



Padaeng Die casting Ingot Specifications

Padaeng Alloy Ingot Designation -->

	DA-2	DA-3	DA-5	DA-8	DA-12	DA-27
Al	3.9 - 4.2	3.9 - 4.2	3.9 - 4.2	8.2 - 8.8	10.8 - 11.5	25.5 - 28.0
Mg	0.035 - 0.06	0.035 - 0.06	0.035 - 0.06	0.02 - 0.03	0.02 - 0.03	0.012 - 0.02
Cu	2.7 - 3.3	0.03 max	0.75 - 1.1	0.9 - 1.3	0.5 - 1.2	2.0 - 2.5
Pb	0.003 max	0.003 max	0.003 max	0.005 max	0.005 max	0.005 max
Cd	0.002 max	0.002 max	0.002 max	0.005 max	0.005 max	0.005 max
Fe	0.02 max	0.02 max	0.02 max	0.035 max	0.05 max	0.07 max
Sn	0.001 max	0.001 max	0.001 max	0.002 max	0.002 max	0.002 max
Ni	0.001 max	0.001 max	0.001 max	0.001 max		
Si	0.02 max	0.02 max	0.02 max	0.035 max	0.05 max	0.07 max
Zn	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.
		ZDC2	ZDC1			
		ZL2	ZL3	ZL5	ZL8	ZL12
		Zamak2	Zamak3	Zamak5	ZA8	ZA12
					ZA27	

Conforms to JIS H2210
 Conforms to EN 1774
 Conforms to ASTM B 240

Ingot Specification JIS H 2201

Japanese Alloy Ingot Designation -->

	ADAC-3	ZDC-2	ZDC-1			
Al	3.9-4.3	3.9-4.3	3.9-4.3			
Mg	.03-.06	.03-.06	.03-.06			
Cu	2.5- 3.5	.03max	.75-1.25			
Pb	.003 max	.003 max	.003 max			
Cd	.002 max	.002 max	.002 max			
Fe	.002 max	.075 max	.075 max			
Sn	.001 max	.001 max	.001 max			
Ni						
Si						
Zn	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.

Ingot Specification EN 1774 - 98

EN Alloy Ingot Designation -->

	ZL2	ZL3	ZL5	ZL8	ZL12	ZL27
Al	3.8 - 4.2	3.8 - 4.2	3.8 - 4.2	8.2 - 8.8	10.8 - 11.5	25.5 - 28.0
Mg	0.035 - 0.06	0.035 - 0.06	0.035 - 0.06	0.02 - 0.03	0.02 - 0.03	0.012 - 0.02
Cu	2.7 - 3.3	0.03 max	0.7 - 1.1	0.9 - 1.3	0.5 - 1.2	2.0 - 2.5
Pb	0.003 max	0.003 max	0.003 max	0.005 max	0.005 max	0.005 max
Cd	0.003 max	0.003 max	0.003 max	0.005 max	0.005 max	0.005 max
Fe	0.02 max	0.02 max	0.02 max	0.035 max	0.05 max	0.07 max
Sn	0.001 max	0.001 max	0.001 max	0.002 max	0.002 max	0.002 max
Ni	0.001 max	0.001 max	0.001 max	0.001 max		
Si	0.02 max	0.02 max	0.02 max	0.035 max	0.05 max	0.07 max
Zn	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.

Ingot Specification ASTM B 240-03

ASTM Alloy Ingot Designation -->

	Zamak2	Zamak3	Zamak5	ZA-8	ZA-12	ZA-27
Al	3.9-4.3	3.9-4.3	3.9-4.3	8.2-8.8	10.8-11.5	25.5-28.0
Mg	.025-.05	.025-.05	.03-.06	.020-.030	.020-.030	.012-.020
Cu	2.6 - 2.9	.10 max	.75-1.25	0.8-1.3	0.5-1.2	2.0-2.5
Pb	.004 max	.004 max	.004 max	.005 max	.005 max	.005 max
Cd	.003 max	.003 max	.003 max	.005 max	.005 max	.005 max
Fe	.075 max	.075 max	.075 max	.065 max	.065 max	.072 max
Sn	.002 max	.002 max	.002 max	.002 max	.002 max	.002 max
Ni						
Si						
Zn	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.

Alloy designation by different standards

BS EN 1774 1998 (alloy symbol)	ZnAl4Cu3	ZnAl4	ZnAl4Cu1	ZnAl8Cu1	ZnAl11Cu1	ZnAl27Cu2
BS EN 1774 1998 (alloy number)	ZL0430	ZL0400	ZL0410	ZL0810	ZL1110	ZL2720
BS EN 1774 1998 (short designation)	ZL2	ZL3	ZL5	ZL8	ZL12	ZL27
ASTM B 240 - 05 (UNS)	Z35540	Z33521	Z33530	Z35635	Z35630	Z35840
ASTM B 240 - 05 (ASTM)	AG43A	AG40A	AG41A			
ASTM B 240 - 05 (Common)	Alloy 2	Alloy 3	Alloy 5			
ASTM B 240 - 05 (Traditional)	Zamak 2	Zamak 3	Zamak 5	ZA-8	ZA-12	ZA-27
JIS H 2201 - 1999	ADAC-3	ZDC-2	ZDC-1			

Casting Specification BS EN 12844 - 1999

	ZP2	ZP3	ZP5	ZP8	ZP12	ZP27
Al	3.7 - 4.3	3.7 - 4.3	3.7 - 4.3	8.0 - 8.8	10.5 - 11.5	25 - 28
Mg	0.025 - 0.06	0.025 - 0.06	0.025 - 0.06	0.015 - 0.03	0.015 - 0.03	0.01 - 0.02
Cu	2.7 - 3.3	0.1 max	0.7 - 1.2	0.8 - 1.3	0.5 - 1.2	2.0 - 2.5
Pb	0.005 max	0.005 max	0.005 max	0.006 max	0.006 max	0.006 max
Cd	0.005 max	0.005 max	0.005 max	0.006 max	0.006 max	0.006 max
Fe	0.05 max	0.05 max	0.05 max	0.06 max	0.07 max	0.1 max
Sn	0.002 max	0.002 max	0.002 max	0.003 max	0.003 max	0.003 max
Ni	0.02 max	0.02 max	0.02 max	0.02 max	0.02 max	0.02 max
Si	0.03 max	0.03 max	0.03 max	0.045 max	0.06 max	0.08 max
Zn	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.
Casting - Mechanical & Property - EN Standard						
	ZP2	ZP3	ZP5	ZP8	ZP12	ZP27
Ultimate Tensile Strength: Mpa	359	280	330	370	400	425
Yield Strength - 0.2% Offset: Mpa	270	200	250	220	300	370
Elongation: % in 2"	5	10	5	8	5	2.5
Shear Strength: Mpa	317					
Hardness: Brinell	102	83	92	100	100	120
Impact Strength: J	59	57	58	40	30	10
Fatigue Strength Rotary Bend - 5x10 ⁸ cycles: Mpa	60	48	56	100		145
Compressive Yield Strength 0.1% Offset: Mpa	641					
Modulus of Elasticity - MPa x 103	85.5	85	85	86	82	78
Creep stress for 0.5% elongation Mpa	80	80	100	160	-	100
	ZP2	ZP3	ZP5	ZP8	ZP12	ZP27
Density: g/cm ³	6.80	6.70	6.70	6.30	6.00	5.00
Melting Range: °C	379-389	382-387	379-388	375-404	377-432	377-484
Electrical Conductivity: %IACS	25	26	26	28	28	30
Thermal Conductivity: W/m/hr/°C	104.7	113	110	115	116	126
Coeff of Thermal Expansn: 100-200°C µm/mm/°C	27.8	27	27	23	24	26
Specific Heat: J/kg/°C	419					
Pattern of Die Shrinkage: in/in	0.007					

	Zamak2	Zamak3	Zamak5	ZA-8	ZA-12	ZA-27
Al	3.5 - 4.3	3.5 - 4.3	3.5 - 4.3	8.0 - 8.8	10.5 - 11.5	25 - 28
Mg	0.02 - 0.05	0.02 - 0.05	0.03 - 0.08	0.015 - 0.03	0.015 - 0.03	0.01 - 0.02
Cu	2.5 - 3.0	0.25 max	0.75 - 1.25	0.8 - 1.3	0.5 - 1.2	2.0 - 2.5
Pb	0.005 max	0.005 max	0.005 max	0.006 max	0.006 max	0.006 max
Cd	0.004 max	0.004 max	0.004 max	0.006 max	0.006 max	0.006 max
Fe	0.1 max	0.1 max	0.1 max	0.075 max	0.075 max	0.075 max
Sn	0.003 max	0.003 max	0.003 max	0.003 max	0.003 max	0.003 max
Ni						
Si						
Zn	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.
Casting Specification ASTM B 86 - 05						
	Zamak2	Zamak3	Zamak5	ZA-8	ZA-12	ZA-27
Ultimate Tensile Strength: Mpa	359	283	328	374	404	425
Yield Strength - 0.2% Offset: Mpa	283	221	228	290	320	376
Elongation: % in 2"	7	10	7	6 to 10	4 to 7	1 to 3
Shear Strength: Mpa	317	214	262	275	296	325
Hardness: Brinell	100	82	91	103	100	119
Impact Strength: J	48	58	65	42		12.8
Fatigue Strength Rotary Bend - 5x10 ⁸ cycles: Mpa	59	47.6	56.5	103	117	145
Compressive Yield Strength 0.1% Offset: Mpa	641	414	600	269	269	385
Modulus of Elasticity - MPa x 103	85.5	85.5	85.5	85.5	82.7	77.9
Creep stress for 0.5% elongation Mpa						
	Zamak2	Zamak3	Zamak5	ZA-8	ZA-12	ZA-27
Density: g/cm ³	6.60	6.60	6.60	6.3	6.03	5.00
Melting Range: °C	379-390	381-387	380-386	375-404	377-432	375-487
Electrical Conductivity: %IACS	25	27	26	27.7	28.3	29.7
Thermal Conductivity: W/m/hr/°C	104.7	113	108.9	114.7	116.1	125.5
Coeff of Thermal Expansn: 100-200°C µm/mm/°C	27.8	27.4	27.4	23.3	24.2	26
Specific Heat: J/kg/°C	419	419	419	435	450	525
Pattern of Die Shrinkage: in/in	0.007	0.007	0.007	0.0075	0.0075	0.008

	ZP2	ZP3	ZP5	ZP8	ZP12	ZP27
Holding temperature middle control	415	415	420	435	510	560
Holding temperature range	410-425	410-425	410-425	420-440	500-540	530-570
Die temperature range	150-220	150-220	150-220	150-215	150-200	150-200

Recommendation for die casting process