

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

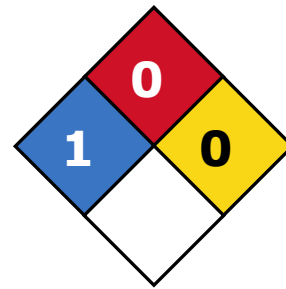
Please see the 4900-4917 **Safety Data Sheet** (SDS) for more details on transportation, storage, handling and other security guidelines.

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 |
| 4900-18GX2 | Solid wire | Pocket Pack ^{b)} | 21 g | 0.7 oz |
| 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

b) Case pack of 2



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.

Email: support@mgchemicals.com

Phone: +(1) 800-340-0772 (Canada, Mexico & USA)

+ (1) 905-331-1396 (International)

+ (44) 1663 362888 (UK & Europe)

Fax: +(1) 905-331-2862 or +(1) 800-340-0773

Mailing address: **Manufacturing & Support**
1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6

Head Office
9347–193rd Street
Surrey, British Columbia, Canada
V4N 4E7

Disclaimer

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