

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/mm ²)	185
Tensile stress (N/mm ²)	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%



BS2L99 ALUMINIUM CASTING ALLOY (A1-Si7Mg0.3)

PHYSICAL PROPERTIES

Coefficient of Thermal Expansion (per° C at 20-100°C)	0.000022
Thermal Conductivity (cal/cm_°C at 25°C)	0.36
Electrical Conductivity (% copper standard at 20°C)	39
Density (g/cm_)	2.68
Freezing Range (°C)approx	615-550

MACHINABILITY

The heat-treated alloy has fairly good machining properties, but tools should preferably be of high speed steel, and must be kept sharp. A moderately high rate of tool wear may be expected. Liberal cutting lubricant should be employed.

CORROSION RESISTANCE

Resistance to corrosive attack by sea water and marine atmospheres is high.

ANODIZING

A protective anodic film can be obtained by either the sulphuric or chromic acid process but the grey opaque character of the coatings of normal thickness precludes their colouring in light shades for decorative purposes.

CASTING CHARACTERISTICS

FLUIDITY – Good, suitable for fairly thin castings.

PRESSURE TIGHTNESS – Good, suitable for castings required to be leak tight.

HOT-TEARING – Excellent. Problems due to hot tearing are seldom encountered.

TYPICAL POURING TEMPERATURE - 710° C

The practical temperature may range between 675-790° C, depending on the mould configuration.

PATTERNMAKERS' SHRINKAGE – 1.3% OR 1/75

HEAT TREATMENT

BL 2L99 (fully heat treated) – Heat for not less than 12 hours at 535-545°C, quench in water at not less than 65°C, or in a polymer quenchant not hotter than 30° C, followed by a precipitation treatment of not less than 4 hours at 150-160°C and air cool.

APPLICATIONS

2L99 alloy is mainly used where good mechanical properties are required in castings of a shape or dimensions requiring and alloy of excellent castability in order to achieve the desired standard of soundness. The alloy is also used where resistance to corrosion is an important consideration, particularly where high strength is required. It is used for aircraft pump parts, aircraft fittings and control parts, aircraft structures and engine controls.