35	55- - 54	-	- -	-	-	0.0
	1			20	372	276	-	-	35	55- - 54	-	- -	-	-	0.0

*Fatigue Strength: 100 x 10^6 cycles,
unless indicated as [N] X 10^6.

Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1660 F	904 C
Melting Point - Solidus	1630 F	888 C
Density	0.307 lb/in^3 at 68 F	8.5 gm/cm^3 @ 20 C
Specific Gravity	8.500	8.5
Electrical Resistivity	39.90 ohms-cmil/ft @ 68 F	6.63 microhm-cm @ 20 C
Electrical Conductivity	26 %IACS @ 68 F	0.152 MegaSiemens/cm @ 20 C
Thermal Conductivity	67 Btu · ft/(hr · ft2·^{o}F)at 68F	116.0 W/m · ^{o}K at 20 C
Coefficient of Thermal Expansion	11.40 · 10^{-6} per ^{o}F (68-572 F)	20.5 · 10^{-6} per ^{o}C (20-300 C)
Specific Heat Capacity	0.090 Btu/lb/^{o}F at 68 F	377.1 J/kg · ^{o}K at 293 K
Modulus of Elasticity in Tension	14000 ksi	96500 MPa
Modulus of Rigidity	5300 ksi	36540 MPa

Tempers Most Commonly Used

Flat Products	
BAR, ROLLED	H02, H03
STRIP, ROLLED	H01, H02, H03, OS035

Other	
ROD	H01, H02, O60

Typical Uses

Consumer
Clock Plates and Nuts, Clock and Watch Backs, Clock Gears and Wheels

Industrial
Channel Plate

Casting Characteristics
No casting characteristics available for this alloy.