



# Electrolytic Solder Product Bulletin

## Process Improves Purity

Metallic Resources' standard bar solder is manufactured from electrolytically processed tin and lead to create solder so pure it far exceeds most common specification requirements. It is available in standard 63/37 eutectic alloy, as well as non-standard specialty and custom formulated alloys, to meet each specification and production soldering need. Electrolytic solder is compatible with all fluxes, including "no-clean" fluxes. Standard packaging includes 25 and 50 pound boxes containing cast 2.2 pound kilo bars, or 8 pound ingots. Electrolytic solder is also available as nuggets.



## Versatile and Reliable

Metallic Resources electrolytic solder is especially designed for use in all wave, dip, and tinning soldering applications. High purity makes it especially beneficial to hot air leveling applications and high production rate operations that require consistent and reliable performance. It is primarily used in printed circuit board fabricating and assembly operations common to the electronics market. Nuggets are oftentimes used in wave soldering to start up the solder pot.

## Higher Yield, Less Waste

High purity electrolytic solder generates less dross compared to all other non-electrolytic and "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. Solder pots using electrolytic solder can be operated at lower temperatures to provide energy savings, extended pot life, reduced thermal stress, and reduced potential of contamination. Lower viscosity improves the fluidity, which in turn improves the solder's wetting capability.

The electrolytic manufacturing process assures batch-to-batch consistency for predictable solder performance in the solder pot. The process removes metallic and non-metallic impurities often found in "virgin metals" and reclaimed solders to provide a purer tin/lead solder. This purity results in a smaller crystalline structure which exhibits a shinier, more brilliant solder appearance.



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When nuggets are utilized to start up wave soldering machines, they are easily packed around the heating elements, eliminating hot spots. In smaller solder pots, nuggets become more economical to use since they provide the ability to make more precise pot additions when necessary.

### Exceeds Industry Standards

Standard electrolytic bar solder exceeds the rigid requirements of Specification J-STD-006. It meets Military Specification MIL-STD-2000, WS-6536E, is listed on the Qualified Products Listing as QPL-571-46, and is approved for military usage. Certificates of Conformance and Analysis are automatically provided with each shipment.

### Superior Quality

Metallic Resources unique electrolytic solders outshine all others to provide greater cost effectiveness, higher finished goods quality, and superior production line performance.



### Technical Specifications:

	Sn63 bar MRI Specification	MRI Typical Analysis	J-STD-006 Alloy Specification
<b>Sn</b>	62.50-63.50%	63.00%	62.50-63.50%
<b>As</b>	.0020 (max)	≤.0010	.0300 (max)
<b>Sb</b>	.0050 (max)	≤.0010	.5000 (max)
<b>Au</b>	.0010 (max)	≤.0003	.0500 (max)
<b>Fe</b>	.0010 (max)	≤.0005	.0200 (max)
<b>Ni</b>	.0010 (max)	≤.0005	.0100 (max)
<b>Bi</b>	.0020 (max)	≤.0010	.1000 (max)
<b>Al</b>	.0005 (max)	≤.0003	.0050 (max)
<b>Cu</b>	.0010 (max)	≤.0005	.0800 (max)
<b>Ag</b>	.0020 (max)	≤.0010	.1000 (max)
<b>Zn</b>	.0005 (max)	≤.0005	.0030 (max)
<b>Cd</b>	.0005 (max)	≤.0005	.0020 (max)
<b>In</b>	.0010 (max)	≤.0010	.1000 (max)
<b>S</b>	.0030 (max)	≤.0010	n/a
<b>P</b>	.0100 (max)	≤.0030	n/a
<b>Pb</b>	Balance	Balance	Balance

### Mechanical Properties:

**Tensile Strength** – 7,700 psi  
**0.1% offset Yield Strength** – 1,900 psi  
**0.2% offset Yield Strength** – 2,300 psi  
**Tensile Elongation** – 32%  
**Shear Strength** – 5,400 psi  
**Izod Impact Strength** – 14 foot-pounds  
**Stress to Produce a Creep Rate 0.0001 in/in/day** – 333 psi  
**Modulus of Elasticity** – 4,350,000 psi

### Physical Properties:

**Melting Point** – 361° F  
**Density** – 0.3032 lbs. per cubic inch  
**Brinell Hardness** – 15  
**Viscosity at 282° C (539° F)** – 0.0197 poise  
**Surface Tension at 282° F** – 490 dyne/cm  
**Coefficient of Linear Thermal Expansion** – 0.0000118 per degree F  
**Electrical Conductivity** – 69,000 Mho/cm  
**Electrical Conductivity** – 11.9% IACS (expressed as a % of the International Annealed Copper Standard, Copper is 100%)  
**Electrical Resistivity** – 0.0000145 Ohm-cm  
**Thermal Conductivity at 80° F** – 28.9 BTU/hr.-Ft.-per degree F

### Electrolytic 1003

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