A356.0
ALUMINIUM CASTING ALLOY
(7Si-0.3Mg)

Specifications

AMS. 356.0: 4217, 4260, 4261, 4284, 4285, 4286, A356.0: 4218
Former ASTM. 356.0, SG70A; A356.0, SG70B
SAE. 356.0: J452, 323
UNS number. 356.0: A03560. A356.0: A13560
Government. 356.0: QQ-A-601, QQ-A-596.
A356.0: MIL-C-21180 (Class 12)
Foreign. ISO:AlSi7Mg

Chemical Composition

Composition limits. 356.0: 0.25 Cu max, 0.20 to 0.45Mg, 0.35 Mn max, 6.5 to 7.5 Si, 0.6 Fe max, 0.35 Zn max, 0.25 Ti max, 0.05 other (each) max, 0.15 others (total) max, bal Al. A356.0: 0.20 Cu max, 0.25 to 0.45 Mg, 0.10 Mn max, 6.5 to 7.5 Si, 0.20 Fe max, 0.10 Zn max, 0.20 Ti max, 0.05 other (each) max, 0.15 others (total) max, bal Al.
Consequence of exceeding impurity limits. High copper or nickel decreases ductility and resistance to corrosion. High iron decreases strength and ductility.

Applications

Typical uses. 356.0 aircraft pump parts, automotive transmission cases, aircraft fittings and control parts, water-cooled cylinder blocks. Other applications where excellent castability and good weldability, pressure tightness, and good resistance to corrosion are required. A356.0: aircraft structures and engine controls, nuclear energy installations, and other applications where high-strength permanent mold or investment castings are required.

Mechanical Properties

0.2%. Proof Stress (N/mmº)	185
Tensile stress (N/mm_)	230
Elongation (%)	2
Impact	-
Brinell Hardness	75
Endurance Limit	56
Modulus of Elasticity	71
Shear strength	120

Properties in excess of those quoted can be obtained with Strontium additions e.g.- Elongation 5%

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Mass Characteristics

Density. 2.685 g/cm_ (0.097 lb/in_) at 20ºC (68ºF)

Thermal Properties

Liquidus temperature. 615ºC (1135ºF)
Solidus temperature. 555ºC (1035ºF)
Coefficient of linear thermal expansion.

Temperature range		Average coefficient	
ºC	ºF	p.m/mK	p.in/in. ºF
20-100	68-212	21.5	11.9
20-200	68-392	22.5	12.5
20-300	68-572	23.5	13.1

Specific heat. 963 J/kg . K (0.230 Btu/lb.ºF) at 100ºC (212º)
Latent heat of fusion. 389kJ/kg
Thermal conductivity. At 25 ºC (77ºF)

Minimum mechanical properties for alloy A356.0-T61 castings

	Tensile strength		Tensile yield strength (b)(c)			Compressive yield strenght (e)	
Class	MPa	Ksi	MPa	Ksi	Elongation (d) %	MPa	Ksi
1	260	38	195	28	5	195	28
2	275	40	205	30	3	205	30
3	310	45	235	34	3	235	34
10	260	38	195	28	5	195	28
11	230	33	185	27	3	185	27
12	220	32	150	22	2	150	22

(a) Classes 1,2, and 3 (levels) of properties) obtainable only at designated areas of casting; classes 10,11 and 12 may be specificied at any location in casting. (b) Specified in MIL-A-21180. (C) 0.2% offset. (d) in 4d. where d is diameter of reduced section of tensile-test specimen. (e) Design values; not specified