



SC995e™ Lead Free Water Soluble Wire Solder Product Bulletin

High Purity Wire Solder Improves Process

Metallic Resources' SC995e lead free water soluble wire solder is used for touchup applications when correcting defects on printed circuit boards. The SC995e alloy is comprised of Sn99.5/Cu0.5/Co and is manufactured to far exceed the most common specification requirements. It is **RoHS compliant** and does not contain any substances of very high concern (SVHC). It is **halogen free**.

Standard diameters include .015", .020", .032", and .062" wire with 2.2% flux. Other flux concentrations (1.1% and 3.3%) are available upon special order. Standard packaging includes 25 pounds per box on one pound spools. Five pound spools and heavier pay-off packs are also available.

A Wide Range of Uses

Metallic Resources' SC995e lead free water soluble wire solder is specially designed for use in all hand soldering applications. It is primarily used for manual soldering and repair work of printed circuit board assembly operations common to the electronics market.

Engineered for Ease of Use

Solder iron tip temperatures should be in a range of 650 to 850°F (343 to 454°C) for best results. The solder iron should be held at a 45° to 60° angle to the work surface. The iron should contact both the PCB pad surface and the component lead. The solder and flux should flow onto both the lead and pad (or barrel) to achieve the best flux activity for the joint being worked.



All water soluble fluxes tend to absorb moisture and some spattering is to be expected. Flux spattering can be minimized by applying the solder wire between the joint to be soldered and the soldering tip of the iron. Cored wire solder should not be directly applied to the tip of the soldering iron. After the re-work application, the flux residue on the board must be cleaned and removed with hot distilled or deionized water (140°F or 60°C minimum).

The product shelf life is indefinite when stored in a clean, dry area (72°F ± 10°F) away from moisture and sunlight. Do not store near fire or flames.

Standards Met

Metallic Resources' SC995e lead free water soluble wire solder passes BELLCORE and IPC standards and meets MIL SPEC requirements. Supporting documentation is available upon request. It is Telecommunications acceptable. The flux classification per IPC J-STD-004 is ORH1. The Surface Insulation Resistance (SIR) is 1.49×10^{10} ohms.



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Independent Testing

Thermal Shock

-10 to +100°C >1000 cycles

Temperature/Humidity

85°C/85% RH with Bias > 500 hrs.
No Tin Whiskers observed

Density

7.4g/cm³

Tension Testing

Tensile Strength = 28 MPa
Yield Strength = 21 MPa
Elongation-at-break = 27%

Wetting Balance Test

Max. Wetting Force = 0.31 mN/mm at 265°C
Time to Max. Wetting Force = 0.25 seconds

Specific Heat Capacity

Specific Heat Capacity = 295 J/kg . K

Thermal Conductivity and

Thermal Diffusivity Tests

Thermal Conductivity = 81.75 W/m.K at 25°C
Thermal Diffusivity = 3.817x 10⁻⁵ m²/s at 25°C

Coefficient of Thermal Expansion

Coefficient of thermal expansion, α , = 3.47x10⁻³ mm/mm°C in range of 25-200°C

Electric Resistivity

Electrical Resistivity = 0.123 m Ω m at 25°C

Alloy SC995e (Sn99.5/Cu0.5/Co)			
	J-STD-006B	MRI Specs	MRI Typical Analysis
Sn	99.5000 (\pm 0.5)	99.3-99.7	99.6000
As	0.0300	0.0035 (max)	0.0015
Sb	0.2000	0.0250 (max)	0.0150
Au	0.0500	0.0002 (max)	0.0002
Fe	0.0200	0.0050 (max)	0.0030
Ni	0.0100	0.0060 (max)	0.0030
Bi	0.1000	0.0100 (max)	0.0040
Al	0.0050	0.0010 (max)	0.0001
Cu	0.5000 (\pm 0.1)	0.5000 (\pm 0.1)	0.5000
Ag	0.1000	0.0010 (max)	0.0001
Zn	0.0030	0.0010 (max)	0.0005
Cd	0.0020	0.0010 (max)	0.0005
In	0.1000	0.0100 (max)	0.0050
Pb	0.1000	0.0500 (max)	0.0250
Co	N/A	<0.1000	<0.1000

Copper Loading Capacity of Solder

Sn63/Pb37 alloy

Temp:	°F	440	480	500	520	-----
	°C	226	248	260	271	-----
Cu conc. (wt.%) at beginning of level off (saturation) point		0.21	0.4	0.44	0.46	-----
Cu dissolution rate as % increase of Cu in solder pot		0.001	0.002	0.0022	0.0023	-----

99.5Sn/Cu0.5/Co lead-free alloy

Temp:	°F	490	500	510	520	530
	°C	254	260	265	271	276
Cu conc. (wt.%) at beginning of level off (saturation) point		0.7	0.8	0.824	0.887	1.01
Cu dissolution rate as % increase of Cu in solder pot		0.0014	0.0017	0.002	0.0021	0.0037

SnCuCo-0911

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