

Aluminum Alloys

Property	A380	A360	A413
Mechanical Properties			
Ultimate Tensile Strength (psi ×10 ³ (MPa))	47	46	42
Yield Strength – 0.2% Offset (psi ×10 ³ (MPa))	23	24	19
Elongation (% in 2")	3.50%	3.50%	3.50%
Shear Strength (psi ×10 ³ (MPa))	27	26	25
Hardness (Brinell)	80	80	80
Impact Strength (ft-lb (J))	3	—	
Fatigue Strength – Rotary Bend, 5×10 ⁸ cycles (psi ×10 ³ (MPa))	20	18	19
Compressive Yield Strength – 0.1% Offset (psi ×10 ³ (MPa))	—	—	
Modulus of Elasticity (psi ×10 ³ (MPa))	—	—	
Property			
Density (lb/cu in (g/cc))	0.098	0.095	0.096
Melting Range (°F)	1000–1100	1035–1105	1065-1085
Melting Range (°C)	—	—	574-582
Electrical Conductivity (% IACS)	27	30	31
Thermal Conductivity (BTU/ft/hr/°F (W/m/hr/°C))	55.6	70.15	
Coefficient of Thermal Expansion	11.7 (22)	11.6	11.3
Specific Heat	—	—	
Pattern Shrinkage (inches)	0.006	0.006	
Chemical Specification			
Al	Balance	Balance	Balance
Zn	2.9	0.4	0.5
Mg	0.1	0.45–0.60	0.1
Cu	3.0–4.0	0.6	1
Fe (max)	1.3	1.3	1.3
Pb (max)	—	—	
Cd (max)	—	—	
Sn (max)	0.3	0.15	0.15
Ni	0.5	0.5	0.5
Si	7.5–9.5	9.0–10.0	11.0-13.0
Industry Standard			
ASTM	SC84A	SG100A	S12A
SAE	306	309	305
Caldwell Casting Company			