

### Description

The 4901 *Sn99 No Clean Solder Wire* is an electronic grade solder wire. It uses a high-purity, eutectic Sn99.3/Cu0.7 alloy, which is complemented with a no clean, synthetically refined, splatter-proof resin flux core. The 4901 solder meets J-STD-004B, ASTM B 32, and exceeds J-STD-006C specifications.

This solder is a great lead-free alternative to leaded solders. It is suitable, less costly replacement for SAC305.

The 4901 solders achieve a consistent solder and flux percentage through a state-of-the-art, extrusion, wire-drawing machine. This machine continually monitors the wire to prevent voids and ensure consistency, providing a top-grade solder wire.

### Benefits & Features

- **Eutectic alloy** (liquidus = solidus temperature)
- **Alloy exceeds J-STD-006C and meets ASTM B 32 purity requirements**
- **Flux meets J-STD-004B**
- **The resin spreads like rosin-activated flux**
- **Virtually non-splattering**
- **Non-corrosive**
- **Non-conductive residue**
- **Halide free**
- **Suitable for Use in Food Facilities as a Non-Food Chemical**—Canadian and NFS recognition letters available on request

#### COMPLIANCE

- ✓ Dobb Frank ([DRC conflict free](#))
- ✓ REACH ([compliant](#))
- ✓ RoHS ([compliant](#))

### Wire Sizes Availability

<i>Cat No.</i>	<i>Std. Wire Gauge</i>	<i>Diameter</i>		<i>Packaging</i>	<i>Sizes</i>
4901	21	0.81 mm	0.032 in	Spool	¼, ½, 1 lb, or 2 lb

### General Flux Parameters

<i>Properties</i>	<i>Value</i>
Residue Removal	Not required
Flux Percentage	2.2%
Flux feature	Wets and spreads like a RA type flux and virtually non-splattering.
Shelf life	5 y

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### Flux Core Properties

The synthetically refined resin wets and spreads like a RA flux. This no clean flux is virtually non-spattering. It gives rise to a hard, non-conductive and non-corrosive residue.

<b>Physical Properties</b>	<b>Method</b>	<b>Value</b>
Flux Classification	J-STD-004B EN29454-1	RELO Type 1.1.3
Flux Type		Resin
Flux Activity		Low
Halides %(wt)		<0.05%
Solid Flux Color	Visual	Lightly opaque
Softening Point of Flux Extract		24 °C [75 °F]
Acid Number (mgKOH/g sample)	IPC-TM-650 2.3.13	190–210
Copper Mirror	IPC-TM-650 2.3.32	No removal
Silver Chromate—Chlorides + Bromides	IPC-TM-650 2.3.33	Pass
Solder Spread	IPC-TM-650 2.4.46	130 mm <sup>2</sup>
Flux Residue Dryness	IPC-TM-650 2.4.47	Pass
Spitting of Flux-Cored Wire Solder	IPC-TM-650 2.4.48	0.30%
Corrosion Test	IPC-TM-650 2.6.15	Non-corrosive
Surface Insulation Resistance (SIR)	IPC-TM-650 2.6.3.3	$2.3 \times 10^{11} \Omega$
Bellcore (Telecordia)	Bellcore GR-78-CORE 13.1.3	$6.1 \times 10^{11} \Omega$
Electromigration	Bellcore GR-78-CORE 13.1.4	Pass
Post Reflow Residue	TGA Analysis	55%
Cleaning Requirements	—	Optional

### Sn99.3/Cu0.7/Co Alloy Typical Literature Properties

<b>Physical Properties</b>	<b>Value</b> <sup>a)</sup>
Color	Silvery-white metal
Density @26 °C [78 °F]	7.4 g/cm <sup>3</sup>
Tensile Strength	22 N/mm <sup>2</sup> [3 100 lb/in <sup>2</sup> ]
Elongation	41%
Shear Strength	~23 N/mm <sup>2</sup> [~3 300 lb/in <sup>2</sup> ]
Hardness, Brinell	9HB
<b>Electrical Properties</b>	<b>Value</b>
Volume Resistivity	12.3 μΩ·cm
Electrical Conductivity <sup>b)</sup>	13% IACS

a) N/mm<sup>2</sup> = mPa; lb/in<sup>2</sup> = psi;

b) International Annealed Copper Standard: 100% give  $5.8 \times 10^7$  S/m.

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<b>Thermal Properties</b>	<b>Value</b>
Melting Point, Solidus	227 °C [442 °F]
Melting Point, Liquidus	227 °C [442 °F]
Tip Temperature Upper Limit	Do not exceed 400 °C [752 °F]
Coefficient of Thermal Expansion (CTE) <sup>c)</sup>	23.5 ppm/°C
Thermal Conductivity	~82 W/(m·K)
Specific Heat Capacity	~294 J/(kg·K)

**NOTE:** This table present typical literature values for Sn99.3/Cu0.7 alloys.

c) CTE for pure tin; unit conversions: ppm/°C =  $\mu\text{m}/(\text{m}\cdot\text{K}) = \text{in}/\text{in}/\text{°C} \times 10^{-6} = \text{unit}/\text{unit}/\text{°C} \times 10^{-6}$

### Solder Alloy Composition

<b>Properties</b>	<b>Value</b>	<b>Properties</b>	<b>J-STD-006C</b>
<b>MAIN INGREDIENTS</b>	<b>COMPOSITION</b>	<b>IMPURITIES</b> <sup>a)</sup>	<b>REQUIREMENTS</b>
Sn	99.3%	Sb	≤0.20% Max
Cu	0.7%	Ag	≤0.10% Max
		Bi	≤0.10% Max
		In	≤0.10% Max
		Pb	≤0.10% Max
		Au	≤0.05% Max
		As	≤0.03% Max
		Fe	≤0.02% Max
		Ni	≤0.01% Max
		Al	≤0.005% Max
		Zn	≤0.003% Max
		Cd	≤0.002% Max

a) Meets the requirements of J-STD-006C and meets ASTM B 32.

### Storage

Protect from direct heat or sunlight. Store between 18 to 27 °C [65 to 80 °F].

### Cleaning

The flux residue does not need to be removed for typical applications. If removal is desired, a solvent system like the *MG 4140* can be used. For best results, warm the cleaning solution to about 40 °C [104 °F].

### Health and Safety

Please see the 4901 **Safety Data Sheet** (SDS) for more details on transportation, storage, handling and other security guidelines.

**Health and Safety:** Avoid breathing fumes. Wash hands thoroughly after use. Do not ingest.

#### HMIS® RATING

<b>HEALTH:</b>	* <b>1</b>
<b>FLAMMABILITY:</b>	<b>0</b>
<b>PHYSICAL HAZARD:</b>	<b>0</b>
<b>PERSONAL PROTECTION:</b>	

#### NFPA® 704 CODES



*Approximate HMIS and NFPA Risk Ratings Legend:*

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

### Packaging and Supporting Products

<i>Cat. No.</i>	<i>Form</i>	<i>Packaging</i>	<i>Net Weight</i>	
<b>4901-112G</b>	Solid wire	Pack of 25	113 g	0.25 lb
<b>4901-227G</b>	Solid wire	Pack of 3	227 g	0.5 lb
<b>4901-454G</b>	Solid wire	Spool	454 g	1.0 lb
<b>4901-2LB</b>	Bar	Bar	908 g	2.0 lb



# Sn99 No Clean Solder Wire 4901 Technical Data Sheet

ISO 9001:2008 Registered Quality System. Burlington, Ontario, CANADA SAI Global File: 004008

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## Technical Support

Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at [www.mgchemicals.com](http://www.mgchemicals.com).

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## Warranty

*M.G. Chemicals Ltd.* warrants this product for 12 months from the date of purchase by the end user. *M.G. Chemicals Ltd.* makes no claims as to shelf life of this product for the warranty. The liability of *M.G. Chemicals Ltd.* whether based on its warranty, contracts, or otherwise shall in no case include incidental or consequential damage.

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