A380 Aluminum

Die Casting Alloy Datasheet - AlSi9Cu3(Fe), as-cast, high-pressure die cast (HPDC)

KastMfg
Precision Die Casting

DESIGNATIONS & EQUIVALENTS

Standard	Designation
AA (Aluminum Association, USA)	380.0
ASTM B85 (USA)	Alloy 380 / A380.0
UNS	A13800
EN 1706 (Europe)	AC-46000 - AlSi9Cu3(Fe)
JIS H5302 (Japan)	ADC10 (similar, not identical)

Note: UNS A13800 per AA / ASTM B85. The EN equivalent is AC-46000 (AlSi9Cu3(Fe)); AC-46500 is compositionally close but is not an equivalent designation.

CHEMICAL COMPOSITION (WT%)

Element	Min %	Max %
Silicon (Si)	7.5	9.5
Copper (Cu)	3.0	4.0
Magnesium (Mg)	-	0.10
Iron (Fe)	-	1.3
Manganese (Mn)	-	0.50
Zinc (Zn)	-	3.0
Nickel (Ni)	-	0.50
Tin (Sn)	-	0.35
Aluminum (Al)	Balance	

Note: per ASTM B85 composition limits for Alloy 380.

MECHANICAL PROPERTIES (AS-CAST HPDC)

Property	Typical value
Tensile strength (UTS)	317 MPa (46,000 psi)
Yield strength (0.2% offset)	159 MPa (23,000 psi)
Elongation	3.5%
Hardness	80 HB
Shear strength	190 MPa (27,500 psi)
Fatigue strength (5x10^8 cycles)	138 MPa (20,000 psi)

Note: typical as-cast HPDC values; tensile and yield per ASTM E8, hardness per ASTM E10 (Brinell).

PHYSICAL PROPERTIES

Property	Typical value
Density	2.74 g/cm3 (0.099 lb/in3)
Melting range	~540-595 C
Thermal conductivity	~96-109 W/mK
Coefficient of thermal expansion	~21.1-22.0 x10^-6/K
Modulus of elasticity	~71 GPa

Note: typical values per published alloy data.

TYPICAL APPLICATIONS

- Transmission and engine housings, timing covers
- Structural brackets and mounting hardware
- Pump bodies and fluid-handling housings
- Motor housings and end shields
- Electronic enclosures and power-supply housings

- Heat sinks and LED/lighting housings

Typical values for separately cast test specimens, not guaranteed minimums. Contractual limits per the referenced standard.