

Non-Ferrous Alloys

CHART OF BRASS & BRONZE STANDARD CASTING ALLOYS																							TENSILE KSI MIN.	YIELD KSI MIN.	ELONGATION % MIN.	BRINELL HARDNESS 500KG #3000 BU
SPECIFICATIONS						CHEMICAL COMPOSITION - PERCENT																				
FAMILY	ASTM	CDA	INGOT	FEDERAL	MILITARY	COMMON DESIGNATION	Cu%		Sn%		Pb%		Zn%		Ni%		Fe%		Al%		OTHERS %					
							MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX						
RED BRASS	B62-836	836	115	QQ-C-390B (836)		85-5-5	84.0	86.0	4.0	6.0	4.0	6.00	4.0	6.0		1.0		0.3		0.005		30	14	20	60	
MANGANESE BRONZE	B584-862	862	423	QQ-C-390B (862)		MANGANESE BRONZE	60.0	66.0		0.20		0.20	22.0	28.0		1.0	2.0	4.0	3.0	4.9	Mn 2.5-5	90	45	18	●180	
	B584-863	863	424	QQ-C-390B (863)		MANGANESE BRONZE	60.0	66.0		0.20		0.20	22.0	28.0		1.0	2.0	4.0	5.0	7.5	Mn 2.5-5	110	60	12	●225	
	B584-865	865	421	QQ-C-390B (865)		MANGANESE BRONZE	55.0	60.0		1.00		0.40	36.0	42.0		1.0	0.40	2.0	0.50	1.5	Mn .10-1.5	65	25	20	100, ●130	
COPPER SILICON	B584-873	873	500	QQ-C-390B (873)		SILICON BRONZE	94.0		0.20	1.0		0.09						0.20		Si 3.5-4.5	45	18	20	85		
	B584-875	875	500	QQ-C-390B (875)		SILICON BRASS	79.0			1.0		0.09	12.0	16.0				2.5		Si 3.0-5.0	60	24	16	115, ●134		
TIN BRONZE	B584-903	903	225	QQ-C-390B (903)		NAVY "G"	86.0	89.0	7.5	9.0		0.30	3.0	5.0		1.0		0.20		0.005		40	18	20	●70	
	B584-905	905	210	QQ-C-390B (905)		SAE-62	86.0	89.0	9.0	11.0		0.30	1.0	3.0		1.0		0.20		0.005		40	18	20	●75	
	B584-907	907	205	QQ-C-390B (907)		SAE-65	88.0	90.0	10.0	12.0		0.50		0.50		0.50		0.15		0.005		40	25	10	●80	
LEADED TIN BRONZE	B61	922	245	QQ-C-390B (922)	B16541	NAVY "M"	86.0	90.0	5.5	6.5	1.0	2.00	3.0	5.0		1.0		0.25		0.005		34	16	24	●65	
	B584-927	927	206	QQ-C-390B (927)		SAE-63	86.0	89.0	9.0	11.0	1.0	2.50		0.7		1.0		0.2		0.005		38	20	8	●77	
	B148-953	953	415B	QQ-C-390B (953)		ALUMINUM BRONZE	86.0										0.8	1.5	9.0	11.0	Mn .50 MAX	65	25	20	●140	
	B148-954	954	415C	QQ-C-390B (954)		ALUMINUM BRONZE	83.0										1.5	3.0	5.0	10.0	11.5	75	30	12	●170	
	B148-955	955	415D	QQ-C-390B (955)		NICKEL ALUMINUM BRONZE	78.0									3.0	5.5	3.0	5.0	10.0	11.5	90	40	6	●195	
	B148-958	958	415D	QQ-C-390B (958)	B24480A	NICKEL ALUMINUM BRONZE	79.0									4.0	5.0	3.5	4.5	8.5	9.5	85	35	15	●159	

CHART OF COPPER NICKEL & MONEL CASTING ALLOYS																							TENSILE KSI MIN.	YIELD KSI MIN.	ELONGATION % MIN.	HARDNESS 500KG #3000 BEG
SPECIFICATIONS						CHEMICAL COMPOSITION - PERCENT																				
FAMILY	ASTM	CDA	FEDERAL	MILITARY	COMMON DESIGNATION	Cu%		Ni%		Mn%		Fe%		LEAD	Si%		Cb%		C							
						MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MAX						
COPPER NICKEL	B369-96-962	962	415B	QQ-C-390A (962)	MIL-C-20159C TY-II	90/10 COPPER NICKEL	REMAINDER	9.0	11.0		1.5	1.0	1.8		0.01		0.50	1.0	0.10		45	25	20			
	B369-96-964	964		QQ-C-390A (964)	MIL-C-20159C TY-I	70/30 COPPER NICKEL	REMAINDER	28.0	32.0		1.5	0.25	1.5		0.01		0.50	0.50	1.5	0.15		60	32	20	●140	
MONEL	A194	M30C		QQ-N-288 COMP E		WELDABLE GRADE	26.0	33.0	REMAINDER		1.50		3.50			1.0	2.0	1.0	3.0	0.30	65	32	25.0	●125-150		

CHART OF ZINC-ALUMINUM CASTING ALLOYS																							TENSILE KSI MIN.	YIELD KSI MIN.	ELONGATION % MIN.	HARDNESS 500KG #3000 BEG
SPECIFICATIONS						CHEMICAL COMPOSITION - PERCENT																				
FAMILY	ASTM	CDA	FEDERAL	MILITARY	COMMON DESIGNATION	Cu%		Zn%		Al%		Mg%														
						MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX													
ZA-12	B-669 (INGOT)				ZA-12	0.5	1.2	REMAINDER	10.8	11.5	0.020	0.030									40	31	1	90-110		
ZA-27	B-669 (INGOT)				ZA-27	2.0	2.5	REMAINDER	25.0	28.0	0.012	0.020									58	54	3	110-120		

CHART OF ALUMINUM CASTING ALLOYS																							TENSILE KSI MIN.	YIELD KSI MIN.	ELONGATION % MIN.	BRINELL HARDNESS 500KG #3000				
SPECIFICATIONS						CHEMICAL COMPOSITION - PERCENT																								
AA NUMBER	ASTM B26-68	SAE	FEDERAL QQ-A-601D	Si%		Fe%		Cu%		Mn%		Mg%		Cr%		Ni%		Zn%		Ti%		OTHERS %								
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX									
319.0	ASTM B26-319.0	326	319	5.5	6.5		1.0	3.0	4.0		0.50		0.10	0.25	0.45						0.35		0.25	0.50	F	23.0	13.0	1.5	70	
A356.0	ASTM B26-356.0	336	A356	6.5	7.5		0.20		0.20		0.10	0.25	0.45										0.10	0.20	0.15	T6	34.0	24.0	3.5	80
B443.0	ASTM B26-443.0	35	43	4.5	6.0		0.8		0.15		0.35		0.05									0.35	0.25	0.15	F	17.0	6.0	3.0	40	
712	ZG61A	310	712		0.30		0.50		0.25		0.10	0.50	0.65	0.40	0.6								0.15	0.25	0.20	F	34.0	25.0	4.0	75

The alloys listed on this guide are representative of some of the alloys and specifications that we produce. This list should not be construed as all-inclusive or complete. If you do not see the exact metal you require, please contact Synergy Metal Solutions.

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70	30	35.0	140
70	30	30.0	150
70	30	35.0	140
70	30	30.0	170

Ferrous Alloys

ALLOY	SPECIFICATIONS				PROPERTIES						
	ASTM / ACI	Military	AMS	UNS	Tensile (ksi)		Yield (ksi)		Elongation (%)		Brinell Hardness
					Min	Typical	Min	Typical	Min	Typical	
303	A743 CF16Fa		5341	J92701	70	77	30	40	25	52	150 TYP.
304	A743 CF8	Mil S 867 A CL.I	5370	J92600	70	77	30	37	35	55	140 TYP.
	A351 CF8		5501	J92600	70	77	30	37	25	55	140 TYP.
304L	A743 CF3		5511	J92500	70	77	30	36	35	60	140 TYP.
	A351 CF3		5511	J92500	70	77	30	36	35	60	140 TYP.
HF	A297 HF			J92603	70	92	35	45	25	38	165 TYP.
309	A297 HH			J93503	75	80	35	40	10	15	180 TYP.
	A743 CH 20			J93402	70	77	30	36	30	50	180 TYP.
310	A297 HK		5366	J94224	65	75	35	50	10	17	170 TYP.
	A743 CK 20	Mil S 20150 CL.A		J94202	65		28		30		170 TYP.
312	A297 HE			J93403	85	97	40	63	9	18	190 TYP.
	A743 CE 30			J93423	80			40		10	190 TYP.
316	A743 CF8M	Mil S 867A CL.III	5507	J92900	70	80	30	42	30	50	156-170 TYP.
	A351 CF8M		5360	J92900	70	80	30	42	30	50	156-170 TYP.
316L	A743 CF3M			J92800	70	80	30	38	30	55	150 TYP.
	A351 CF3M			J92800	70	80	30	38	30	55	150 TYP.

Ferrous Alloys

ALLOY	SPECIFICATIONS				PROPERTIES						
	ASTM / ACI	Military	AMS	UNS	Tensile (ksi)		Yield (ksi)		Elongation (%)		Brinell Hardness
					Min	Typical	Min	Typical	Min	Typical	
317	A743 CG8M			J93000	75	82.5	25	44	25	45	176 TYP.
	A351 CG8M			J93000	75	82.5	35	44	25	45	176 TYP.
317L	A743 CG3M			J92999	75	82.5	35	44	25	45	176 TYP.
	A351 CG3M			J92999	75	82.5	35	44	25	45	176 TYP.
327	A297 HD			J93005	75	85	35	48	8	16	190 TYP.
330	A297 HT			N08002	65	70			4	10	149 TYP.
	A351 HT 30			N08030	65	70	28		15		149 TYP.
347	A743 CF8C	Mil S 867 A CL.II	5363	J92640	70	77	30	40	30	39	149 TYP.
	A351 CF8C		5646	J92710	70	77	30	40	30	39	149 TYP.
ALLOY 20	A743 CN7M			N08007	62		25		35		197 TYP.
	A351 CN7M			N08007	62		25		35		197 TYP.
ALLOY 20 Cb3				N08020							197 TYP.
DELTA 50	A743 CG6MMN			J93790	85		42.5		30		190 TYP.
	A351 CG6MMN			J93790	85		42.5		30		190 TYP.
DELTA 60	A351 CF10SMnN			S21800	85		42.5		30		190 TYP.
	A743 CF10SMnN			J92972	85		42.5		30		190 TYP.
410	A743 CA 15	Mil S.16993 CL.I	5613	J91150	90		65		18		N&T ANN 241 MAX
	A217 CA 15		5351		90		65		18		N&T ANN 241 MAX
416			5349	S41600	90		65		18		N&T ANN 241 MAX
420	A743 CA 40			J91153	100		70		15		N&T ANN 269 MAX
420F	A743 CA40F			J91154	100		70		12		N&T ANN 269 MAX
431			5353	J91651		125		95		20	N&T ANN 269 MAX
440A				J91606		105		60		20	N&T ANN 286 MAX
440C			5352	J91639		110		65		14	N&T ANN 302 MAX

Ferrous Alloys

ALLOY	SPECIFICATIONS				PROPERTIES						
	ASTM / ACI	Military	AMS	UNS	Tensile (ksi)		Yield (ksi)		Elongation (%)		Brinell Hardness
					Min	Typical	Min	Typical	Min	Typical	
CA6NM	A743 CA6NM			J91540	110	120	80	100	15	24	285 MAX
	A487 CA6NM			J91540	110	120	80	100	15	24	286 MAX
15-5 PH	A747 CB7Cu-2		5348	J92110	175 (H925)	189 (H925)	150 (H925)	165 (H925)	5 (H925)	11 (H925)	H975 375 MAX OR SOL ANNLD 363 MAX
17-4 PH	A747 CB7Cu-1		5398	J92180	175 (H925)	189 (H925)	150 (H925)	165 (H925)	5 (H925)	11 (H925)	
CD4MCu	A890 1A-99			J93370	100	108	70	81.5	16	25	224 MIN
	A351 CD4MCu-03			J93370	100	108	70	81.5	16	25	
CD4MCuN	A890 1B			J93372	100	108	70	81.5	16	25	
2A	A890 2A			J93345	95		65		25		
	CE8MN			J93345	95		65		25		
3A	A890 3A			J93371	95		65		25		
	CD6MN				95		65		25		
2205	A890 4A			J92205	90		60		25		
	CD3MN				90		60		25		
5A	A890 5A			J93404	100		75		25		
	CE3MN				100		75		25		
Z100 DUPLEX	A890 6A			J93380	100		65		25		
	CD3MWCuN			J93380	100		65		25		
254 SMO	A743 CK3MCuN			J93254	80		38		25		
	A351 CK3MCuN			J93254	80		38		25		
ALLOY 255				S32550					25		
CZ 100	A494 CZ100			N02100	50		18		10		
HAST X	A494 N12 MV		5390, 5396	N30012	76		40		6		
HAST C	A494 CW12MW			N30002	72		40		4		
NICKEL 600	A494 CY40			N06040	70		28		30		
NICKEL 625	A494 CW6MC	Mil C 24615		N26625	70		40		25		
NICKEL 800	B407			N08800	75		30		30		
NICKEL 825	B423			N08825	75		30		30		
M-35-1	A494 M-35-1	Mil C 15345 Alloy 18		N24135	65		25		25		125-150***
M-30-H	A494 M-30-H	Mil C 15345 Alloy 16		N24030	100		60		10		243-294***
HI STRENGTH H		Mil C 15345 Alloy 26			120		80		10		250-300***
M-25-S	A494 M-25-S	Mil C 15345 Alloy 17	4892	N24025	-----		-----		-----		300 MIN
M-30-C	A494 M-30-C	Mil C 15345 Alloy 19		N24130	65		32.5		25		125-150***
DELTA 88	A494 CY5SnBIM			N26055							

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ALLOY	SPECIFICATIONS				PROPERTIES						
	ASTM / ACI	Military	AMS	UNS	Tensile (ksi)		Yield (ksi)		Elongation (%)		Brinell Hardness
					Min	Typical	Min	Typical	Min	Typical	
Ni-RESIST 1	A436 TYPE 1	Mil G 858 Type 1		F41000	25	30					131-183
Ni-RESIST 2	A436 TYPE 2	Mil G 858 Type 2		F41002	25	30					118-174
NI-RESIST 3	A436 TYPE 3			F41004	25	30					118-159
Ni-RESIST D-2	A439 TYPE D-2				58		30				139-202
Ni-RESIST D-3	A439 TYPE D-3				55		30				139-202
COBALT 3		Mil C 15345 Alloy 21		R30103	85						50 RC MIN
COBALT 6		Mil C 15345 Alloy 20	5387	R30006	100				0.5		37 RC MIN
70-30 CuNi	B369 C96400	Mil C 20159 Type I		C96400	60	68	32	37	20	28	
	B369 C96400	Mil C 15345 Alloy 24			60	68	32	37	20	28	
90-10 CuNi	B369 C96200	Mil C 20159 Type II		C96200	45		25		20		
	B369 C96200	Mil C 15345 Alloy 25		C96200	45		25		20		
9A AL BRZ.	B271 C95200			C95200	65		25		20		110 MIN
9B AL BRZ.	B271 C95300			C95300	65		25		20		110 MIN
9C AL BRZ.	B271 C95400	Mil C 15345 Alloy 13		C95400	75	85	30	35	12	18	150 MIN
9D AL BRZ.	B271 C95500	Mil C 15345 Alloy 14	4880	C95500	90	100	40	44	6	12	190 MIN
9D Ni AL BRZ.	B271 C95800			C95800							

The alloys listed on this guide are representative of some of the alloys and specifications that we produce. This list should not be construed as all-inclusive or complete. If you do not see the exact metal you require, please contact Synergy Metal Solutions. This chart is intended as a general offering of basic information regarding the listed alloys. While reasonable efforts have been made to verify the validity of information herein, the information should not be utilized for product engineering decisions.

