

Mechanical Properties

Commercial	A360	A380	384	518	#3 Zinc	ZA-8	ZA-12	ZA-27
Tensile strength								
Ksi	46	47	48	45	41	54	59	62
(MPa)	(320)	(320)	(330)	(310)	(283)	(372)	(400)	(426)
Yield strength								
Ksi	24	23	24	28	32	41–43	45–48	52–55
(MPa)	(170)	(160)	(170)	(190)	(221)	(283–296)	(310–331)	(359–379)
Elongation								
% in 2"(51mm)	3.5	3.5	2.5	5.0	10	6–10	4–7	2.0–3.5
Hardness								
BHN	75	80	85	80	82	100–106	95–105	116–122
Shear strength								
Ksi	26	27	29	29	31	40	43	47
(MPa)	(180)	(190)	(200)	(200)	(214)	(275)	(296)	(325)

Physical Properties

Commercial	A360	A380	384	518	#3 Zinc	ZA-8	ZA-12	ZA-27
Density								
(lb/in ³)	0.095	0.098	0.102	0.093	0.24	0.227	0.218	0.181
(g/cm ³)	(2.63)	(2.71)	(2.82)	(2.57)	(6.6)	(6.3)	(6.03)	(5.0)
Electrical conductivity								
%IACS	29	23	22	24	27	27.7	28.3	29.7
Thermal conductivity								
BTU/ft hr °F	65.3	55.6	55.6	55.6	65.3	66.3	67.1	72.5
(W/m °k)	(113)	(96.2)	(96.2)	(96.2)	(113)	(115)	(116)	122.5
Coef. of thermal expansion								
μ in./in./ °F x 10 ⁻⁶	11.6	12.1	11.6	13.4	15.2	12.9	13.4	14.4
(μ m/m°k)	(21.0)	(21.8)	21.0	(24.1)	(27.4)	(23.2)	(24.1)	(26.0)

Chemical Specification

Commercial	A360	A380	384	518	#3 Zinc	ZA-8	ZA-12	ZA-27
Nominal composition	Mg 0.5 Si 9.5	Cu 30 Si 8.5	Cu 3.8 Si 11.0	Mg 8.0	Al 4.0 Mg 0.035	Al 8.4 Mg 0.023 Cu 1.0	Al 11.0 Mg 0.023 Cu .88	Al 27.0 Mg 0.015 Cu 2.25
Detailed composition								
Silicone (Si)	9.0–10.0	7.5–9.5	10.5–12.0	0.35	—	—	—	—
Iron (Fe)	1.3	1.3	1.3	1.8	0.10	0.075	0.075	0.075
Copper (Cu)	0.6	3.0–4.0	3.0–4.5	0.25	0.25 max	0.8–1.3	0.5–1.2	2–2.5
Manganese (Mn)	0.35	0.5	0.5	0.35	—	—	—	—
Magnesium (Mg)	0.4–0.6	0.10	0.10	7.5–8.5	.02–.05	.015–.030	.015–.030	.010–.020
Nickel (Ni)	0.5	0.5	0.5	0.15	—	—	—	—
Zinc (Zn)	0.5	3.0	3.0	0.15	Balance	Balance	Balance	Balance
Tin (Sn)	0.15	0.35	0.35	0.15	0.003	0.003	0.003	0.003
Cadmium (Cd)	—	—	—	—	0.004	0.006	0.006	0.006
Aluminum (Al)	Balance	Balance	Balance	Balance	3.5–4.3	8.0–8.8	10.5–11.5	25.0–28.0

Characteristics

On a scale from 1–5, with 1 being most desirable and 5 being the least desirable

Commercial	A360	A380	384	518	#3 Zinc	ZA-8	ZA-12	ZA-27
Resistance to hot cracking	1	2	2	5	1	2	3	4
Pressure tightness	2	2	2	5	1	3	3	4
Corrosion resistance	2	4	5	1	3	2	2	1
Ease and quality								
Machining	3	3	3	1	1	2	3	4
Polishing	3	3	3	1	1	2	3	4
Electroplating	2	1	2	5	1	1	2	3
Strength at elevated temperature	1	3	2	4	—	—	—	—
Die filling capacity	3	2	1	5	1	2	3	3
Anodizing	3	3	4	1	1	1	2	2