



Table 1. Chemical composition guidelines and comparisons of some aluminum alloy sand and permanent mold castings

Cross index								Chemical composition									
KS	JIS	ASTM	AA	DIN	BS	IS	GB	Cu	Zn	Mn	Ni	Pb	Sn	Fe	Si	Mg	Ti
AC1A	AC1A	C4A (A02950)	295.0	G(GK)- AlCu4Ti	-	-	ZLD 203	4.0 ~ 5.0	≤ 0.30 (0.2) ²	≤ 0.35 (0.1) ²	≤ 0.05 (-) ²	≤ 0.05	≤ 0.05 (0.01) ²	≤ 0.50 (0.6) ²	≤ 1.2	≤ 0.15 (0.03) ²	≤ 0.25 (0.20) ²
AC1B	AC1B	(A0.2040)	204.0	G(GK)- AlCu4TiMg	-	2280		4.0 ~ 5.0	≤ 0.10	≤ 0.10	≤ 0.05 (0.1) ¹	≤ 0.05	≤ 0.05	≤ 0.35	≤ 0.20	0.15 ~ 0.35	0.05 ~ 0.30
							ZLD 201	4.5~5.3	≤ 0.2	0.6~1.0	≤ 0.1	-	-	≤ 0.20	≤ 0.3	≤ 0.05	0.15 ~ 0.35
							ZLD 201A	4.8~5.3	≤ 0.1	0.6~1.0	≤ 0.05	-	-	≤ 0.10	≤ 0.05	≤ 0.05	0.15 ~ 0.35
AC2A	AC2A	-	-	-	-	4223 A		3.0~4.5 (2.8~3.8) ¹	≤ 0.55 (0.15) ¹	≤ 0.55 (0.2~0.6) ¹	≤ 0.30 (0.2) ¹	≤ 0.15 (0.1) ¹	≤ 0.05	≤ 0.8 (0.6) ¹	4.0~6.0	≤ 0.25 (0.5) ¹	≤ 0.20
AC2B	AC2B	SC64D (A03190)	319.0	-	LM-4	4223	ZLD 107	2.0~4.0 (3.5~4.5) ²	≤ 0.5 (0.2) ²	≤ 0.50 (0.2~0.6) ¹ (0.3) ²	≤ 0.35 (0.2) ¹ (-) ²	≤ 0.20 (0.1) ¹ (0.05) ²	≤ 0.10 (0.01) ²	≤ 0.10 (0.8) ¹ (0.4) ²	5.0~7.0 (4.0~6.0) ¹ (6.5~7.5) ²	≤ 0.50 (0.15) ¹ (0.05) ²	≤ 0.20 (-) ²
							ZLD 107	5.0~8.0	≤ 0.5	≤ 0.5	≤ 0.3	≤ 0.05	≤ 0.01	≤ 0.5	4.0~6.0	0.3~0.55	-
AC3A	AC3A	-	-	G(GK)- AlSi12 (3.2581)	LM-6	-	ZLD 102	≤ 0.25 (0.30) ²	≤ 0.30 (0.1) ²	≤ 0.35 (0.5) ²	≤ 0.10 (-) ²	≤ 0.10 (-) ²	≤ 0.10 (-) ²	≤ 0.8 (0.6) ²	10.0~13.0	≤ 0.15 (0.10) ²	≤ 0.20
AC4A	AC4A	-	-	G(GK)- AlSi10Mg (3.2581)	-	4635	ZLD 104	≤ 0.25 (0.1) ¹ (0.1) ²	≤ .25 (0.1) ¹	0.30~0.6 (0.3~0.7) ¹ (0.2~0.5) ²	≤ 0.10 (-) ²	≤ 0.10 (0.05) ²	≤ 0.05 (0.01)	≤ 0.55 (0.6) ¹ (0.45) ²	8.0~10.0 (10.0~13.0) ¹ (8.0~10.5) ²	0.30~0.6 (0.2~0.6) ¹ (0.2~0.4) ²	≤ 0.20 (-) ²
							ZLD 111	1.3~1.8	≤ 0.1	0.10~0.35	-	≤ 0.05	≤ 0.01	≤ 0.35	8.0~10.0	0.45~0.65	-
AC4B	AC4B	SC94 (A03330)	333.0	G(GK)- AlSi8Cu3 (3.2161)	-	-		2.0~4.0	≤ 1.0	≤ 0.50	≤ 0.35	≤ 0.20	≤ 0.10	≤ 1.0	7.0~10.0	≤ 0.50	≤ 0.20

Table 1. (Continued)

Cross Index								Chemical composition									
KS	JIS	ASTM	AA	DIN	BS	IS	GB	Cu	Zn	Mn	Ni	Pb	Sn	Fe	Si	Mg	Ti
AC4C	AC4C	SG70A (A03560)	356.0	-	LM-25	4450	ZLD 101	≤ 0.25 (0.1) ¹ (0.2) ²	≤ 0.35 (0.1) ¹ (0.2) ²	≤ 0.35 (0.3) ¹	≤ 0.10 (-) ²	≤ 0.10 (0.05) ²	≤ 0.05 (0.01) ²	≤ 0.55 (0.5) ¹ (0.45) ²	6.5~7.5	0.25~0.45 (0.20~0.45) ¹ (0.30~0.50) ²	≤ 0.20
AC4CH	AC4CH	SG70B (A13560)	A356.0	G(GK)- AlSi7Mg (3.2371)	-	-	ZLD 101A	≤ 0.20 (0.10) ²	≤ 0.10 (0.05) ²	≤ 0.10 (0.05) ²	≤ 0.05	≤ 0.05	≤ 0.05 (0.01) ²	≤ 0.20 (0.12) ²	6.5~7.5	0.20~0.40 (0.30~0.50) ²	≤ 0.20 (0.08~0.20) ²
-	-	357.0	357.0	-	-	-	ZLD 116	≤ 0.05 (0.3) ²	≤ 0.05 (0.3) ²	≤ 0.03 (0.1) ²	-	- (0.05) ²	- (0.01) ²	≤ 0.15 (0.5) ²	6.5~7.5 (6.5~8.5) ²	0.45~0.6 (0.4~0.6) ²	≤ 0.20 (-) ²
-	-	A357.0 (A13570)	A357.0	-	-	-	ZLD 114A	≤ 0.20 (-) ²	≤ 0.10 (-) ²	≤ 0.10	-	-	-	≤ 0.20 (0.15) ²	6.5~7.5	0.45~0.7 (0.50~0.65) ²	≤ 0.04~0.20 (-) ²
AC4D	AC4D	SC51A (A03551)	355.0	-	LM-16	4225	ZLD 105	1.0~1.5	≤ 0.30 (0.5) ¹	≤ 0.50	≤ 0.20 (0.3) ¹ (-) ²	≤ 0.10 (0.2) ¹ (0.05) ²	≤ 0.05 (0.1) ¹ (0.01) ²	≤ 0.6 (0.8) ¹ (0.45) ²	4.5~5.5 (4.5~6.0) ¹	0.40~0.6 (0.3~0.6) ¹ (0.45~0.65) ²	≤ 0.20 (-) ²
							ZLD 105A	1.0~1.5	≤ 0.10	-	-	≤ 0.05	≤ 0.01	≤ 0.15	4.5~5.5	0.50~0.65	-
							ZLD 106	1.0~1.5	≤ 0.20	-	-	≤ 0.05	≤ 0.01	≤ 0.5	7.5~8.5	0.35~0.55	-
AC5A	AC5A	CN42A (A02420)	242.0	-	-	2285		3.5~4.5	≤ 0.15 (0.1) ¹	≤ 0.35 (0.6) ¹	1.7~2.3	≤ 0.05	≤ 0.05	≤ 0.8 (0.7) ¹	≤ 0.6 (0.7) ¹	1.2~1.8	≤ 0.20
AC7A	AC7A	G4A (A05140)	514.0	G-AMg5 (3.3561)	LM-5	5230	ZLD 303	≤ 0.10	≤ 0.15 (0.1) ¹ (0.2) ²	≤ 0.6 (0.3~0.7) (0.2) ²	≤ 0.05 (0.1) ¹ (-) ²	≤ 0.05 (-) ²	≤ 0.05 (-) ²	≤ 0.30 (0.6) ¹ (0.45) ²	≤ 0.20 (0.3) ¹ (0.8~1.3) ²	3.5~5.5 (3.0~6.0) ¹ (4.6~5.6) ²	≤ 0.20
							ZLD 305	≤ 0.10	-	≤ 0.10	-	-	-	≤ 0.25	≤ 0.20	7.6~9.0	-
AC7B	AC7B	G10A (A05200)	520.0	G-AMg10 (3.3591)	LM-10	5500	ZLD 301	≤ 0.10	≤ 0.10 (0.15) ²	≤ 0.10 (0.15) ²	≤ 0.05 (0.1) ¹ (0.05) ²	≤ 0.05	≤ 0.05	≤ 0.30 (0.4) ¹ (0.25) ²	≤ 0.20 (0.25) ¹	9.5~11.0	≤ 0.20
AC8A	AC8A	SN112A (A03360)	336.0	-	LM-13	4652	ZLD 109	0.8~1.3 (0.7~1.5) ¹ (0.5~1.5) ²	≤ 0.15 (0.5) ¹ (0.2) ²	≤ 0.15 (0.5) ¹ (0.2) ²	0.8~1.5 (0.7~1.5) ¹ (-) ²	≤ 0.05 (0.1) ¹	≤ 0.05 (0.1) ¹ (0.01) ²	≤ 0.8 (1.0) ¹ (0.4) ²	11.0~13.0 (10.0~12.0) ¹	0.7~1.3 (0.8~1.5) ¹ (0.9~1.4) ²	≤ 0.20
AC8B	AC8B	SC103A (A03320)	332.0	-	LM-26	4525		2.0~4.0	≤ 0.50 (1.0) ¹	≤ 0.50	0.10~1.0 (1.0) ¹	≤ 0.10 (0.3) ¹	≤ 0.10	≤ 1.0 (1.2) ¹	8.5~10.5	0.50~1.5	≤ 0.20
AC8C	AC8C	SC103A (A03320)	332.0	-	-	-	ZLD 108	2.0~4.0 (1.0~2.0) ²	≤ 0.50 (0.2) ²	≤ 0.50 (0.3~0.9) ²	≤ 0.50 (0.3) ²	≤ 0.10 (0.05) ²	≤ 0.10 (0.01) ²	≤ 1.0 (0.4) ²	8.5~10.5 (11.0~13.0) ²	0.50~1.5 (0.5~1.0) ²	≤ 0.20
AC9A	AC9A	-	-	-	LM-29	-		0.50~1.5	≤ 0.20	≤ 0.50	0.50~1.5	≤ 0.10	≤ 0.10	≤ 0.8	22~24	0.50~1.5	≤ 0.20

Table 1. (Continued)

Cross Index								Chemical composition									
KS	JIS	ASTM	AA	DIN	BS	IS	GB	Cu	Zn	Mn	Ni	Pb	Sn	Fe	Si	Mg	Ti
AC9B	AC9B	-	-	-	-	-	ZLD 118	0.50~1.5 (1.0~2.0) ²	≤ 0.20 (0.1) ²	≤ 0.50 (0.3~0.5) ²	0.50~1.5 (-) ²	≤ 0.10 (0.05) ²	≤ 0.10	≤ 0.8 (0.5) ²	18~20 (19~22) ²	0.50~1.5 (0.5~0.8) ²	≤ 0.20
							ZLD 115	≤ 0.10	-	≤ 0.10	-	≤ 0.05	≤ 0.01	≤ 0.25	4.8~6.2	0.45~0.7	-
							ZLD 204A	4.6~5.3	≤ 0.10	-	-	-	-	≤ 0.13	≤ 0.05	≤ 0.05	-
							ZLD 205A	4.6~5.3	≤ 0.10	-	-	-	-	≤ 0.10	≤ 0.05	≤ 0.05	-
							ZLD 207	3.0~3.4	≤ 0.20	0.9~1.2	-	-	-	≤ 0.50	1.6~2.0	0.2~0.3	-
							ZLD 401	≤ 0.60	9.2~13.0	≤ 0.50	-	-	-	≤ 0.60	6.0~8.0	-	-
							ZLD 402	≤ 0.25	5.2~6.5	≤ 0.1	-	-	-	≤ 0.4	≤ 0.3	-	-
							ZLD 501	-	-	-	-	-	-	≤ 0.3	≤ 0.20	-	≤ 0.15

Notes:

1. ()¹ - IS standard, ()² - GB standard

2. Other contents

ZLD204A : Cd(0.15~0.25)/ ZLD205A : Zr(0.05~0.20), Cd(0.15~0.25), B(0.01~0.06), V(0.05~0.30)

ZLD207 : Ni(0.2~0.3), Zr(0.15~0.25), RE(4.5~5.0) / ZLD115 : Sb(0.1~0.25)

ZLD116 : Be(0.15~0.40) / ZLD118 : RE(0.6~1.5) / ZLD305 : Be(0.03~0.1) / ZLD402 : Cr(0.4~0.6)



Table 2. Chemical composition guidelines and comparisons of some aluminum alloy die castings

Cross index								Chemical composition									
KS	JIS	ASTM	AA	DIN	BS	IS	GB	Cu	Zn	Mn	Ni	Pb	Sn	Fe	Si	Mg	Ti
ALDC1	ADC1	S12A (A14130)	A413.0	GD-ALSi12(Cu) (3.2582)	LM-20	4600		≤ 1.0 (0.1) ¹	≤ 0.5 (0.1) ¹	≤ 0.3 (0.5) ¹	≤ 0.5 (0.1) ¹	- (0.1) ¹	≤ 0.1 (0.05) ¹	≤ 1.3 (0.6) ¹	11.0~13.0 (10.0~13.0) ¹	≤ 0.3 (0.1) ¹	- (0.2) ¹
-	-	-	-	-	-	4600A	YLD 102	≤ 0.4 (0.30) ²	≤ 0.20 (0.1) ²	≤ 0.5 (0.4) ²	≤ 0.10 (-) ²	≤ 0.10 (-) ²	(0.1) ¹ (-) ²	≤ 1.0 (0.9)	10.0~13.0	≤ 0.2 (0.25)	≤ 0.20 (-) ²
ALDC2	ADC3	SG100A (A13600)	A360.0	GD-ALSi10Mg(Cu) (3.2983)	-	-	YLD 104	≤ 0.6 (-) ²	≤ 0.5 (-) ²	≤ 0.3 (-) ²	≤ 0.5 (-) ²	- (0.05) ²	≤ 0.1 (0.01) ²	≤ 1.3 (0.8) ²	9.0~10.0 (8.0~10.5) ²	0.4~0.6 (0.2~0.35) ²	- (0.15) ²
ALDC3	ADC5	G8A (A05180)	518.0	-	-	-	YLD 302	≤ 0.2 (0.1) ²	≤ 0.1 (0.2) ²	≤ 0.3 (-) ²	≤ 0.1 (-) ²	-	≤ 0.1 (-) ²	≤ 1.8 (0.9) ²	≤ 0.3 (0.8~1.3) ²	4.0~8.5 (4.6~5.5) ²	-
ALDC4	ADC6	-	515.0	-	-	-	YLD 306	≤ 0.1	≤ 0.4	0.4~0.6 (-) ²	≤ 0.1	-	≤ 0.1	≤ 0.8 (0.6) ²	≤ 1.0	2.5~4.0 (2.6~4.0) ²	-
ALDC7	ADC10	-	B380.0	GD-ALSi8Cu3 (3.2162)	-	-	YLD 112	2.0~4.0 (2.5~4.0) ²	≤ 1.0	≤ 0.5 (0.3) ²	≤ 0.5	- (0.3) ²	≤ 0.3 (0.2) ²	≤ 1.3 (0.9) ²	7.5~9.5	≤ 0.3	- (0.2) ²
ALDC7Z	ADC10Z	SC84A (A13800)	A380.0	-	LM-24	4420		2.0~4.0 (3.0~4.0) ¹	≤ 3.0	≤ 0.5	≤ 0.5	- (0.3) ¹	≤ 0.3 (0.2) ¹	≤ 1.3	7.5~9.5	≤ 0.3	(0.2) ¹
ALDC8	ADC12	-	383.0	-	-	-	YLD 113	1.5~3.5 (2.0~3.5) ²	≤ 1.0 (0.8) ²	≤ 0.5	≤ 0.5	-	≤ 0.3 (0.2) ²	≤ 1.3 (0.9) ²	9.6~12.0	≤ 0.3	-
ALDC8Z	ADC12Z	SC102A (A03830)	A380.0	-	LM-2	4520		1.5~3.5 (0.7~2.5) ¹	≤ 3.0 (2.0) ¹	≤ 0.5	≤ 0.5	- (0.3) ¹	≤ 0.3 (0.2) ¹	≤ 1.3 (1.0) ¹	9.6~12.0 (9.0~11.5) ¹	≤ 0.3	(0.2) ¹
ALDC9	ADC14	SC174B (A23900)	B390.0	-	-	IS	YLD 117	4.0~5.0	≤ 1.5	≤ 0.5	≤ 0.3	-	≤ 0.3	≤ 1.3 (0.9) ²	16.0~18.0	0.45~0.65 (0.50~0.65) ²	-

Notes:

3. ()¹ - IS standard, ()² - GB standard