

# 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.

MMC Alloy Name	OFC	MOFC-HR	TC	DC1B	ZC	C151	C151S	MZC1	TAMAC4	TAMAC194	B1	B3	MAX251	MAX251C	MSP1	MSP5	MSP8	HRSC	WNS7
JIS No.	C1020		C1100	C1220							C2600	C2801							
CDA No.	C10200	C10850	C11000	C12200	C15150	C15100	C15100	C18140(1/2H, H) C18141(SH)		C19400	C26000	C28000	C64725	C64725	C18665	C18670	C18661	C18625	C76800
Nominal Composition [wt%]	Cu:99.96Min.	Cu:99.96Min. Mg:0.006	Cu:99.90Min.	Cu:99.90Min. P:0.03	Cu:99.98 Zr:0.02	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:99.87 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: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: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	8.94	8.9	8.9	8.9	8.9	8.9	8.8	8.53	8.39	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	17.7	17.7	17.1	17.7	17.6	19.9	20.8	17.1	17.1	17.3	18.2	17.8	17.7	17
Thermal Conductivity [W/(m·K)] (20°C)	391	391	391	339	373	360	347	1/2H, H: 316 SH: 287	347	262	121	121	194	160	264	174	340	330	29
Electrical Resistivity [ $\mu\Omega \cdot m$ ]	0.017	0.017	0.017	0.020	0.018	0.018	0.020	1/2H, H: 0.021 SH: 0.023	0.019	0.026	0.062	0.062	0.038	0.047	0.027	0.042	0.021	0.022	0.392
Electrical Conductivity [%IACS]	101	101	101	85	97	95	88	1/2H, H: 82 SH: 74	90	66	28	28	46	37	63	43	82	80	4.4
Modulus of Elasticity [kN/mm <sup>2</sup> ]	118	119	118	118	121	121	121	137	118	121	110	103	130	130	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	215~275		275~315			275~355		325~410	355~440			365~450			270~370	310~380
1/2H	245~315	245~315	245~315	245~315	245~295	295~355		500~600	295~375	365~435	355~440	410~490	450~550	540~640	420~510	485~585	320~420	430~520	530~630
3/4H						325~380					375~470								
H	275~345	275~345	275~345	275~345	295~355	365~430		555~655	335~410	415~480	410~540	470min.	500~600	600~700	480~570	530~630	360~460	480~570	600~700
EH	315Min.	315~415	315Min.	315Min.	355~410				375Min.	460~505	520~620		540~640	640~740	540~630	575~675	420~520	540Min.	680Min.
SH		355~455			410~470	440~490	440~520	575~725		480~525	570~655		600~700	700~800	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) ※ Typical Values

O																			
1/4H															328			282	
1/2H								502						554	432	507	331		
3/4H																			
H								567						584	494	543	399		
EH														663	560	585	434		
SH						454	611									636			
ESH																			

**Elongation** [%min]

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

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

O	(60Max.)		(60Max.)	(60Max.)	(70Max.)				(70~90)	(100~125)	(60~80)				(100Max.)			(70~95)	(110~130)
1/4H	(55~75)	(50~90)	(55~75)	(55~75)		(70~100)			(90~115)		(80~105)	(85~145)			(90~140)			(70~130)	(90~115)
1/2H	(75~90)	(60~100)	(75~90)	(75~90)	(75~110)	(80~110)		(130~190)	(100~125)	(115~137)	(100~130)	(105~160)	(125~185)	(150~215)	(120~170)	(145~205)	(85~145)	(135~160)	(155~190)
3/4H						(100~120)					(120~145)								
H	(90~105)	(85~125)	(90~105)	(90~105)	(100~120)	(110~130)		(160~220)	(110~135)	(125~145)	(135~160)	(130Min.)	(140~200)	(165~230)	(150~190)	(160~220)	(100~160)	(145~170)	(180~210)
EH	(100Min.)	(95~135)	(100Min.)	(100Min.)	(110~130)				(115Min.)	(135~150)	(155~175)		(150~215)	(180~240)	(170~210)	(175~235)	(110~170)	(160Min.)	(200Min.)
SH		(105~145)			(125Min.)	(130Min.)	(130Min.)	(170Min.)		(140~155)	(170~190)		(165~230)	(200~250)	(180Min.)	(190~250)			
ESH										(150~170)	(180Min.)		(200Min.)	(230Min.)					