

**CDA464 (Naval Brass, Uninhibited)****Chemical Composition**

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

	Cu	Fe	Pb	Sn	Zn
Min. /Max.	59.0-62.0	.10	.20	.50-1.0	Rem.
Nominal	60.0	-	-	.7	39.2

Note: Cu + Sum of Named Elements, 99.6% min.

Applicable Specifications

Product	Specification
Bar	AMS 4611, 4612 ASTM B21 FEDERAL QQ-B-639 SAE J463, J461
Bar, Forging	ASTM B124
Bolts	ASTM F468
Forgings, Die	ASTM B283
Nuts	ASTM F467
Plate	FEDERAL QQ-B-639
Plate, Clad	ASTM B432
Plate, Condenser Tube	ASME SB171 ASTM B171
Rod	AMS 4611, 4612 ASTM B21 SAE J463, J461
Rod, Forging	ASTM B124
Screws	ASTM F468
Shapes	ASTM B21
Shapes, Forging	ASTM B124
Sheet	FEDERAL QQ-B-639
Strip	FEDERAL QQ-B-639 SAE J461, J463
Studs	ASTM F468
Wire, Metalizing	MILITARY MIL-W-6712

Common Fabrication Processes

Blanking, Drawing, Forming and Bending, Heading and Upsetting, Hot Forging and Pressing, Hot Heading and Upsetting, Shearing



Fabrication Properties

Joining Technique	Suitability
Soldering	Excellent
Brazing	Excellent
Oxyacetylene Welding	Good
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Not Recommended
Spot Weld	Good
Seam Weld	Fair
Butt Weld	Good
Capacity for Being Cold Worked	Fair
Capacity for Being Hot Formed	Excellent
Forgeability Rating	90
Machinability Rating	30

Thermal Properties

Treatment	Temp./Time - US	Temp./Time - SI
Annealing Minimum	800	427
Annealing Maximum	1100	594
Annealing Time		
Hot Works Minimum	1200	649
Hot Works Maximum	1500	816

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

Temper	Section Size	Cold Work	Temp	Tensile Strength	Yield Strength (0.5% ext. under load)	Yield Strength (0.2% offset)	Yield Strength (0.05% offset)	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 CF30T500			ksi MPa	ksi MPa	ft-lb J
Tube													
H80	0.0	35	TYP68	88	66	-	-	1895- - -	-	-	-	-	0.0
	0.0		20	607	455	-	-	1895- - -	-	-	-	-	0.0
Flat Products													
O50	0.04	0	TYP68	62	30	-	-	4060- - 57	-	-	41	-	0.0
	1		20	427	207	-	-	4060- - 57	-	-	283	-	0.0
Rod													
H01	2	8	TYP68	67	40	-	-	3575- - -	-	-	43	-	0.0
	51		20	462	276	-	-	3575- - -	-	-	296	-	0.0
O50	1	0	TYP68	63	30	-	-	4060- - -	-	-	42	-	0.0
	25.4		20	434	207	-	-	4060- - -	-	-	290	-	0.0
O60	1	0	TYP68	57	25	-	-	4755- - -	-	-	40	-	0.0
	25.4		20	393	172	-	-	4755- - -	-	-	276	-	0.0
O60	0.25	0	TYP68	58	27	-	-	4556- - -	-	-	40	-	0.0
	6.35		20	400	186	-	-	4556- - -	-	-	276	-	0.0
H01	0.25	10	TYP68	70	48	-	-	2580- - -	-	-	43	-	0.0
	6.35		20	483	331	-	-	2580- - -	-	-	296	-	0.0
Flat Products													
M20	1	0	TYP68	55	25	-	-	5055- - 55	-	-	40	-	0.0
	25.4		20	379	172	-	-	5055- - 55	-	-	276	-	0.0
O60	0.25	0	TYP68	58	25	-	-	4956- - 55	-	-	40	-	0.0
	6.35		20	400	172	-	-	4956- - 55	-	-	276	-	0.0
Rod													
H02	0.25	20	TYP68	80	57	-	-	2085- - -	-	-	45	-	0.0
	6.35		20	552	393	-	-	2085- - -	-	-	310	-	0.0
Flat Products													
O50	0.25	0	TYP68	60	28	-	-	4558- - 56	-	-	41	-	0.0
	6.35		20	414	193	-	-	4558- - 56	-	-	283	-	0.0
Rod													
H01	1	8	TYP68	69	46	-	-	2778- - -	-	-	43	-	0.0
	25.4		20	476	317	-	-	2778- - -	-	-	296	-	0.0
O50	2	0	TYP68	62	28	-	-	4360- - -	-	-	42	-	0.0
	51		20	427	193	-	-	4360- - -	-	-	290	-	0.0
H02	1	20	TYP68	75	53	-	-	2082- - -	-	-	44	-	0.0
	25.4		20	517	365	-	-	2082- - -	-	-	303	-	0.0
O50	0.25	0	TYP68	63	30	-	-	4060- - -	-	-	42	-	0.0
	6.35		20	434	207	-	-	4060- - -	-	-	290	-	0.0
O60	2	0	TYP68	56	25	-	-	4755- - -	-	-	40	-	0.0



51	20	386	172	-	-	4755	-	-	-	-	276	-	0.0
Flat Products													
H01	0.04	0	TYP 68	70	58	-	-	1775	-	68	-	43	0.0
1			20	483	400	-	-	1775	-	68	-	296	0.0

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

Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1650 F	899 C
Melting Point - Solidus	1630 F	888 C
Density	0.304 lb/in ³ at 68 F	8.41 gm/cm ³ @ 20 C
Specific Gravity	8.410	8.41
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 · ft ² · °F) at 68 F	116.0 W/m · °K at 20 C
Coefficient of Thermal Expansion	$11.80 \cdot 10^{-6}$ per °F (68-572 F)	$21.2 \cdot 10^{-6}$ per °C (20-300 C)
Specific Heat Capacity	0.090 Btu/lb/°F at 68 F	377.1 J/kg · °K at 293 K
Modulus of Elasticity in Tension	15000 ksi	103400 MPa
Modulus of Rigidity	5600 ksi	38610 MPa

Temper Most Commonly Used

Flat Products	
BAR, DRAWN	H01, H02, O50, O60
BAR, ROLLED	H01, O50, O60
PLATE	H02, M20, O60
STRIP, ROLLED	H01, O50

Other	
ROD	H01, H02, M30, O50, O60
SHAPES	H01, M30
TUBE	H58, H80

Typical Uses

Builders Hardware

Lock Pins

Electrical

Precision Shipboard Equipment

Fasteners

Nuts, Rivets, Bolts

Industrial

Structural Uses, Condenser Plates, Welding Rod, Bushings, Bearings, Valve Stems, Balls, Aircraft Turn buckle Barrels, Heat Exchanger Tube, Hub Cones, Bearings, Dies, Golf Ball Production, and Pressure Vessels

Marine

Propeller Shafts, Turn buckles, Shafting, Propeller Shafts, Decorative Fittings, Marine Hardware

Ordnance

Missile Components



Other

Baffle Plates and Flanges

Plumbing

Fittings

Casting Characteristics

No casting characteristics available for this alloy.