

Description

The 4900–4917 SAC305 Lead Free Solder (No Clean) is an electronic grade solder wire. It uses the predominant lead-free alloy composition and exceeds J-STD-006 purity specifications. It is complemented with a no clean, synthetically refined, splatter-proof resin flux core that is classified as REL0 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**
- **Exceeds J-STD-006 impurity requirements**
- **The resin spreads like rosin activated flux**
- **Virtually non-splattering**
- **Non-corrosive**
- **Non-conductive**
- **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>Property</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	Indefinite

Continued on the next page

Page 1 of 5

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-004 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>Electric 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 × 10⁷ S/m.

c) CTE unit conversions: ppm/°C = μm/(m·K) = in/in/°C × 10⁻⁶ = unit/unit/°C × 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-006

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

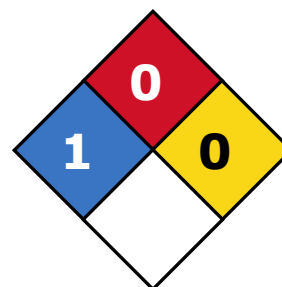
Please see the 4900 **Safety Data Sheet** (SDS) for more details on transportation, storage, handling and other security guidelines.

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

Product Availability

<i>Cat. No.</i>	<i>Form</i>	<i>Package</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



ISO 9001 Registered Quality System.
Burlington, Ontario, Canada QMI File # 004008

SAC305 Lead Free Solder (No Clean) 4900–4917 Technical Data Sheet

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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