

BAIENWEI SILICON ALUMINUM ALLOYS

FOR NEW PACKAGING AND THERMAL MANAGEMENT



The only company delivering industry-leading
Silicon Aluminum alloys

□ About Baienwei Profile

Baienwei Co.,Ltd is a professional high-tech manufacturer with a collection of R&D, production and marketing. The company adopts advanced Rapid Solidification technology and specializing in the production of silicon aluminum (AlSi) alloys.

Silicon aluminum (AlSi) alloys is a kind of binary alloy consisting of silicon and aluminum. Typical products are AlSi50 and AlSi60. The material are homogeneous and stable, having the advantages of low density, low coefficient of thermal expansion, high thermal conductivity and outstanding mechanical properties. Making critical contribution to the aerospace, defense, satellite communication, automotive and other leading-edge industry. It can be directly replace Kovar, Cu-W, Cu-Mo and AlSiC in some electronic fields.

The company has passed ISO9001:2008 QMS and China national military standard (GJB) Certificate and achieved portfolio of products and technology patents. Baienwei offers exclusive and customized services according to customers' industry attributes

□ Vision Statement

To become a trusted Silicon Aluminum alloys and rapid solidification technology company that offers cutting-edge, high quality, superior performance and cost efficiency products to industry.

FEATURES&MANUFACTURING

LOW CTE, ADJUSTABLE

CTE from 7ppm/°C to 23ppm/°C

HIGH THERMAL CONDUCTIVITY

Up to 210W/m.K

LIGHTWEIGHT

Up to 10% lighter than pure aluminum

EASE OF MACHINABLE&PLATABLE

Excellent CNC/EDM characteristics&platable with Au/Ag/Ni/Ti

EXCELLENT THERMO-MECHANICAL STABILITY

Up to 500°C

HIGH STIFFNESS VALUES

Specific stiffness up to 54GPa.cm³/g

MATERIAL ENVIRONMENTAL

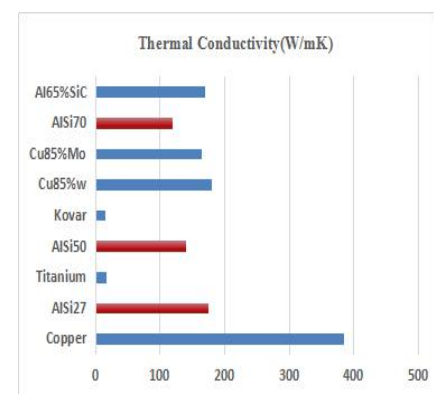
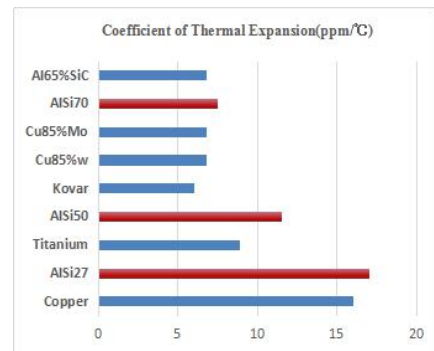
Non-toxic material

SHORT LEADING TIME

Typically 1-5 working days reply on complexity

COST EFFICIENCY, PROTOTYPE COMPONENTS

No dies required



Physical/Mechanical Properties:

Grade	Content	Density g/cm ³	CTE ppm/°C	Thermal Conductivity W/mK	Tensile Strength MPa	Yield Strength MPa	Poisson's Ratio	Elongation %	Elastic Modulus GPa
AlSi27	Al-27%Si	2.6	17	175	170	130	0.29	3.8	91
AlSi42	Al-42%Si	2.55	13.5	143	200	187	0.29	1	105
AlSi50	Al-50%Si	2.5	11.5	140	220	210	0.28	<1	108
AlSi60	Al-60%Si	2.46	9	125	181	181	0.27	<1	121
AlSi70	Al-70%Si	2.43	7.5	120	138	138	0.25	<1	131

Grade	Density g/cm ³	CTE ppm/°C	Thermal Conductivity W/mK	Tensile Strength MPa	Yield Strength MPa	Poisson's Ratio	Elongation %	Elastic Modulus GPa
Al6061	2.7	22.6	210	312	270	0.33	12.5	69
Al4047	2.66	21.6	193	208	129	0.33	18	70

Performace of AlSi alloys for Auto Accessories

Grade	Si content	Condition	Density g/cm ³	CTE 25°C ppm/°C	Tensile Strength MPa	Yield Strength MPa	Elongation %	Hardness HV30	Elastic Modulus GPa
AlSi17	17%	T6	2.83	18	486	412	0.5	181	91
AlSi20	0.2	F	2.78	17	335	206	2.7	106	96
AlSi25	25%	T6	2.64	16.9	480	441	0.7	190	96

Values above are for guidance only and the suitability of a material for a specific application can be confirmed only when we know the actual service condition.

Typical Application

▲ High Silicon Aluminum Alloys



AISi27

AISi42

AISi50

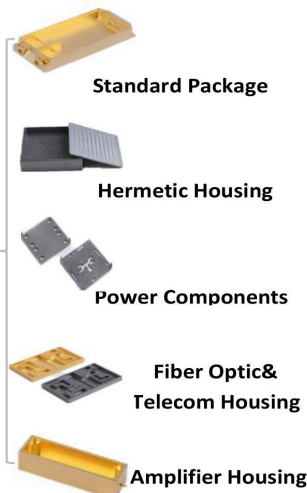
AISi60

AISi70

Al6061

Al4047

Electronic Packages



Standard Package

Hermetic Housing

Power Components

Fiber Optic & Telecom Housing

Amplifier Housing

Auto Parts



Cylinder Liners

Pistons

Inlet Valves & Valves Retainers

Brake Disc

Brake Callipers

▲ Super High Strength Aluminum Alloys



Sport Equipment Components



Aviation Aluminum Alloys



Power Structural Components



Aerospace Structural Components



Drilling Pipes

Baienwei Patented Spray Forming Technology AlSi Alloys



AlSi25 (Al-Si Alloys Raw Material)

- Low density
- High stiffness and fatigue resistance
- Ease of machinable&weldable
- Be widely used in auto accessories,like cylinder liner/piston/brake disc etc



AlSi27 (Al-Si Alloys Raw Material)

- Replace Al6061&copper in PCBS for high-frequency area
- Replace Kovar in optoelectronics industry
- Telecom/RFµwave/millimeter wave field



AlSi35 (Al-Si Alloys Raw Material)

- Replace Al6061&copper in PCBS for high-frequency area
- Replace Kovar in optoelectronics industry
- Telecom/RF/microwave/millimeter wave field



AlSi42 (Al-Si Alloys Raw Material)

- High thermal conductivity
- Lightweight
- Ease of machinable&platable
- Be used in hybrid electronic&satellite communication



AlSi50 (Al-Si Alloys Raw Material)

- Lightweight
- High electronic conductivity,excellent EMI/RF shielding performance
- Hybrid electronic&satellite communication



AlSi60 (Al-Si Alloys Raw Material)

- Lightweight
- High thermal conductivity
- CTE compatible with chips
- Be used in Radar&Optical industry



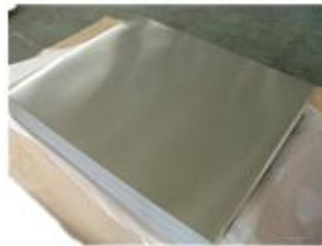
ALUMINUM ALLOY 4047/AISi12 (Al-Si Alloys Raw Material)

- Good corrosion resistance
- Lightweight
- Smooth finishes
- Welding filler wires/liners/millimeter wave field
- Laser welded covers for microwave integrated circuits



ALUMINUM ALLOY 6061 (Al-Si Alloys Raw Material)

- Good corrosion resistance
- Lightweight
- Smooth finishes
- Aircraft fittings/coupling/electronic fittings and connector/camera lens mouths



STANDARD PACKAGE (Al-Si alloy Electronic Packages)

- Controlled CTE, compatible with assembly components
- Lightweight
- Alternative Kovar/Co-W/Co-Mo
- Transmitter module/power electronic devices



AMPLIFIER HOUSING (Al-Si alloy Electronic Packages)

- CTE matched to optical devices&passive elements
- High thermal conductivity
- Low thermal distortion
- Excellent machinable/weldable
- Optical substrates and lens



OPTOELECTRONIC (Al-Si alloy Electronic Packages)

- Adjustable CTE with different laser material
- High thermal conductivity
- Low thermal distortion
- High-precision reflection of CTE that matches with surface Nickel
- IR Image component/Optical substrate/detector



HERMETIC HOUSING (Al-Si alloy Electronic Packages)

- Adjustable CTE match with circuit board&assembly components
- Low density
- Hermetically
- Excellent thermo-mechanical stability
- T/R modules&RF/microwave housing and other carriers



POWER COMPONENTS (Al-Si alloy Electronic Packages)

- Low density
- High thermal conductivity
- Served as semiconductor equipment/electrical power systems/DC converter etc



MICROELECTRONIC PACKAGE (Al-Si alloy Electronic Packages)

- Excellent heat-dissipation
- High thermal conductivity
- Dense and hermetic
- Dimensional stability
- Be found in Radar module/CPU and DSC chips/hybrid housing and carrier



FIBER OPTIC&TELECOM HOUSING (Al-Si alloy Electronic Packages)

- Excellent heat-dissipation
- High thermal conductivity
- Dense and hermetic
- Dimensional stability
- Be found in Radar module/CPU and DSC chips/hybrid housing and carrier



CYLINDER LINERS (Al-Si alloy Auto Parts)

- Low density
- High thermal conductivity
- Lightweight
- Excellent thermo-mechanical stability



PISTONS (Al-Si alloy Auto Parts)

- Low density
- 1/3 lightweight compared to cast iron
- Excellent anti-vibration
- High strength



INLET VALVES&VALVE RETAINERS (Al-Si alloy Auto Parts)

- High strength
- Wear-resistance
- Low density
- Good thermo-mechanical stability



BRAKE DISCS (Al-Si alloy Auto Parts)

- Low density and high thermal conductivity
- Up to 50%~60% in weight reduction
- Excellent wear-resistance and reliable fatigue
- Good heat-dissipation



BRAKE CALLIPERS (Al-Si alloy Auto Parts)

- Low density and high thermal conductivity
- Excellent wear-resistance and reliable fatigue
- Good thermo-mechanical stability



ROTORS&VANES (Al-Si alloy Auto Parts)

- High strength
- Excellent wear-resistance and reliable fatigue
- Low density



BEARING BRACKETS (Al-Si alloy Auto Parts)

- High strength
- Excellent wear-resistance
- Good formability
- Low density



CONNECTING RODS (Al-Si alloy Auto Parts)

- High strength
- Excellent wear-resistance
- Good formability
- Low density



DRILLING PIPERS (Super High Strength Aluminum Alloys)

- 1/3 lightweight of steel drilling pipe
- H₂S&CO₂ corrosion resistance
- Perfect fatigue strength
- Little friction resistance



AVIATION ALUMINUM ALLOYS (Super High Strength Aluminum Alloys)

- High strength&hardness
- Excellent corrosion resistance
- High fatigue strength
- Ease of machinable



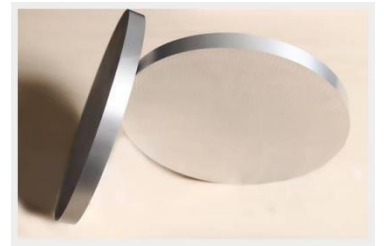
SPORT EQUIPMENT COMPONENTS (Super High Strength Aluminum Alloys)

- High strength&hardness
- Excellent corrosion resistance
- High fatigue strength
- Ease of machinable



POWER STRUCTURAL COMPONENTS (Super High Strength Aluminum Alloys)

- Super high strength&hardness
- Good corrosion resistance
- Lightweight
- Excellent forming and processing performance



AEROSPACE STRUCTURAL COMPONENTS (Super High Strength Aluminum Alloys)

- High strength&hardness
- Excellent corrosion resistance
- High fatigue strength
- Ease of machinable

