

# ALLOY GUIDE - Strip & Plate

NOTE: Following chart shows property in typical thickness and only serves as a general guideline. For exact specifications, please contact us.

MSC Alloy Name	OFC	TC	DC1B	C151	C151S	MZC1	ZC	TAMAC4	TAMAC194	B1	B3	MNEX10	MAX251	MAX251C	MAX375	MSP1	MSP5	MSP8	HRSC	WNS7
JIS No.	C1020	C1100	C1220							C2600	C2801									
CDA No.	C10200	C11000	C12200	C15100	C15100	C18140(1/2H, H) C18141(SH)	C15150		C19400	C26000	C28000	C41125	C64725	C64725	C64727	C18665	C18670	C18661	C18625	C76800
Nominal Composition [wt%]	Cu:99.96Min.	Cu:99.90Min.	Cu:99.90Min. P:0.03	Cu:99.9 Zr:0.1	Cu:99.9 Zr:0.1	Cu:99.6 Cr:0.25 Zr:0.1 Si:0.02	Cu:99.98 Zr:0.02	Cu:99.87 Fe:0.1 P:0.03	Cu:97.6 Fe:2.3 Zn:0.12 P:0.03	Cu:70 Zn:30	Cu:60 Zn:40	Cu:Rem Zn:10 Ni:0.6 Sn:0.6 Fe:0.01 P:0.04	Cu:96.0 Ni:2.0 Zn:1.0 Sn:0.5 Si:0.5	Cu:96.0 Ni:2.0 Zn:1.0 Sn:0.5 Si:0.5	Cu:95.45 Ni:2.85 Zn:0.5 Sn:0.5 Si:0.7	Cu:99.3 Mg:0.7 P:0.005	Cu:98.4 Mg:1.6	Cu:99.7 Mg:0.25 P:0.002	Cu:99.5 Co:0.27 P:0.08 Sn:0.04 Ni:0.04	Cu:49 Ni:9 Mn:6 Zn:Rem.

NOTE: The physical properties are average.

Specific Gravity	8.94	8.94	8.94	8.9	8.9	8.9	8.9	8.9	8.8	8.53	8.39	8.8	8.9	8.9	8.9	8.8	8.5	8.9	8.9	8.3
Coeff. of Thermal Expansion [ $\times 10^{-6}/k$ ] (20~300°C)	17.7	17.7	17.7	17.7	17.7	17.1	17.7	17.7	17.6	19.9	20.8	18.4	17.1	17.1	17.1	17.3	18.2	17.8	17.7	17
Thermal Conductivity [W/(m·K)] (20°C)	391	391	339	360	347	1/2H;316 H;316 SH;287	373	347	262	121	121	138	194	160	180	264	174	340	330	29
Electrical Resistivity [ $\mu\Omega\cdot m$ ]	0.017	0.017	0.020	0.018	0.020	1/2H,H: 0.021 SH: 0.023	0.018	0.019	0.026	0.062	0.062	0.057	0.038	0.047	0.043	0.027	0.042	0.021	0.022	0.392
Electrical Conductivity [%IACS]	101	101	85	95	88	1/2H,H: 82 SH: 74	97	90	66	28	28	30	46	37	40	63	43	82	80	4.4
Modulus of Elasticity [kN/mm <sup>2</sup> ]	118	118	118	121	121	137	121	118	121	110	103	123	130	130	132	125	115	131	125	114

**Tensile Strength [N/mm<sup>2</sup>] (MPa=N/mm<sup>2</sup>, 1N/mm<sup>2</sup>=0.1451ksi)**

O	195~255	195~255	195~255				285Max.	255~335	345~415	275Min.	325Min.					390Max.			280~320	470~550
1/4H	215~275	215~275	215~275	275~315				275~355		325~410	355~440					365~450		270~370	310~380	
1/2H	245~315	245~315	245~315	295~355		500~600	245~295	295~375	365~435	355~440	410~490		450~550	540~640	660~800	420~510	485~585	320~420	430~520	530~630
3/4H				325~380						375~470										
H	275~345	275~345	275~345	365~430		555~655	295~355	335~410	415~480	410~540	470~570	500~600	500~600	600~700	750~850	480~570	530~630	360~460	480~570	600~700
EH	315Min.	315Min.	315Min.				355~410	375Min.	460~505	520~620	540Min.	550~650	540~640	640~740	800~900	540~630	575~675	420~520	540Min.	680Min.
SH				440~490	440~520	575~725	410~470		480~525	570~655	590Min.		600~700	700~800	850Min.	590Min.	620~720			
ESH									530~575	620Min.			700Min.	760Min.						

**0.2% Yield Strength [N/mm<sup>2</sup>] <Nominal 0.2% offset> (MPa=N/mm<sup>2</sup>, 1N/mm<sup>2</sup>=0.1451ksi)**

O																				200~280
1/4H																300~410		210~350		
1/2H						455~555			245~385				390~520	480~630	530~770	370~480	435~575	270~410	375~475	420~550
3/4H																				
H						530~630			365~470			450~550	440~580	540~690	710~830	440~550	470~620	310~460	450~550	520~650
EH									440~490			500~600	480~630	580~735	770~890	490~620	510~660	360~510	500Min.	600Min.
SH						530~705			460~515				540~690	650~780	800Min.	540Min.	555~705			
ESH									505~555				650Min.	740Min.						

**Elongation [%min]**

O	35	35	35				35	30	15	40	35					25			30	40
1/4H	25	25	25	13				20		35	25					15		10	20	
1/2H	15	15	15	6		6	6	10	5	28	15		8	8	9	10	5	6	5	25
3/4H				5						20										
H				4		3	4	5	2			7	6	5	6	7	4	3	2	15
EH							2					3	4	3	3	5	3	2	1	3
SH				2	5	2	2		4				2	2			3			
ESH									5											

**Vickers Hardness [HV] \* For reference**

O	(60Max.)	(60Max.)	(60Max.)				(70Max.)	(90Min.)	(100~125)	(60~80)	(85Min.)					(100Max.)			(70~95)	(110~130)
1/4H	(55~75)	(55~75)	(55~75)	(70~100)				(90~115)		(80~105)	(90~125)					(90~140)		(70~130)	(90~115)	
1/2H	(75~90)	(75~90)	(75~90)	(80~110)		(130~190)	(75~110)	(100~125)	(115~137)	(100~130)	(120~140)		(125~185)	(150~215)	(170~260)	(120~170)	(145~205)	(85~145)	(135~160)	(155~190)
3/4H				(100~120)						(120~145)										
H	(90~105)	(90~105)	(90~105)	(110~130)		(160~220)	(100~120)	(110~135)	(125~145)	(135~160)	(140~160)	(150~190)	(140~200)	(165~230)	(210~270)	(150~190)	(160~220)	(100~160)	(145~170)	(180~210)
EH	(100Min.)	(100Min.)	(100Min.)				(110~130)	(115Min.)	(135~150)	(155~175)	(160~190)	(160~210)	(150~215)	(180~240)	(220~280)	(170~210)	(175~235)	(110~170)	(160Min.)	(200Min.)
SH				(130Min.)	(130Min.)	(170Min.)	(125Min.)		(140~155)	(170~190)	(180Min.)		(165~230)	(200~250)	(230Min.)	(180Min.)	(190~250)			
ESH									(150~170)	(180Min.)			(200Min.)	(230Min.)						