

PUREFLOW 96SC LEAD FREE SOLDER ALLOY FOR WAVE SOLDERING

Only available from your officially appointed Multicore agent

- An all-round lead free alternative
- Proven in production use for electronics manufacturing
- Lowest melting high-tin, lead-free alloy, without undesirable additions
- Eutectic alloy (no melting range)

Applications

Pureflow 96SC alloy is designed to be substituted for tin/lead alloys in electronics assembly soldering operations. Some adjustment to equipment settings will be required but the resulting soldered joints will perform as well as tin/lead solder joints in most respects.

Pureflow 96SC alloy eliminates the handling and waste management hazards due to lead, for operators using conventional lead-containing alloys. Where lead has also been eliminated from other coating and soldering processes in PCB and component manufacture, the use of Pureflow 96SC will ensure that RoHS compliant lead-free assemblies are produced.

Recommended Operating Conditions

Pureflow 96SC is a proprietary alloy of composition 95.5% tin/3.8% silver/0.7% copper. It may be regarded as a refinement of the established Sn96.5/Ag3.5 (Sn96, 96S) binary eutectic alloy. Although many solutions have been proposed to meet the requirements for a lead free alloy to replace standard tin-lead solders, Pureflow 96SC offers significant benefits to users over the main alternatives, as indicated in the following comparison table:

Alternative Alloy	Potential problems in implementation
Tin-Copper eutectic	Viable option but poorer wetting characteristics, and inferior mechanical properties.
Tin-Silver eutectic	Viable option but higher melting temperature than TSC and no inhibition to copper dissolution.
Tin-Antimony	Suitable for engineering soldering but melting temperature too high for electronics assembly.
Tin-Silver-Copper-Antimony	Antimony addition has no proven value and raises melting point.

Temperature profiles designed for tin/lead alloys will need to be revised accordingly to cater for the melting point of Pureflow 96SC being 38°C higher than that of tin/lead eutectic alloy, though the superheat needed has been found to be less than that required for tin-lead.

Technical Specification

Test data indicate that the physical and mechanical properties and wetting behaviour of Pureflow 96SC alloy are comparable to those of tin/lead eutectic or near eutectic alloys, and in most cases considerably improved over other lead-free alloys.

Typical Alloy Composition:

Element	Content %
Zn	<0.001
Al	<0.001
Cd	<0.001
Au	<0.001
Ni	<0.001
Fe	<0.005
As	<0.005
In	<0.005
Pb	<0.05
Sb	<0.01
Bi	<0.005
Others	<0.10
Cu	0.7 ± 0.1
Ag	3.8 ± 0.2
Sn	Remainder

Physical and mechanical properties of Pureflow 96SC alloy compared to other lead-free alloys and Sn63Pb37

Property	Pureflow 96SC	Sn63 Pb37	Sn96.5 Ag3.5	Sn99.3 Cu0.7
Melting Point °C	217	183	221	227
°F	423	361	430	441
Electrical conductivity, %IACS	13	11.9	14	-
Electrical resistivity, $\mu\Omega\text{cm}$	13	14.5	12.3	-
Brinell hardness, HB	15	17	15	-
Density, g mm ³	7.5	8.4	7.5	7.3
Tensile strength, 20°C N mm ⁻² at 0.004s ⁻¹ strain rate	48	40	58	-
Joint shear strength N mm ⁻² at 0.1mm min ⁻¹ , 20°C	27	23	27	23
N mm ⁻² at 0.1mm min ⁻¹ , 100°C	17	14	17	16
Creep strength + N mm ⁻² 20°C	13.0	3.3	13.7	8.6
N mm ⁻² 100°C	5.0	1.0	5.0	2.1

+ Shear stress for 10³ hours to failure

Product Range

Pureflow 96SC is a lead-free substitute for eutectic and near eutectic tin/lead solders. This alloy is supplied in 1kg bars or 5kg autofeed ingots. Please contact our sales team for further details.

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