Aluminum Bronze Alloy Properties

Aluminum Bronzes are copper-base alloys containing 6% to 12% aluminum and varying amounts of iron, nickel, manganese and/or silicon alloying additions that provide a broad range of mechanical properties – from high ductility to the high-strength levels of high-tensile manganese bronze.

As dramatically different properties can be brought about by comparatively small changes in chemical composition, it is important that producers fully understand that the consistency and reliability of aluminum bronze products can be maintained only by close control of chemical composition and manufacturing methods. Continue reading to learn about the properties of this alloy.

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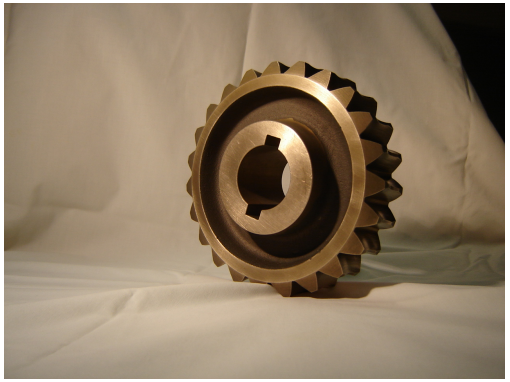

C95200, C95300, C95400, C95500, C95800

The family of aluminum bronze alloys offers high strength and hardness, excellent corrosion resistance, good wearing qualities and good fatigue resistance. The alloys are well suited for service at elevated temperatures.

Foundry practice for aluminum bronze must be carefully controlled. The elimination of oxide inclusions is one of the principal problems. Agitation of the metal, whether in the furnace or during casting, can lead to harmful results.

Explore our charts below to get a full understanding of various aluminum bronze hardness measurements, tensile strength, and other properties and applications for use.

Typical Bronze & Brass Alloys								...	...	Suitability for being joined by:		...	...	...	Typical Mechanical Properties						...	...
CA#	Ingot #	Previous Trade Name	Alloy Name	Nominal Composition	ASTM	Federal	Former Federal	Military	Approx. Weight, lb./in.3	Soldering	Brazing	Castability (Ranked 1-8, 1 is the best or highest)	Fluidity (Ranked 1-8, 1 is the best or highest)	Machinability Rating (Free Cutting Brass = 100)	Tensile Strength, ksi	Yield Strength, ksi	Elongation, Percentage in 2 in.	Shear Strength, ksi	Fatigue Strength (100 million cycles), ksi	Brinell Hardness (500-kg Load) *(3000-kg Load)	Shrinkage Allowance	Pattern Maker's Shrinkage
952	415A	Ampco A1	Aluminum Bronze	88-3-9	B30, B148, B271, B505	QQ-B-675, QQ-C-390	QQ-B-671, QQ-C-390	MIL-C-22887, MIL-C-22229	0.276	Good	Good	8	5	50	80	27	35	40	22	110*	1.60%	2%
953	415B	Ampco B2	Aluminum Bronze	89-1-10	B30, B148, B271, B505	QQ-B-675, QQ-C-390	QQ-B-671, QQ-C-390	MIL-C-11866, QQ-C-390	0.272	Good	Good	8	5	55	70-85	30-35	20-35	…	…	110-160*	1.60%	1.60%

Typical Bronze & Brass Alloys								…	…	Suitability for being joined by:		…	…	…	Typical Mechanical Properties						…	…
954	415C	AmpcoC3	Aluminum Bronze	85-4-11	B30, B148, B271, B505	QQ-B-675, QQ-C-390	QQ-B-671, QQ-C-390	MIL-C-11866, MIL-C-15345	0.269	Good	Good	8	5	60	85	35	18	47	28	175*	1.60%	1.60%
955	415	Ampco D4	Aluminum Bronze	81-4-4-11	B30, B148, B271, B505	QQ-B-675, QQ-C-390	QQ-B-671, QQ-C-390	MIL-C-11866, MIL-C-15345, MIL-C-22087, MIL-C-22229	0.272	Good	Good	8	5	50	95	50	5	…	31	195*	1.60%	1.60%
958	415	…	Aluminum Bronze	81-4-5-9-1Mn	B30, B148, B271, B505	QQ-B-675, QQ-C-390	QQ-C-390	MIL-C-15345, MIL-B-21230, MIL-C-22229, MIL-B-24480	0.276	Good	Good	8	5	50	85	35	15	…	33	160-180*	1.60%	1.60%

Typical Bronze & Brass Alloys					
CA#	Ingot #	Previous Trade Name	Alloy Name	Nominal Composition	Applications
952	415A	Ampco A1	Aluminum Bronze	88-3-9	Acid-resisting pumps, bearings, bushings, gears, valve seats, guides, plungers, pump rods, nonsparking hardware
953	415B	Ampco B2	Aluminum Bronze	89-1-10	Pickling baskets, nuts, gears, steel mill slippers, marine equipment, welding jaws, non-sparking hardware
954	415C	Ampco C3	Aluminum Bronze	85-4-11	Pump impellers, bearings, gears, worms, bushings, valve seats and guides, rolling mill slippers, slides, nonsparking hardware
955	415	Ampco D4	Aluminum Bronze	81-4-4-11	A heavy duty, dense, high-strength alloy, with hardness equal to that of manganese bronze, and excellent resistance to corrosion and fatigue. Has good wearing qualitites for elevated temperature uses. For gun slides and mountings, for worm wheels and gears, valve seats, bearings and bushings, propeller blades and hubs, liners, and bearing plates subjected to heavy loads, and shaft sleeves in highly stressed shafting.
958	415	…	Aluminum Bronze	81-4-5-9-1Mn	Propeller blades and hubs for fresh and salt water service, fittings, gears, worm wheels, valve guides and seals, structural applications

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