

ALUMINUM-SILICON-COPPER 319.0

ANSI AA NUMBER	319.0		
Common Name (Not recommended)			
UNS Designation	A03190		
COMPOSITION PERCENT	Min		Max
Silicon (Si)	5.5		6.5
Iron (Fe)			1.0
Copper (Cu)	3		4.0
Manganese (Mn)			0.5
Magnesium (Mg)			0.1
Chromium (Cr)			
Nickel (Ni)			0.35
Zinc (Zn)			1
Titanium (Ti)			0.25
Tin (Sn)			
Beryllium (Be)			
Silver (Ag)			
Other (Total)			0.5
NEAREST APPLICABLE CASTING STANDARDS			
ASTM (B Series)	B26		
SAE (J Series)			
Federal (QQ-C- Series)	601e		
Military (Mil-C- Series)	21180c		
MINIMUM PROPERTIES	F	T5	T6
Tensile Strength (ksi)	27	30	36
Yield Strength (.5% extension under load) (ksi)	18	26	24
Elongation (2 inch gauge length) (%)	2	1.5	2
Compressive Yield Strength (ksi)	19	27	25
Hardness (Brinell) (HB @ 500kg)	70	80	80
Shear Strength (ksi)	22	24	29
Endurance Limit (K ksi)	10	11	11
Modulus of Elasticity (K ksi)	10.7	10.7	10.7
Density (lb/cu.in. @ 68F)	.101		
Electrical Conductivity (% IACS @ 68F)	27		
Thermal Conductivity (cal/sec/sq cm/cm/C @ 25C)	0.26		
Coefficient of Thermal Expansion (per F @ 68-212F)	11.9		
Coefficient of Thermal Expansion (per F @ 68-572F)	12.7		
Melting Range (Liquidus-Solidus)(F)	960-1120		
Resistance to Hot Cracking	VG		
Pressure Tightness	VG		
Fluidity	VG		
Solidification Shrinkage Tendency	VG		
Strength at Elevated Temperatures	G		
Corrosion Resistance	G		
Machinability	G		
Polishing	F		
Gas Welding	VG		
Arc Welding	VG		
Brazing	No		
Normally Heat Treated	Optional		
Anodizing Appearance	Gray		
Electroplating	VG		
Applications:	Rear axle housings, engine parts, impellers, aircraft fittings, water jackets, crank cases, electric motor parts, engine blocks, jet engine compressor cases, transmission cases, flywheel housings, airframe castings, missile components. 319.0 is one of the most widely used aluminum alloys. Strontium modification of 319.0 can hasten room temperature aging.		

Always use the design principles outlined on page two of this information sheet or at our website.

Consult your foundry early in the design process.

We routinely pour and inventory this alloy.



**St. Paul
Brass and Aluminum
Foundry**

Use Good Design Principles

1. St. Paul Brass and Aluminum Foundry is providing this information on metal characteristics for informational purposes only. Before making a final decision on alloy selection consider the following and all other appropriate design and specification principles. Please note that this is not an exhaustive list.
2. Consult the appropriate specification from an accredited specifying body (ASTM, SAE, Federal or Military) to determine current minimum values of this alloy.
3. Use appropriate design safety factors.
4. Use Failure Modes and Effects Analysis to help identify possible weaknesses in designs and specifications.
5. Use computerized stress analysis tools.
6. Use appropriate certification requirements for your casting suppliers. These may include test bars, chemical certifications, radiography, dye penetrant or other non-destructive testing methods.
7. Test your design to failure in a controlled environment. Then test it to failure in a simulation of its end use.
8. You and you alone are responsible for the suitability of your design and the materials that you select.
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