

# MATERIAL SAFETY DATA SHEET

**Classified as hazardous according to the criteria of NOHSC**

## **Identification**

**Product Names:** Multicore Tin/Lead Solder Wires Containing Rosin Based Fluxes.

Multicore rosin based flux cored tin/lead solder wire is identified by the alloy and flux codes shown below. The flux code can be found under the word 'Type' on the label.

**Alloy:** 5/95 TIN/LEAD, 10/90 TIN/LEAD, 15/85 TIN/LEAD, 20/80 TIN/LEAD, 30/70 TIN/LEAD, 35/65 TIN/LEAD, 40/60 TIN/LEAD, 45/55 TIN/LEAD, 50/50 TIN/LEAD, 59/41 TIN/LEAD, 60/40 TIN/LEAD, 63/37 TIN/LEAD, HMP, LMP, SAVBIT No 1, SAVBIT No 6, Sn50, Sn60, Sn62, Sn63.

**Flux Type:** 304, 311, 360, 362, 362P, 366, 370, 381, 399, 434, R2, R3, 362B2.

*Note the wire diameter and the pack size do not affect the safety properties of the wire.*

**Other Names:** Not relevant

**UN Number:** None allocated

**Dangerous Goods Class and Subsidiary Risk:** None

**Hazchem Code:** None allocated

**Poisons Schedule Number:** None allocated

**Use:**

Flux	Use
360, R2, R3	Pure rosin, non-activated flux, limited spread on parts of good solderability
381	Mildly activated, chloride and bromide free flux.
304	Halide-free activated flux, DIN preferred activated flux for electronics. Not as active as 370 or 362
370	Halide 0.4% max.. Non-corrosive activated flux to type RA specification. Most popular flux for TV and electronics in solders for USA Market.
434	Halide 0.4% max. Non-corrosive activated flux. Not quite as fast as 362 or 370 fluxes. This is a special non-spitting flux for critical electronic applications.
362	Halide 0.5% max.. Non-corrosive activated flux. The most popular flux for TV, electronics and consumer products used throughout the world.
362P	Halide 0.5% max.. Non-corrosive activated flux. Specially low flux content version of 362 where minimum flux residues are required.
311	Halide 0.84% max.. Non-corrosive activated flux.
366	Halide 1.0% max.. An extra active flux.
399	Non-corrosive rosin based flux which will solder difficult metals such as stainless steel, chromel alloy (chromium/nickel), almel alloy (aluminium/nickel), and constantan alloy (copper/nickel).

## **Physical Description/Properties**

**Appearance:** Silver white alloy wires.

**Boiling point:** Hazardous concentration of lead are given off at temperatures above 450°

**Vapour Pressure:** <1 mmHg at 25°C

Alloy	Composition (% <sup>w/w</sup> )				Melting Range		Specific Gravity
	Tin 7440-31- 5	Lead 7439-92- 1	Silver 7440-22- 4	Copper 7440-50- 8	Liquidus	Solidus	
5/95	5	95	-	-	315	300	10.8
10/90	10	90	-	-	299	275	10.5
15/85	15	85	-	-	290	225	10.2
20/80	20	80	-	-	275	183	10.0
30/70	30	70	-	-	255	183	9.7
35/65	35	65	-	-	245	183	9.5
40/60	40	60	-	-	234	183	9.3
45/55	45	55	-	-	224	183	9.1

Alloy	Composition (% <sup>w</sup> / <sub>w</sub> )				Melting Range		Specific Gravity
	Tin 7440-31-5	Lead 7439-92-1	Silver 7440-22-4	Copper 7440-50-8	Liquidus	Solidus	
Alloy	Composition (% <sup>w</sup> / <sub>w</sub> )				Melting Range		Specific Gravity
	Tin	Lead	Silver	Copper	Liquidus	Solidus	
50/50	50	50	-	-	212	183	8.9
59/41	59	41	-	-	190	183	8.5
60/40	60	-	-	-	188	183	8.5
63/37	63	37	-	-	183	183	8.4
HMP	5	93.5	1.5	-	301	296	11.1
LMP	62	36	2	-	179	179	8.5
Savbit No1	50	48.5	-	1.5	215	183	8.9
Savbit No6	60	38.2	-	1.8	190	183	8.5
Sn50	50	50	-	-	212	183	8.9
Sn60	60	40	-	-	188	183	8.5
Sn62	62	36	2	-	179	179	8.5
Sn63	63	37	-	-	183	183	8.4

**Flashpoint:** Not applicable

**Explosive Limits:** Not applicable

**Solubility in water:** Insoluble.

### **Other Properties**

**Reactivity:** Solder is not very reactive, it will react with concentrated nitric acid releasing poisonous fumes

### **Ingredients**

Lead is classified as hazardous by the criteria of NOHSC. For alloy composition see above. The figures quoted are nominal concentrations. Refer to the appropriate specification for the permitted levels of impurities. The wires may contain up to 3.5% of flux. The fluxes are based on modified rosin and this is the main component. Dependent upon the flux type fluxes may also contain aliphatic amine hydrochlorides or hydrobromides, or carboxylic acids, as activators.

## Health Hazard Information

### Health Effects

#### Acute

- Swallowed:** Lead can be absorbed into the body if swallowed. Lead can cause weakness, vomiting, loss of appetite, convulsions, stupor and possibly coma.
- Eye:** Flux fumes produced during soldering may irritate the eyes.
- Skin:** Flux fumes may irritate the skin. Lead is poorly absorbed through intact skin. Lead can be transferred by the skin.
- Inhalation:** The flux fumes produced during reflow will irritate the nose and throat. At normal reflow temperatures the amount of lead in the fume is low. Higher temperatures, such as may be found in a fire, may produce lead fume which if inhaled will cause symptoms similar to those described under swallowing.

#### Chronic

Prolonged exposure to the fumes may cause sensitisation by inhalation. Exposure will then cause symptoms of asthma (attacks of wheezing, chest tightness and breathlessness), or a runny or stuffy nose and watery or prickly eyes. Prolonged exposure to the flux fumes may also cause an allergic skin reaction leading to allergic contact dermatitis. Lead can cause weakness, insomnia, hypertension (high blood pressure), headache and possible paralysis. Chronic overexposure to lead may result in damage to the blood forming, nervous, urinary and reproductive systems. Lead is classified as a group 2B carcinogen (evidence is adequate in animals but inadequate in humans) by the IARC (1987).

#### First Aid

- Swallowing:** If the casualty is unconscious but breathing, place on one side in the recovery position. If breathing has stopped apply artificial resuscitation by the mouth to mouth or mouth to nose method. If the casualty is conscious then encourage them to wash their mouths out with water several times, but do not induce vomiting nor give anything to drink if the casualty finds it difficult to swallow. Obtain urgent medical attention.
- Eye:** Flush ***immediately*** with plenty of water, ensure that the eyeball and the inside of the eyelids are properly bathed by gently prising open the eyelids. Also make sure that the contaminated water runs off the face away from the eyes. Obtain urgent medical attention.
- Skin:** Wash the affected parts of the body with plenty of cold or lukewarm running water. Continue washing for at least 20 minutes. Remove contaminated clothing, wash before re-use. Obtain medical attention if blistering occurs or redness persists.
- Inhalation:** Rescuers should ensure they are properly protected before entering the area to remove the casualty. If the casualty is unconscious but breathing, place on one side in the recovery position. If breathing has stopped apply

artificial resuscitation by the mouth to mouth or mouth to nose method.  
Obtain medical attention.

**Advice to Doctors:** No information available.

## **Precautions For Use**

Providing a few precautions are taken the risks from lead in solder wires are low. The main possible route into the body is swallowing. For this reason eating, drinking and smoking should not be allowed in the area where soldering is carried out. The hands should be washed with soap and warm water after handling solder, particularly before before eating drinking or smoking.

### **Exposure Standards (Australian):**

Substance	TWA		STEL		Carcinogen Category	Notices
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>		
Lead	-	0.15	-	-	-	-
Rosin flux fume (as formaldehyde)	-	0.1	-	-	-	Sen

Sen: Material which is known to cause sensitisation

Information on monitoring strategies and methods can be found in the following publications:

NOHSC:1003, Exposure Standards for Atmospheric Contaminants in the Occupational Environment., National Occupational Health and Safety Commission, Australia.

Australian Standard, AS 2986, Workplace Atmospheres - Organic vapours - Sampling by Solid Adsorption Techniques., Standards Australia.

EH42, Monitoring Strategies for Toxic Substances, UK Health and Safety Executive.

EH28, Control of Lead: Air Sampling Techniques and Strategies, UK Health and Safety Executive.

MDHS 6, Methods for the Determination of Hazardous Substances, Lead: atomic absorption (AA)

MDHS 7, Methods for the Determination of Hazardous Substances, Lead: X-ray fluorescence (XRF)

MDHS 8, Methods for the Determination of Hazardous Substances, Lead: Colorimetric (dithizone)

Sawicki, E., Hauser, T R., Stanley, T W., and Elbert W: The 3-Methylbenzothiazoline Test., Anal. Chem., **33**, 1961, 93 - 96.

Hauser, T R., Cummin, R L., Increasing the Sensitivity to 3-Methyl-2-benzothiazoline Hydrazone Test for the Analysis of Aliphatic Aldehydes in Air Anal. Chem. 1964, **36**, 679 - 681.

## Engineering Controls

The engineering control methods must reduce hazardous exposure. Suitable methods include benchtop extraction, soldering iron tip extraction or an extraction arm.

## Personal Protection

- Respirator:** If engineering controls are not effective in controlling airborne exposure then respiratory protective equipment should be used suitable for protecting against fume. Reference should be made to Australian Standards *AS/NZS 1715, Selection, Use and maintenance of Respiratory Protective Devices*; and *AS/NZS 1716, Respiratory Protective Devices*.
- Eye protection:** While the fluxes have been formulated to reduce spitting, these products may spit. It is recommended that eye protection, safety glasses or goggles, to Australian Standard *AS/ANZ 1337, Eye Protectors for Industrial Applications*, should be worn.
- Clothing:** Suitable workwear should be worn to protect personal clothing, eg cotton overalls buttoned at neck and wrist. Reference should be made to Australian Standard, *AS 3765 Clothing for Protection Against Hazardous Chemicals*.

## Flammability

This product will not burn when exposed to fire.

## Safe Handling Information

- Storage:** These products should be stored in a cool, dry area out of reach of children and away from food, drink and animal foodstuffs.
- Transport:** These products are not classified as hazardous for transport.
- Spills:** Not Applicable

## Disposal

**Product Disposal:** Waste material should be disposed of in accordance with the relevant government regulations for special waste. The recommended method of disposal is as scrap solder metal.

**Container Disposal:** Empty reels may be disposed of by landfill.

## Fire Explosion Hazard

**Extinguishers:** Use foam, water fog, dry powder or carbon dioxide.

**Special fire fighting procedures:** Firefighters should wear full protective clothing and self contained breathing apparatus operated in positive pressure mode.

**Combustion products:** Under fire conditions the products will produce carbon dioxide, carbon monoxide, and irritant terpene. High temperatures may produce heavy metal dust, fumes and/or vapours.

### **Other Information**

#### **Ecotoxicity Data**

Lead is not degradable and will persist in the environment. Lead can build up in biological systems.

*The information presented in this safety data sheet is accurate to the best knowledge and belief of Prime Electronic Components Pty Ltd. As we cannot anticipate all conditions under which this information and our products or the products of other manufacturers in combination with our products this safety data sheet cannot constitute the users assessment of workplace risk. Users are advised to make their own tests to determine the safety and suitability of each product or product combination for their own purposes.*

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