

Description

The 4870–4877 of *Sn60Pb40 No Clean Solder Wire* is an electronic grade solder wire. It uses a classical 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 J-STD-006C specifications. It melts at a slightly higher temperature and over a wider range than the classical 63/37 solder. It 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

- 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 residue
- 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>
4870	21	0.81 mm	0.032 in	Pocket Pack	0.6 oz
4876	19	1.01 mm	0.040 in	Spool	½ lb
4875	21	0.81 mm	0.032 in	Spool	½ or 1 lb
4877	18	1.27 mm	0.050 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	5 y

Continued on the next page

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	$2.3 \times 10^{11} \Omega$
Bellcore (Telecordia)	Bellcore GR-78-CORE 13.1.3	$6.1 \times 10^{11} \Omega$
Electromigration	Bellcore GR-78-CORE 13.1.4	Pass
Post Reflow Residue	TGA Analysis	55%
Cleaning Requirements	—	Optional

Sn60/Pb40 Alloy Typical Literature Properties

<i>Physical Properties</i>	<i>Value</i> ^{a)}
Color	Silvery-white metal
Density @26 °C [78 °F]	8.50 g/cm ³
Tensile Strength	52 N/mm ² [7 500 lb/in ²]
Elongation	40%
Shear Strength	39 N/mm ² [5 700 lb/in ²]
Hardness	16 HB
<i>Electrical Properties</i>	<i>Value</i>
Volume Resistivity	15 μΩ·cm
Electrical Conductivity ^{b)}	11.3% IACS

a) N/mm² = mPa; lb/in² = psi;

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

Continued on the next page

Continued...

Thermal Properties	Value
Melting Point, Solidus	183 °C [361 °F]
Melting Point, Liquidus	191 °C [376 °F]
Tip Temperature Upper Limit	Do not exceed 260 °C [500 °F]
Coefficient of Thermal Expansion (CTE) ^{c)}	24 ppm/°C
Thermal Conductivity	50 W/(m·K)

NOTE: This table present typical literature values for 60/40 alloys.

c) CTE for pure tin; 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	Value
<i>MAIN INGREDIENTS</i>		<i>IMPURITIES</i> ^{a)}	
Sn	59.5 to 60.5%	Sb	≤0.20% Max
Pb	39.5 to 40.5%	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

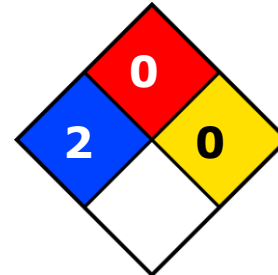
Please see the 4870–4877 **Safety Data Sheet** (SDS) for more details on transportation, storage, handling and other security guidelines.

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

HMIS® RATING

NFPA® 704 CODES

HEALTH:	* 2
FLAMMABILITY:	0
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	



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>	
4870-18G	Solid wire	Pocket Pack ^{a)}	18 g	0.6 oz
4875-227G	Solid wire	Spool	227 g	0.5 lb
4875-454G	Solid wire	Spool	454 g	1.0 lb
4877-227G	Solid wire	Spool	227 g	0.5 lb

a) Box of 25 pocket packs



Sn60Pb40 No Clean Solder Wire 4870–4877 Technical Data Sheet

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

4870–4877

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

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.

Disclaimer

This information is believed to be accurate. It is intended for professional end users having the skills to evaluate and use the data properly. *M.G. Chemicals Ltd.* does not guarantee the accuracy of the data and assumes no liability in connection with damages incurred while using it.