

Description

The 4900–4917 SAC305 No Clean Solder Wire is an electronic grade solder wire. It uses the predominant lead-free alloy composition and exceeds J-STD-006C and meets ASTM B 32 purity specifications. It is complemented with a no clean, synthetically refined, splatter-proof resin flux core that is classified as RELO according to J-STD-004B. This solder is a great alternative to leaded solders.

The 4900–4917 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

- **Lead free & no clean**
- **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**
- **About 14% longer by weight than leaded solder wires**
- **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>
4912	25	0.51 mm	0.020 in	Spool	½ lb
4900	21	0.81 mm	0.032 in	Pocket Pack	0.6 oz
4900	21	0.81 mm	0.032 in	Spool	¼, ½, or 1 lb
4915	19	1.02 mm	0.040 in	Spool	¼ or 1 lb
4916	18	1.27 mm	0.050 in	Spool	¼ or 1 lb
4917	16	1.57 mm	0.062 in	Spool	½ 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

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.

<i>Physical Properties</i>	<i>Method</i>	<i>Value</i>
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 × 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

SAC305 Alloy Typical Literature Properties

<i>Physical Properties</i>	<i>Value</i> ^{a)}
Color	Silvery-white metal
Density @26 °C [78 °F]	7.49 g/cm ³
Tensile Strength	29.7 N/mm ² [4 310 lb/in ²]
Tensile Yield	25.7 N/mm ² [3 720 lb/in ²]
Elongation	27%
Shear Strength @20 °C and 0.1 mm/min	27 N/mm ² [3 900 lb/in ²]
@100 °C and 0.1 mm/min	17 N/mm ² [2 500 lb/in ²]
Creep Strength @20 °C and 0.1 mm/min	13 N/mm ² [1 900 lb/in ²]
@100 °C and 0.1 mm/min	5.0 N/mm ² [730 lb/in ²]
Hardness	15 HB
<i>Electrical Properties</i>	<i>Value</i>
Volume Resistivity	13 μΩ·cm
Electrical Conductivity ^{b)}	16.6% IACS

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Thermal Properties	Value
Melting Point, Solidus	217 °C [423 °F]
Melting Point, Liquidus	221 °C [430 °F]
Tip Temperature Upper Limit	Do not exceed 350 °C [662 °F]
Coefficient of Thermal Expansion (CTE) ^{c)}	23.5 ppm/°C
Thermal Conductivity	58.7 W/(m·K)


NOTE: This table present typical literature values for SAC305 alloys.

a) N/mm² = mPa; lb/in² = psi;

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

c) CTE 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	4900–4917
<i>MAIN INGREDIENTS</i>		<i>IMPURITIES</i> ^{a)}	<i>REQUIREMENTS</i>	<i>SPECIFICATIONS</i>
Sn	96.2 to 96.8%	Sb	≤0.20% Max	≤0.05% Max
Ag	2.8 to 3.2%	Bi	≤0.10% Max	≤0.05% Max
Cu	0.4 to 0.6%	In	≤0.10% Max	≤0.05% Max
		Pb	≤0.07% Max	≤0.05% Max
		Au	≤0.05% Max	≤0.002% Max
		As	≤0.03% Max	≤0.01% Max
		Fe	≤0.02% Max	≤0.01% Max
		Ni	≤0.01% Max	≤0.005% Max
		Al	≤0.005% Max	≤0.001% Max
		Zn	≤0.003% Max	≤0.001% Max
		Cd	≤0.002% Max	≤0.001% Max

a) Exceeds 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 4900-4917 **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>	
4900-35G	Solid wire	Pocket Pack ^{a)}	17 g	0.6 oz
4900-112G	Solid wire	Spool	113 g	0.25 lb
4900-227G	Solid wire	Spool	227 g	0.5 lb
4900-454G	Solid wire	Spool	454 g	1.0 lb
4912-227G	Solid wire	Spool	227 g	0.5 lb
4915-112G	Solid wire	Spool	113 g	0.25 lb
4915-454G	Solid wire	Spool	454 g	1.0 lb
4916-112G	Solid wire	Spool	113 g	0.25 lb
4916-454G	Solid wire	Spool	454 g	1.0 lb
4917-227G	Solid wire	Spool	227 g	0.5 lb

a) Box of 25 pocket packs



SAC305 No Clean Solder Wire 4900–4917 Technical Data Sheet

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

4900–4917

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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