



# SN100e™

## PRODUCT BULLETIN BAR SOLDER

### Purity Improves Process

Qualitek's lead free solder SN100e is manufactured from tin, copper, and cobalt processed to create a solder that exceeds the most common purity specification requirements. The lead-free solder alloy is Sn99.5/Cu0.5/Co. It is RoHS compliant. The melting point is 228°C approx. and the recommended operating temperatures are between 260-270°C.

### Versatile Uses

SN100e is specially designed for use in all wave soldering and tin and dip soldering applications. It is primarily used in printed circuit board assembly operations common to the electronics market.

### Less Dross and Re-Work

This alloy provides brighter, shinier, less grainy solder joints when compared to (SAC 305) Sn96.5/Ag3.0/Cu0.5 alloy. It is much less expensive. Less solder is consumed compared to tin lead solder because the weight per cubic inch of the solder is lower. The lower viscosity improves the fluidity, which in turn improves the LF solder's wetting capability and reduces necessary re-work including bridging, icling, cobwebbing and flagging. High purity LF solder is environmentally friendly, and generates less dross compared to all other "virgin grade" solders. Less dross generation results in more soldered joints per pound of solder and greater cost-effectiveness through less waste. Generated dross has less solder content for minimal solder loss, more efficient product usage, and greater economy.

Qualitek's manufacturing process assures batch-to batch consistency for predictable solder performance.

### Certified

Certificates of Conformance and Analysis are automatically provided with each shipment.

Qualitek's SN100e solders meet or exceed the rigid requirements of Specification J-STD-006.



### 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/cm<sup>3</sup>

#### 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 = 295J/kg.K

#### Thermal Conductivity and Diffusivity Tests

Thermal Conductivity = 81.75 W/m.K at 25°C

Thermal Diffusivity = 3.817 x 10<sup>-5</sup> m<sup>2</sup>/s at 25°C

#### Coefficient of Thermal Expansion

Coefficient of thermal expansion,  $\alpha$ , = 22x10<sup>-6</sup> mm/mm°C in range of 25-200°C

Electric Resistivity

#### Electrical Resistivity

Electrical Resistivity = 0.123  $\mu\Omega$ -m at 25°C

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### Alloy SN100<sup>e</sup> Sn99.5/Cu0.5/Co

Alloy	J-STD-006C	Specs	Typical Analysis
Sn	99.5000 (±0.5)	99.3-99.7	99.6000
As	0.0300	0.0035 (max)	0.0015
Sb	0.200	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 (±0.1)	0.5000 (±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	0.070	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

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