Sn99 No Clean Solder Wire
4901 Technical Data Sheet

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

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

General Flux Parameters

Properties	*Value*
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-splattering. It gives rise to a hard, non-conductive and non-corrosive residue.

Physical Properties	*Method*	*Value*
Flux Classification	J-STD-004B EN29454-1	REL0 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	2.3×10^{11} Ω
Bellcore (Telecordia)	Bellcore GR-78-CORE 13.1.3	6.1×10^{11} Ω
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 μΩ·cm
Electrical Conductivity [b]	13% IACS

a) N/mm^2 = mPa; lb/in^2 = 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 = μm/(m·K) = in/in/°C × 10^{-6} = unit/unit/°C × 10^{-6}

Solder Alloy Composition

Properties	Value
MAIN INGREDIENTS	*COMPOSITION*
Sn	99.3%
Cu	0.7%

Pb RoHS COMPLIANT

Properties	J-STD-006C
IMPURITIES a)	*REQUIREMENTS*
Sb	≤0.20% Max
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

Cat. No.	*Form*	*Packaging*	*Net Weight*	
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

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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