

Aluminum Forging Alloys

Commercial Designation	Mechanical Properties*				Physical Properties					Material Composition %	Specifications ASTM
	Tensile Strength psi	Yield Strength psi (2% Offset)	Elongation in 2" (%)	Hardness Brinell 500Kg 10mm ball	Density lb./cu. in. at 68°F	Melting Point (Solidus) °F	Coeff. Thermal Exp. Per °F x 10 ⁻⁷	Thermal Cond. BTU / Ft.Hr. °F	Elec. Cond. (Vol.)		
6061-T6	38,000	35,000	7	80	0.098	1080	131	96.5	40	Cu 0.15-0.40 Cr 0.04-0.35 Si 0.40-0.80 Mg 0.20-0.80 Al Bal.	B-247
7075-T6	75,000 up to 1" thick	64,000	7	135	0.101	990	130	75	33	Cu 1.20-2.00 Mg 2.10-2.90 Cr 0.18-0.28 Zn 5.10-6.10 Al Bal.	B-247
2014-T6	65,000 up to 2" thick	56,000	6	125	0.101	945	128	89	40	Cu 3.90-5.00 Mn 0.40-1.20 Si 0.50-1.20 Mg 0.20-0.80 Al Bal.	B-247

*Mechanical properties of any forging are influenced by size and shape.

Brass and Bronze Forging Alloys

Copper Alloy Number	Commercial Designation	Mechanical Properties*					Physical Properties		Material Composition %
		Tensile strength psi	Yield Strength psi (1/2% ext.)	Elongation in 2" (%)	Shear Strength psi	Hardness Rockwell B	Relative Machinability Rating %	Denisty lb./cu. in. at 68°F	
377	Forging Brass	58,000	23,000	40	35,500	45	80	0.305	Cu 59.00 Pb 2.00 Zn Bal.
642	Aluminum – Silicon Bronze	75,000	35,000	32	N/A	77	60	0.278	Al 7.0 Si 0.85 Cu Bal.
675	Manganese Bronze Type A	70,000	32,000	33	43,000	69	30	0.302	Cu 59.00 Mn 0.15 Sn 1.00 Fe 1.00 Zn Bal.

*Relative forgeability takes into consideration such variables as pressure, die wear and plasticity (hot). Since it is impractical to reduce these variables to units, calibration in terms of a percentage of the most generally used alloys, “forging brass” (100%) is considered that most practical basis for such ratings.