

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.

Physical Properties	Method	Value
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 ²
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

Physical Properties	Value ^{a)}
Color	Silvery-white metal
Density @26 °C [78 °F]	7.4 g/cm ³
Tensile Strength	22 N/mm ² [3 100 lb/in ²]
Elongation	41%
Shear Strength	~23 N/mm ² [~3 300 lb/in ²]
Hardness, Brinell	9HB
Electrical Properties	Value
Volume Resistivity	12.3 $\mu\Omega \cdot \text{cm}$
Electrical Conductivity ^{b)}	13% IACS

a) N/mm² = mPa; lb/in² = psi;

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

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Thermal Properties	Value
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) ^{c)}	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

Properties	Value	Properties	J-STD-006C
<i>MAIN INGREDIENTS</i>	<i>COMPOSITION</i>	<i>IMPURITIES</i> ^{a)}	<i>REQUIREMENTS</i>
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

HEALTH:	* 1
FLAMMABILITY:	0
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	

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>	
4901-112G	Solid wire	Pack of 25	113 g	0.25 lb
4901-227G	Solid wire	Pack of 3	227 g	0.5 lb
4901-454G	Solid wire	Spool	454 g	1.0 lb
4901-2LB	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.

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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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