

Description

The 4860–4867 *Sn63Pb37 No Clean Solder Wire* is an electronic grade solder wire. It uses the eutectic tin-to-lead alloy ratio, which is complemented with a no clean, synthetically refined, splatter-proof, resin flux core. The solder wires meet J-STD-004B, ASTM B 32, and exceeds J-STD-006C specifications. It is one of the easiest solders to work with because it offers a low-melting temperature with a sharp melting/solidification point, which results in robust and reliable joints that are highly resistant to whisker formation.

The leaded 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**
- **Spreads like rosin-activated flux**
- **Virtually non-splattering**
- **Non-corrosive**
- **Non-conductive**
- **Halide free**

COMPLIANCE

- ✓ Dobb Frank ([DRC conflict free](#))
- ✓ REACH ([compliant](#))
- ✗ RoHS ([non-compliant](#))

Wire Sizes Availability

<i>Cat No.</i>	<i>Std. Wire Gauge</i>	<i>Diameter</i>		<i>Packaging</i>	<i>Sizes</i>
4860	21	0.81 mm	0.032 in	Pocket Pack	0.6 oz
4865	21	0.81 mm	0.032 in	Spool	½ or 1 lb
4866	19	1.01 mm	0.040 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

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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 Resin
Flux Type		Low
Flux Activity		<0.05%
Halides %(wt)		Lightly opaque
Solid Flux Color	Visual	24 °C [75 °F]
Softening Point of Flux Extract		190–210
Acid Number (mgKOH/g sample)	IPC-TM-650 2.3.13	No removal
Copper Mirror	IPC-TM-650 2.3.32	Pass
Silver Chromate—Chlorides + Bromides	IPC-TM-650 2.3.33	130 mm ²
Solder Spread	IPC-TM-650 2.4.46	Pass
Flux Residue Dryness	IPC-TM-650 2.4.47	0.30%
Spitting of Flux-Cored Wire Solder	IPC-TM-650 2.4.48	Non-corrosive
Corrosion Test	IPC-TM-650 2.6.15	2.3 × 10 ¹¹ Ω
Surface Insulation Resistance (SIR)	IPC-TM-650 2.6.3.3	6.1 × 10 ¹¹ Ω
Bellcore (Telecordia)	Bellcore GR-78-CORE 13.1.3	Pass
Electromigration	Bellcore GR-78-CORE 13.1.4	55%
Post Reflow Residue	TGA Analysis	Optional
Cleaning Requirements	—	

Sn63/Pb37 Alloy Typical Literature Properties

Physical Properties	Value ^{a)}
Color	Silvery-white metal
Density @26 °C [78 °F]	8.40 g/cm ³
Tensile Strength	54 N/mm ² [7 800 lb/in ²]
Elongation	37%
Hardness	14 HB
Shear Strength	37 N/mm ² [5 400 lb/in ²]
Electrical Properties	Value
Volume Resistivity	14.5 μΩ·cm
Electrical Conductivity ^{b)}	11.9% IACS

a) N/mm² = mPa; lb/in² = psi;

b) International Annealed Copper Standard: 100% give 5.8 × 10⁷ S/m.

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Thermal Properties	Value
Melting Point, Solidus	183 °C [361 °F]
Melting Point, Liquidus	183 °C [361 °F]
Tip Temperature Upper Limit	Do not exceed 260 °C [500 °F]
Coefficient of Thermal Expansion (CTE) ^{c)}	24.7 ppm/°C
Thermal Conductivity	50 W/(m·K)

NOTE: This table present typical literature values for 63/37 alloys.

c) Units conversions: ppm/°C = $\mu\text{m}/(\text{m}\cdot\text{K}) = \text{in}/\text{in}/^\circ\text{C} \times 10^{-6} = \text{unit}/\text{unit}/^\circ\text{C} \times 10^{-6}$

Solder Alloy Composition

Properties	Value	Properties	Value
MAIN INGREDIENTS		IMPURITIES ^{a)}	
Sn	63.5 to 63.5%	Sb	≤0.20% Max
Pb	36.5 to 37.5%	Ag	≤0.10% Max
		Bi	≤0.10% Max
		In	≤0.10% Max
		Cu	≤0.08% 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) Exceeds the requirements of J-STD-006C and meets ASTM B 32.

Storage

Protect from direct heat or sunlight.

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].

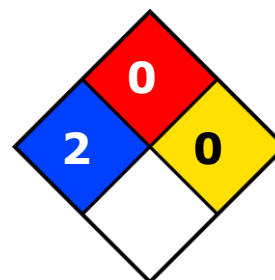
Health and Safety

Please see the 4860–4867 **Safety Data Sheet** (SDS) for more details on transportation, storage, handling and other security guidelines.

HMIS® RATING

HEALTH:	* 2
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)

Health and Safety: Avoid breathing fumes. Wash hands thoroughly after use. Do not ingest.

Packaging and Supporting Products

<i>Cat. No.</i>	<i>Form</i>	<i>Packaging</i>	<i>Net Weight</i>	
4860-18G	Solid wire	Pocket Pack ^{a)}	18 g	0.6 oz
4865-227G	Solid wire	Spool	227 g	0.5 lb
4865-454G	Solid wire	Spool	454 g	1.0 lb
4866-227G	Solid wire	Spool	227 g	0.5 lb

a) Box of 25 pocket packs



Sn63Pb37 No Clean Solder Wire 4860–4867 Technical Data Sheet

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

4860–4867

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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