

CHEMICAL MECHANICAL PROPERTIES OF CORROSION RESISTANT AND HIGH STRENGTH ALLOYS

ALLOY				CHEMICAL				
Group	Common Name	A.M.S. No.	Federal or ASTM Spec. No.	Cr.	Ni.	C.	Mn.	Si.
STAINLESS STEEL AND HIGH TEMP.	Stainless Steel 303		QQ-S-763 CL 303	17.-19.	8.-10.	0.15	2.0 Max.	1.0 Max.
	Stainless Steel 304		QQ-S-763 CL 304	18.-20.	8.-12.	0.08	2.0 Max.	1.0 Max.
	Stainless Steel 305		QQ-S-763 CL 305	17.-19.	10.-13.	0.12	2.0 Max.	1.0 Max.
	Stainless Steel 302		QQ-S-763 CL 302	17.-19.	8.-10.	0.15	2.0 Max.	1.0 Max.
	Stainless Steel 302Cu XM-7			17.-19.	8.-10.	0.10		
	Stainless Steel 310	5651	QQ-S-763 CL 310	24.-26.	19.22.	0.25	2.0 Max.	
	Stainless Steel 316	5648	QQ-S-763 CL 316	16.-18.	10.-14.	0.08	2.0 Max.	1.0 Max.
	Stainless Steel 321	5645	QQ-S-763 CL 321	17.-19.	9.-12.	0.08	2.0 Max.	1.0 Max.
	Stainless Steel 347	5646	QQ-S-763 CL 347	17.-19.	9.-13.	0.08	2.0 Max.	1.0 Max.
	Stainless Steel 16-18		QQ-S-763 CL 347	15.-18.	17.-19.	0.08	2.0 Max.	1.0 Max.
	Stainless Steel Alloy N0.20			19.-21.	30.-38.	0.07	2.0 Max.	1.0 Max.
	Stainless Steel 410	5613	QQ-S-763 CL 410	11.50-13.50	.75 Max.	.10-.15	1.0 Max.	1.0 Max.
	Stainless Steel 416		QQ-S-763 CL 416	12.-14.		0.15	1.25 Max.	1.0 Max.
	Stainless Steel 430		QQ-S-763 CL 430	14.-18.		0.12	1.0 Max.	1.0 Max.
	Stainless Steel 431		QQ-S-763 CL 431	15.-17.	1.25-2.50	0.20	1.00	1.0 Max.
	15-7 PH	5657		14.-17.	6.5-7.25	0.09	1.0 Max.	1.0 Max.
	17-4 PH	5643		15.50-17.50	3.-5.	0.07	1.0 Max.	1.0 Max.
17-7 PH	5644		16.-18	6.50-7.75	0.09	1.0 Max.	1.0 Max.	
A-286	5737		13.50-16.	24.-27.	0.08	1.-2.	1.0 Max.	
ALUMINUM	Aluminum 2024	4120	QQ-A-200/3C	0.1			.3-.9	.50 Max.
	Aluminum 2011		QQ-A-365					.40 Max.
	Aluminum 6061		QQ-A-270	.15-.35			.15 Max.	.4-.8 Max.
	Aluminum 7075		QQ-A-282	.18-.4			.3 Max.	.5 Max.
TITANIUM	Titanium 4-4	4925	Mil-T-9046 CL 6	0.15			3.00-5.00	
	Titanium 6-4	4928	Mil-T-9046 CL 5	0.1		0.08		
	Titanium 8-1-1			0.05		0.15		
	Titanium 5-2.5	4926	Mil-T-9046 CL 2	0.15				
COPPER-BASE	Yellow Brass		QQ-B-626 Alloy 268					
	C.W. Naval Brass		QQ-B-637 Alloy 462					
	Std. Naval Brass		QQ-B-637 Alloy 464					
	High Silicon Bronze		QQ-C-591 Alloy 655		0.6		1.5 Max.	2.8-3.8
	Low Silicon Bronze		QQ-C-591 Alloy 651		0.6		.7 Max.	.8-.2
	Leaded High Silicon Bronze		QQ-C-591 Alloy 660				1.5 Max.	2.8-3.5
	Silicon Nickel Bronze		QQ-C-591 Alloy 647		1.6-2.2			.4-.8
	Free Cutting Brass		QQ-B-626 Alloy 360					
High Leaded Brass		ASTM-B-121 Alloy 353						
NICKEL-BASE	Nickel-Copper Monel 400		QQ-N-281 CL "A"		63.-70.	0.20	2.0 Max.	.5 Max.
	Nickel-Copper Monel 405		QQ-N-281 CL "B"		63.-70.	0.30	2.0 Max.	.5 Max.
	Nickel-Copper-Alum. Monel K-		QQ-N-286 CL "A"		63.-70.	0.25	1.5 Max.	.5 Max.
	Inconel-X 750	566		14.-17	70. Min.	0.08	1.0 Max	.5 Max.
	Hastelloy "C"		ASTM-B-336	14.50-16.50	Rem.	0.08	1.0 Max.	1.0 Max.
ALLOY STEEL	AISI 4037			.80-1.10		.35-.40	.70-.90	.15-.35
	AISI 4137			.80-1.10		.35-.40	.70-.90	.20-.35
	AISI 4140			.40-.60		.38-.43	.75-1.00	.15-.35
	AISI 8650			.40-.60	.40-.70	.48-.53	.75-1.00	.15-.35
	AISI 8740				.40-.70	.38-.43	.75-1.00	.20-.35

The list of standard types of Stainless Steels given in this table are those most common used in the manufacture of socket screws and furnished by the American Iron and Steel Institute, Committee of Stainless Steel Producers. It is not offered as a complete listing of all the stainless steel alloys available from the various steel producing companies but is representative of the more important and widely used types.

CHEMICAL MECHANICAL PROPERTIES OF CORROSION RESISTANT AND HIGH STRENGTH ALLOYS

COMPOSITION -- PER CENT				TYPICAL MECHANICAL PROPERTIES				
				As Worked Condition			Heat Treated Condition	
Mo.	Cu.	Fe.	Other	Yield K.S.I.	Tensile K.S.I.	Elongation	Yield K.S.I.	Tensile K.S.I.
.60 Max.			S .15 Min., P .2	40	80	35%		
			P .045, S .030	40	80	35%		
			P .045	40	80	35%		
			P .045, S .030	40	80	35%		
			P .045, S .030, Cu 3.0-4.0					
			P .045, S .030	40	80	35%		
2.-3.			P .045, S .030	40	80	35%		
			P .045, S .030, Ti 5xC Min.	40	80	35%		
				40	80	35%		
			P .045, S .030	40	80	35%		
2.-3.	3.-4.		Cb and Ta 8xC Min.-1.0 Max. 5-.035	40	85	30%		
.50 Max.	.50 Max.		P .040, S .030, Al-.05, SN .05 max.	40	70	22%	95	140
.60 Max.			P .06, S .15	40	70	22%	90	120
			P .040, S .030	40	70	22%		
			P .040, S .030	90	115	15%	120	150
2.-3.			Al .75-2.5	55	130	35%	160	180
	3.-5.		P .040, S .030, Cb-Ta 5xC-.45	120	150	20%	170	190
			P .040, S .030, Al .75-1.5	40	130	30%	140	170
			P .040, S .025, Ti 1.90-2.30, Al .35, V .1-.5	50	120	40%	85	130
1.-1.50	3.8-4.9	0.50	Mg 1.2-1.8, Zn .25, Al Rem.	11	27	22%	40	55
	5.-6.	0.70	Pb .2-.6, Bi .2-.6, Al Rem.	8	18	30%	49	64
	.15-.4	0.70	Mg .8-1.2, Al Rem.				35	42
	1.2-2.	0.70	Zn 5.1-6.1, Mg 2.12.9, Al Rem.	33	15	16%	66	77
		0.50	Al 3.-5., N .07, H .0125	130	140	10%	150	160
		0.30	Al 5.5-6.75, V 3.5-4.5, N .05, H .0125 Y .005	120	130	10%	150	160
.75-1.25		0.25	Al 7.30-8.30, V .75-1.25, O .125, H .012	120	125	18%		
		0.50	Al 4.-6., Sn 2.-3., H .008, Mn .30, O .15, N .07	120	130	10%		
	64.-68	0.03	Pb .15 -Zn Rem.	-	57	20%		
	62.-65.	0.10	Sn .5-1.0 -Pb .20 -Zn Rem.	27	60	20%		
	59.-62.	0.10	Sn .5-1.0 -Pb .20 -Zn Rem.	27	60	25%		
	94.8 Min.	0.80	Zn 1.5 Max., Pb .05	38	70	15%		
	96	0.80	Zn 1.5, Pb .05	45	75	80%		
	94	0.25	Pb .2-.8	38	70	15%		
		0.10	Zn .50, Pb .10	30	70	12%	75	90
	60.-63.	0.35	Pb 2.5-3.7, Zn Rem.	25	57	10%		
	60.-63.	0.10	Pb 1.5-2.5, Zn Rem.	55.-65.	RB 57-74	35%		
	32.5 Rem.	2.50	Al .5, S 0.15, Pb .006, SN .006, ZN .02, P .02	40	80	20%		
	32.0 Rem.	2.50	S .025-.60, Pb .006, SN .006, ZN .02, P .02	50	85	15%		
		2.00	Al .52.30-3.15, S .010, Ti .35-.85	60	105	30%	90	130
	0.50	5.-9.	S .01, CO 1.0, Cb+Ta .7-1.2, T .225-.275, Al .4-1.0	50	120	20%		
15.-17.		4.-7.	W 3.-4.50, Co 2.50, V .35, P .040, S .030	64	125	20%		
.20-.30			S .04 Max., P .035 Max.	50	85			
.15-.25			S .04 Max., P .035 Max.	50	85			
.15-.25			S .04 Max., P .035 Max.	60	95	25%		
.15-.25			S .04 Max., P .035 Max.	56	103	22%		
.20-.30			S .04 Max., P .035 Max.	60	100	22%		

NOTE: THE MECHANICAL PROPERTIES SHOWN ARE APPROX. FIGURES. FOR HEAT TREATED CONDITION OF THE ALLOY STEEL GROUP, REFER TO THE APPROPRIATE PRODUCT SECTION FOR THE EXACT MECHANICAL PROPERTIES.