



**Standard Properties of Typical  
Brass, Bronze, & Aluminum Alloys**

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319.0  
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535.0

## C83600 Red Brass

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

	Cu <sup>1</sup>	Al	Sb	Fe	Pb	Ni <sup>2</sup>	P <sup>3</sup>	Si	S	Sn	Zn
MIN./MAX.	84.0-86.0	.005	.25	.30	4.0-6.0	1.0	.05	.005	.08	4.0-6.0	4.0-6.0
Nominal	85.0				5.0					5.0	5.0

- In determining Cu min., Cu may be calculated as Cu + Ni.
  - Ni value includes Co.
  - For continuous castings, P shall be 1.5%, max
- Note: Cu + Sum of Named Elements, 99.3% min.

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	AMS 4855; ASME SB62, ASTM B584; B62, SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	84

### TYPICAL USES

- Architecture:** Ornamental Fixtures
- Builders Hardware:** Hardware
- Building:** Lightning Protection, Heating Equipment, Cooling Equipment, Trowels for Cement Working
- Electrical:** Electrical Hardware, Switches, Electrical Equipment Fasteners Large Hold Down Screws
- Industrial:** Handles for Dental Equipment, Air Actuators, Valve Bodies, Valves, Bushings, Pump Parts, Pumps, Valve Bodies, Impellers, Pump Fixtures, Couplings, Valves, Transducer Housings, Valve Bodies for the Water Meter Industry, Valves for the Water Meter Industry, Pumps, Low Pressure Valves, Small Gears, Bearings, Bearing Segments for Steel Industry, Pressure Blocks for Steel Industry, Rings, Printing Presses, Furnaces
- Marine:** Marine Products, Parts for Boats
- Plumbing:** Faucets, Fixtures, Pipe Fittings

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%										
	mm.		C	MPa	MPa	MPa	MPa									MPa	MPa	J	
M01	0.0	0	TYP	68	37				30						60			11	10.0
	0.0			20	255	117			30						60			76	14.0

## C85700 Leaded Yellow Brass

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

	Cu <sup>1</sup>	Al	Fe	Pb	Ni <sup>2</sup>	Si	Sn	Zn
Min./Max	.58.0-64.0	.8	.7	.8-1.5	1.0	.05	.50-1.5	32.0-40.0
Nominal	61.0	.30		1.0			1.0	36.0

- In determining Cu min., Cu may be calculated as Cu + Ni.
  - Ni value includes Co.
- Note: Cu + Sum of Named Elements, 98.7% min.

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B584, B763

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	80

### TYPICAL USES

- Builders Hardware:** Window Hardware, Door Hardware for Prisons, Ornamental Hardware
- Consumer:** Musical Instruments
- Industrial:** Mechanical Components where Looks are Important
- Marine:** Ship Trim, Marine Hardware
- Plumbing:** Fittings, Flanges

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%										
	mm.		C	MPa	MPa	MPa	MPa									MPa	MPa	J	
M01	0.0	0	TYP	68	50	18			40						75				0.0
	0.0			20	345	124			40						75				0.0
M01	0.0	0	SMIN	68		14													0.0
	0.0			20		97													0.0

# BRASS & BRONZE ALLOYS

## C86200 Manganese Bronze

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

	Cu <sup>1</sup>	Al	Fe	Pb	Mn	Ni <sup>2</sup>	Sn	Zn
Min./Max	60.0-66.0	3.0-4.9	2.0-4.0	.20	2.5-5.0	1.0	.20	22.0-28.0
Nominal	63.0	4.0	3.0		3.7			25.0

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.0% min

### TYPICAL USES

**Builders Hardware:** Structural Parts, Brackets

**Fasteners:** Screw Down Nuts

**Industrial:** Pressing Dies for Wood Pulp, Wear Rings for Pressing Dies for Wood Pulp Industry, Cams, Bushings, Valve Stems, Worm Gears, Gears, Frames, Shafts, Hooks, High Strength Machine Parts, Struts, Marine Racing Propellers

**Marine:** Clamps, Marine Castings, Boat Parts, Rudders

**Ordnance:** Gun Mounts

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B763, B584 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	30

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	95	48			20							180			12.0
	0.0			20	655	331			20							180			16.0

## C86300 Manganese Bronze

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

	Cu <sup>1</sup>	Al	Fe	Pb	Mn	Ni <sup>2</sup>	Sn	Zn
Min./Max	60.0-66.0	5.0-7.5	2.0-4.0	.20	2.5-5.0	1.0	.20	22.0-28.0
Nominal	63.0	6.2	3.0		3.7			25.0

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.0% min

### TYPICAL USES

**Builders Hardware:** Brackets

**Electrical:** Electrical Components, Switches

**Fasteners:** Screw Down Nuts

**Industrial:** Wear Rings for Forming Dies for Wood Pulp Industry, Large Valve Stems, Hydraulic Cylinder Parts, Propellers, Bridge Pins, Forming Dies for Wood Pulp Industry, Cams, Gib, Gears, Hydraulic Cylinder Parts, Slow Speed, Heavy Load Bearings, Bushings, High Strength Machine Parts, Hooks, Frames, Struts

**Marine:** Marine Hardware, Rudders, Covers for Marine Hardware, Clamps, Boat Parts

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	AMS 4862 ASTM B763, B584, B22 SAE J462, J461

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	8

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	119	62			18							225		25	15.0
	0.0			20	821	427			18							225		172	20.0

## C86500 Manganese Bronze

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

	Cu <sup>1</sup>	Al	Fe	Pb	Mn	Ni <sup>2</sup>	Sn	Zn
Min./Max.	55.0-60.0	.50-1.5	.40-2.0	.40	.10-1.5	1.0	1.0	36.0-42.0
Nominal	58.0	1.0	1.2		.8		.5	39.0

1. In determining Cu min., Cu may be calculated as Cu + Ni.  
 2. Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.0% min.

### TYPICAL USES

**Automotive:** Weld Guns

**Builders Hardware:** Brackets

**Electrical:** Electrical Hardware

**Industrial:** Machinery Parts (Substituted for Steel and Malleable Iron), Pressing Dies for Wood Pulp, Gears, Machinery Parts requiring High Strength, Frames, Hooks, Wear Rings for Pressing Dies for Wood Pulp Industry, Forming Dies for Wood Pulp Industry, Compressors, Lever Arms, Machinery, Struts

**Marine:** Boat Parts, Covers for Marine Hardware, Rudders, Clamps, Propellers for salt and fresh water

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	AMS 4860 ASTM B584, B763 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	26

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

TEMPER	SECTION SIZE	COLD WORK	TYP/ MIN	TEMP	TENSILE STRENGTH	YIELD STRENGTH (0.5% EXT. UNDER LOAD)	YIELD STRENGTH (0.2% OFF-SET)	YIELD STRENGTH (0.05% OFFSET)	EL	ROCKWELL HARDNESS				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	71	29			30						100	130		20	0.0
	0.0			20	490	200			30						100	130		138	0.0

## C87500 Copper Silicon

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

	Cu	Al	Pb	Si	Zn
Min./Max.	79.0 min	.50	.09	3.0-5.0	12.0-16.0
Nominal	82.0			4.0	14.0

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

**Builders Hardware:** Window Hardware

**Industrial:** Levers, Fittings, Impellers, Gears, Pump Fixtures, Valve Bodies, Bearings

**Marine:** Small Boat Propellers, Boat Parts

**Plumbing:** Fixtures

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B584, B763

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	50

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

TEMPER	SECTION SIZE	COLD WORK	TYP/ MIN	TEMP	TENSILE STRENGTH	YIELD STRENGTH (0.5% EXT. UNDER LOAD)	YIELD STRENGTH (0.2% OFF-SET)	YIELD STRENGTH (0.05% OFFSET)	EL	ROCKWELL HARDNESS				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	67	30			21						115	134		22	0.0
	0.0			20	462	207			21						115	134		152	0.0

# BRASS & BRONZE ALLOYS

## C87600 Copper Silicon

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

	Cu	Fe	Pb	Mn	Si	Zn
Min./Max.	88.0 min	.20	.09	.25	3.5-5.5	4.0-7.0
Nominal	89.0				4.5	5.5

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

- Architecture:** Artistry Components
- Electrical:** Electrical Components
- Industrial:** Valve Stems, Valve Bodies, Bearings, Engineering Applications

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B584, B763

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	40

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

TEMPER	SECTION SIZE	COLD WORK	TYP/ MIN	TEMP	TENSILE STRENGTH	YIELD STRENGTH (0.5% EXT. UNDER LOAD)	YIELD STRENGTH (0.2% OFF-SET)	YIELD STRENGTH (0.05% OFFSET)	EL	ROCKWELL HARDNESS				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%					500	3000	ksi	ksi	ft-lb	
	mm.		C	MPa	MPa	MPa	MPa									MPa	MPa	J	
M01	0.0	0	TYP	68	66	32			20	76				110	135			0.0	
	0.0			20	455	221			20	76				110	135			0.0	

## C90300 Tin Bronze

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

	Cu(1)	Al	Sb	Fe	Pb	Ni(2)	P(3)	Si	S	Sn	Zn
Min./Max.	86.0-89.0	.005	.20	.20	.30	1.0	.05	.005	.05	7.5-9.0	3.0-5.0
Nominal	87.5									8.3	4.0

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

- Building:** Heavy Construction Equipment
- Fasteners:** Swivel
- Industrial:** Pump Impellers, Piston Rings, Valve Bodies, Valves, Gears, Bushings, Bearings, Pump Bodies, Gear Blanks
- Plumbing:** Steam Fittings

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B763, B584 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	30

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

TEMPER	SECTION SIZE	COLD WORK	TYP/ MIN	TEMP	TENSILE STRENGTH	YIELD STRENGTH (0.5% EXT. UNDER LOAD)	YIELD STRENGTH (0.2% OFF-SET)	YIELD STRENGTH (0.05% OFFSET)	EL	ROCKWELL HARDNESS				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%					500	3000	ksi	ksi	ft-lb	
	mm.		C	MPa	MPa	MPa	MPa									MPa	MPa	J	
M01	0.0	0	TYP	68	45	21			30					70				0.0	
	0.0			20	310	145			30					70				0.0	

## C90500 Gun Metal

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

	Cu(1)	Al	Sb	Fe	Pb	Ni(2)	P(3)	Si	S	Sn	Zn
Min./Max.	86.0-89.0	.005	.20	.20	.30	1.0	.05	.005	.05	9.0-11.0	1.0-3.0
Nominal	87.5									10.0	2.0

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.
- For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.7% min.

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	AMS 4845; ASTM B763, B584, B22; SAE J462, J461

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	30

### TYPICAL USES

**Builders Hardware:** Clamps

**Building:** Heavy Construction Equipment

**Electrical:** Connectors

**Fasteners:** Nuts

**Industrial:** Pump Bodies, Valves, Gears, Piston Rings, Pump Impellers, Bushings, Bearings, Worm Gears, Expansion Bearings, Gear Blanks, Finishing Dies for Wood Pulp Industry, Valve Bodies, Seal Rings

**Plumbing:** Water Conditioners, Steam Fittings

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	45	22			25						75			13	10.0
	0.0			20	310	152			25						75			90	13.0

## C90700 Tin Bronze, 65

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

	Cu <sup>1</sup>	Al	Sb	Fe	Pb	Ni <sup>2</sup>	P <sup>3</sup>	Si	S	Sn	Zn
Min./Max.	88.0-90.0	.005	.20	.15	.50	.50	.30	.005	.05	10.0-12.0	.50
Nominal	89.0									11.0	

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.
- For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.4% min

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B427 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	20

### TYPICAL USES

**Industrial:** Bearings, Worm Wheels, Gears, Bearings for Heavy Loads and Relatively Low Speeds, Restaurant Equipment, Gear Boxes, Speed Reducers, Valve Bodies, Worm Gears

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	44	22			20						80			25	0.0
	0.0			20	303	152			20						80			172	0.0
M01	0.0	0	SMIN	68	35	17			10						65				0.0
	0.0			20	241	117			10						65				0.0

# BRASS & BRONZE ALLOYS

## C92200 Navy M Bronze

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

	Cu <sup>1</sup>	Al	Sb	Fe	Pb	Ni <sup>2</sup>	P <sup>3</sup>	Si	S	Sn	Zn
Min./Max.	86.0-90.0	.005	.25	.25	1.0-2.0	1.0	.05	.005	.05	5.5-6.5	3.0-5.0
Nominal	88.0				1.5					6.0	4.5

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.
- For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.3% min.

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASME SB61, SB584; ASTM B61, B584; SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	42

### TYPICAL USES

**Architecture:** Ornamental Castings

**Building:** Cooling Equipment, Heating Equipment

**Fasteners:** Nuts

**Industrial:** Fittings Used to 550 F, Gears, Bushings, Bearings, Pump Impellers, Pumps Used to 550 F, Cryogenic Valves, Valves for Water Meters, Medium Pressure Hydraulic Equipment, Piston Rings, Valve Components

**Marine:** Marine Castings

**Plumbing:** Medium Pressure Steam Equipment to 550° F

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	40	20			30						65			11	0.0
	0.0			20	276	138			30						65			76	0.0

## C92700 Leaded Tin Bronze

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

	Cu <sup>1</sup>	Al	Sb	Fe	Pb	Ni <sup>2</sup>	P <sup>3</sup>	Si	S	Sn	Zn
Min./Max.	86.0-89.0	.005	.25	.20	1.0-2.5	1.0	.25	.005	.05	9.0-11.0	.7
Nominal	87.5				1.8					10.0	

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.
- For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.3% min.

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	SAE J462, J461

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	45

### TYPICAL USES

**Fasteners:** Lead Screw Nuts

**Industrial:** Pump Pistons, Steam Fittings, Bushings, Gears, Pump Impellers, Heavy Duty Bearings, Bearings

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	42	21			20						77				0.0
	0.0			20	290	145			20						77				0.0

## C93200 Tin Bronze

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

	Cu(1)	Al	Sb	Fe	Pb	Ni(2)	P(3)	Si	S	Sn	Zn
<b>Min./Max.</b>	81.0-85.0	.005	.35	.20	6.0-8.0	1.0	.15	.005	.08	6.3-7.5	1.0-4.0
<b>Nominal</b>	83.0				7.0					6.9	2.5

- In determining Cu min., Cu may be calculated as Cu + Ni.
- Ni value includes Co.
- For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.0% min

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B584, B763, B66 SAE J462, J461

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	70

### TYPICAL USES

**Automotive:** Automotive Fittings

**Fasteners:** Washers

**Industrial:** Bearings for Cranes, Trunion Bearings, Roll Neck Bearings, Rolling Mill Bearings, Linkage Bushings for Presses, Fuel Pump Bushings, Water Pump Bushings, Diesel Engine Wrist Pin Bushings, Forging Press Toggle Lever Bearings, Hydraulic Press Stuffing Box, Hydraulic Press Main Lining, Insert Bearings, Bearings, Thrust Washers, Pumps, Bushings, Machine Parts, Pump Impellers, General Purpose Bushings, Fittings, Pump Fixtures, Main Spindle Bearings, Machine Tool Bearings

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	35	18			20						65			16	6.0
	0.0			20	241	124			20						65			110	8.0

## C93700 Bearing Bronze

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

	Cu	Al	Sb	Fe <sup>1</sup>	Pb	Ni <sup>2</sup>	P <sup>3</sup>	Si	S	Sn	Zn
<b>Min./Max.</b>	78.0-82.0	.005	.50	.7	8.0-11.0	.50	.10	.005	.08	9.0-11.0	.8
<b>Nominal</b>	80.0				9.5					10.0	

- Fe shall be .35% max., when used for steel-backed
- Ni value includes Co.
- For continuous castings, P shall be 1.5%, max.

Note: Cu + Sum of Named Elements, 99.0% min.

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	AMS 4842 ASME SB584 ASTM B763, B66, B584, B22 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	80

### TYPICAL USES

**Builders Hardware:** Brackets

**Fasteners:** Washers for Engines, Nuts

**Industrial:** Crank Shafts, Bushings, Machine Parts, High Speed, Heavy Load Bearings, Pumps, Pressure Tight Castings, Impellers, Corrosion Resistant Castings, Bushings for high speed and heavy pressure, Applications Requiring Acid Resistance to Sulphite Fluids, Bearings, Bearing Plates, Parts for Steel Mill Maintenance, Slide Guides for Steel Mills

**Marine:** Large Bearings for Ships

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH	
										B	C	F	30T							ksi
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb	
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J	
M01	0.0	0	TYP	68	35	18	16		20						60			18	13	5.0
	0.0			20	241	124	110		20						60			124	90	7.0

# BRASS & BRONZE ALLOYS

## C95200 Aluminum Bronze

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

	Cu	Al	Fe
Min./Max.	86.0 min	8.5-9.5	2.5-4.0
Nominal	87.7	9.0	3.3

Note: Cu + Sum of Named Elements, 99.0% min

### TYPICAL USES

**Electrical:** Electrical Hardware

**Fasteners:** Nuts

**Industrial:** Pickling Tanks, Mild Alkali Applications, Large Gear Parts, Hydrant Parts, Valve Seats, Hot Mill Guides, Welding Jaws, Pickling Equipment, Worm Wheels, Worms, Valve Bodies, Wear Plates, Thrust Pads, Bearing Liners, Pump Parts, Valves, High Strength Clamps, Acid Resistant Pumps, Bearings, Bushings, Gears, Plungers, Pump Rods

**Marine:** Marine Hardware, Covers for Marine Hardware, Propellers, Marine Engines

**Ordnance:** Gun Mountings, Gun Slides

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASME SB148 ASTM B763, B148 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	20

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	80	27			35						125	40	22	22	30.0
	0.0			20	552	186			35						125	276	152	152	41.0

## C95400 Aluminum Bronze

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

	Cu	Al	Fe	Mn	Ni <sup>1</sup>
Min./Max.	83.0 min	10.0-11.5	3.0-5.0	.50	1.5
Nominal	83.2	10.8	4.0		

1. Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.5% min

### TYPICAL USES

**Automotive:** Weld Guns

**Fasteners:** Nuts, Large Hold Down Screws

**Industrial:** Pickling Hooks, Bearings, Pawl, Worm Gears, Machine Parts, Spur Gears, Heavily Loaded Worm Gears, Pump Parts, Landing Gear Parts, Valve Bodies, Valve Guides, Valve Seats, Bearing Segments for the Steel Industry, Pressure Blocks for the Steel Industry, High Strength Clamps, Bushings, Valves, Gears

**Marine:** Ship Building, Covers for Marine Hardware

**Ordnance:** Government Fittings

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASME SB148 ASTM B66, B148, B763 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	60

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	85	35			18						170	47	28	28	16.0
	0.0			20	586	241			18						170	324	193	193	22.0

## C95500 Aluminum Bronze

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

	Cu	Al	Fe	Mn	Ni <sup>1</sup>
Min./Max	78.0min	10.0-11.5	3.0-5.0	3.5	3.0-5.5
Nominal	80.0	11.0	4.0		4.3

1. Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

**Builders Hardware:** Window Hardware

**Consumer:** Piano Keys, Musical Instruments

**Electrical:** Electrical Hardware

**Fasteners:** Stuffing Box Nuts

**Industrial:** Pickling Equipment, Valve Guides, Piston Guides, Valve Seats, Pump Fluid Ends, Glands, Worms, Worms Wheels, Hot Mill Guides, Hand Gun Recoil Mechanisms, Landing Gear Parts, Air Craft Components, Wear Plates, Welding Jaws, Landing Gear Parts, Glass Molds, Machine Parts, Sewage Treatment Applications, Valve Components, Bearings, Bushings, Valve Bodies, Gears Marine Marine Applications, Covers for Marine Hardware, Ship Building, Marine Hardware

**Ordinance:** Government Fittings

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B148, B763 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	50

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	100	44			12	87					195	48	31	13.0	
	0.0			20	689	303			12	87					195	331	214	18.0	

## C95800 Aluminum Bronze

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

	Cu	Al	Fe <sup>1</sup>	Pb	Mn	Ni <sup>2</sup>	Si
Min./Max.	79.0 min	8.5-9.5	3.5-4.5	.03	.8-1.5	4.0-5.0	.10
Nominal	81.0	9.0	4.0		1.0	4.5	

1. Fe content shall not exceed Ni content.

2. Fe content shall not exceed Ni content. Ni value

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

**Fasteners:** Nuts

**Industrial:** Shafts, Machinery, Valve Bodies, Propeller Hub, Worm Wheels, Propeller Blades, Pickling Equipment, Worms, Wear Plates, Gears, Bushings

**Marine:** Marine Hardware, Valves in contact with sea water, Covers for Marine Hardware, Ship Building

**Plumbing:** Elbows

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B148, B763 MILITARY MIL-B-24480 SAE J461, J462

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	20

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	95	38			25						159	58	31	20.0	
	0.0			20	655	262			25						159	400	214	27.0	

# BRASS & BRONZE ALLOYS

## C97600 Nickel Silver

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

	Cu	Al	Sb	Fe	Pb	Mn	Ni <sup>1</sup>	P	Si	S	Sn	Zn
Min./Max.	63.0-67.0	.005	.25	1.5	3.0-5.0	1.0	19.0-21.5	.05	.15	.08	3.5-4.5	3.0-9.0
Nominal	65.0				4.0		20.3				4.0	6.0

1. Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.7% min

### TYPICAL USES

**Architecture:** Ornamental Castings

**Builders Hardware:** Window Hardware, Door Hardware for Prison Doors, Hardware

**Consumer:** Piano Keys

**Industrial:** Valves, Pumps

**Marine:** Marine Furniture

**Plumbing:** Sanitary Fittings

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASME SB584 ASTM B584, B763

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	70

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	45	24			20						80			16	0.0
	0.0			20	310	165			20						80			107	0.0

## C99500 NDZ-S

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

	Cu	Al	Fe	Pb	Mn	Ni	Si	Zn
Min./Max.	Rem.	.50-2.0	3.0-5.0	.09	.50	3.5-5.5	.50-2.0	.50-2.0
Nominal	88.9	1.3	4.0			4.5	1.3	1.3

Note: Cu + Sum of Named Elements, 99.7% min.

### TYPICAL USES

**Electrical:** Electrical Parts

**Industrial:** Valve Stems, Gears for Mining Equipment, Propeller Wheels

**Marine:** Outboard Marine Components

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B763

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	50

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T						
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68											145	50			0.0
	0.0			20											145	50			0.0
TF00	0.0	0	TYP	68	86	62			8						196				0.0
	0.0			20	593	427			8						196				0.0
M01	0.0	0	SMIN	68	70	40			12										0.0
	0.0			20	483	276			12										0.0

## C89520 SeBiLOY II – EnviroBrass II

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

	Cu	Al	Sb	Bi <sup>1</sup>	Fe	Pb	Ni <sup>2</sup>	P	Se <sup>3</sup>	Si	S	Sn	Zn
Min./Max.	85.0-87.0	.005	.25	1.6-2.2	.20	.09	1.0	.05	.8-1.1	.005	.08	5.0-6.0	4.0-6.0
Nominal	86.0			1.9					.95			5.5	5.0

1. Bi:Se >= 2:1
2. Ni value includes Co.
3. Bi:Se >= 2:1

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

Plumbing: Plumbing Castings

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM B584

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	85

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	31	21			10						54				0.0
	0.0			20	210	140			10						54				0.0

## C89833 Federalloy

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

	Cu	Al	Sb	Bi	Fe	Pb	Ni <sup>1</sup>	P	Si	S	Sn	Zn
Min./Max.	86.0-91.0	.005	.25	1.7-2.7	.30	.09	1.0	.050	.005	.08	4.0-6.0	2.0-6.0
Nominal	89.0			2.2							5.0	3.0

- 1.Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.3% min.

### TYPICAL USES

Industrial: Pumps, Corrosion Resistant, Pressure Tight Castings, Impellers

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	81

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	37	17			28						60				12.0
	0.0			20	258	119			28						60				16.4

# BRASS & BRONZE ALLOYS

## C87850 Silicon Brass

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

	Cu <sup>1</sup>	Sb	Fe	Pb	Mn	Ni <sup>2</sup>	P	Si	Sn	Zn
<b>Min./Max.</b>	75.0-78.0	.10	.10	.09	.10	.20	.05-.20	2.7-3.4	.30	Rem.
<b>Nominal</b>	76.0						.12	3.0		20.9

1. Cu value includes Ag.

2. Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.5% min.

### TYPICAL USES

**Industrial:** Valve Bodies for Water

**Marine:** Marine Products

**Plumbing:** Plumbing Fittings, Faucets, Water Meter Cases

### APPLICABLE SPECIFICATIONS

Product	Specification
Sand	ASTM 584

### FABRICATION PROPERTIES

Joining Technique	Suitability
Machinability Rating	70

### MECHANICAL PROPERTIES (measured at room temperature, 68° F (20° C))

As Sand Cast

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				VICKENS HARD.	BRINELL HARD.		SHEAR STRENGTH	FATIGUE STRENGTH*	IZOD IMPACT STRENGTH
										B	C	F	30T		500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%						500	3000	ksi	ksi	ft-lb
	mm.		C	MPa	MPa	MPa	MPa										MPa	MPa	J
M01	0.0	0	TYP	68	63	26			25	78									0.0
	0.0			20	434	179			25	78									0.0

**319.0** formerly 319, Allcast

**NATIONAL CHEMICAL COMPOSITION**

Cu	Si	Mg	Zn
3.5	6.0	.10	1.0

**MECHANICAL PROPERTIES** (measured at room temperature, 68° F (20° C))

TEMPER	ULTIMATE TENSILE (KSI)	YIELD STRENGTH (KSI)	ELONGATION % IN 2 IN	COMPRESSIVE YIELD (KSI)	BRINELL HARDNESS 10MM 500KG	SHEARING STRENGTH (KSI)	ENDURANCE LIMIT (KSI)
T62	41	32	2.0	34	90	33	8.0
T7	39	26	6.0		65		
F	27	18	2.0	19	70	22	10.0

**CHARACTERISTICS**

PRES-SURE	TIGHTNESS STRENGTH AT ELEVATED TEMP	CORROSION RESISTANCE
2	3	3

**356.0** formerly 356

**NATIONAL CHEMICAL COMPOSITION**

Cu	Si	Mg	Zn
.25	7.0	.3	.35

**MECHANICAL PROPERTIES** (measured at room temperature, 68° F (20° C))

TEMPER	ULTIMATE TENSILE (KSI)	YIELD STRENGTH (KSI)	ELONGATION % IN 2 IN	COMPRESSIVE YIELD (KSI)	BRINELL HARDNESS 10MM 500KG	SHEARING STRENGTH (KSI)	ENDURANCE LIMIT (KSI)
T51	25	20	2.0	21	60	20	7.5
T6	33	24	3.5	25	70	26	8.5
T7	34	30	2.0	31	75	24	9.0

**CHARACTERISTICS**

PRES-SURE	TIGHTNESS STRENGTH AT ELEVATED TEMP	CORROSION RESISTANCE
1	3	2

**535.0** formerly Almag 35

**NATIONAL CHEMICAL COMPOSITION**

Cu	Si	Mg	Zn	Be
.05	.15	6.9		.005

**MECHANICAL PROPERTIES** (measured at room temperature, 68° F (20° C))

TEMPER	ULTIMATE TENSILE (KSI)	YIELD STRENGTH (KSI)	ELONGATION % IN 2 IN	COMPRESSIVE YIELD (KSI)	BRINELL HARDNESS 10MM 500KG	SHEARING STRENGTH (KSI)	ENDURANCE LIMIT (KSI)
F	40	20	13	35	70	27	10

**CHARACTERISTICS**

PRES-SURE	TIGHTNESS STRENGTH AT ELEVATED TEMP	CORROSION RESISTANCE
5	3	1



**visit us online at [www.alubra.com](http://www.alubra.com)**

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