

# Safety Data Sheet for Rosin flux cored solder

Published: 17 January 2005

REVISED: Nov 2007

## 1. Identification of the substance/ preparation and of the company/ undertaking

Product Name: Standard lead/ tin alloy solder wire, with rosin flux core.

Intended Use: This is a solder intended for hand soldering operations in electrical and electronic equipment.

Supplier: Acme Electronics Supplies  
Acme House  
Oxford Street  
London  
WC1 2AB  
Tel: 0123 456 7890  
Fax: 0123 456 7891

Emergency: Tel: +44 (0) 870 190 123X (National Chemical Unit)

## 2. Composition/ Information on Ingredients

| Chemical name | % (w/w) | CAS no.   | EC Number | Classification (See Section 16 for explanation)    |
|---------------|---------|-----------|-----------|--|
| tin           | 37-40   | 7440-31-5 | 231-141-8 |  |
| rosin         | 1-5     | 8050-09-7 | 232-475-7 | Xi R43   |
| lead          | 57-60   | 7439-92-1 | 231-100-4 | Repr; Cat 1 R61 - Repr Cat 3:R62 -R33 - Xn R20/22; |

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### 3. Hazards Identification

The product as supplied is classifiable as:

Repr Cat 1; R 61 – Repr Cat 3:R62 - R33 - Xn R20/22 - Xn R43

**Fumes produced by rosin when the product is heated in normal use may additionally cause respiratory sensitisation by inhalation.**

- Main Hazards:** Thermal burns from contact with molten product. Exposure to rosin based solder flux fume can cause occupational asthma, or exacerbate pre-existing asthmatic conditions.
- Inhalation:** The fumes produced by heating rosin when the product is in normal use may cause sensitisation by inhalation. Solder alloys containing lead give off negligible lead fume at normal soldering temperatures, and at temperatures up to 500°C.
- Ingestion:** Contains lead, which is a cumulative poison. Long-term effects include anaemia, fatigue, abdominal pain, anorexia, constipation or diarrhoea, reduced oxygen carrying capacity of blood. It can also cause birth defects and other reproductive harm.
- Skin & Eyes:** Molten metal may cause severe damage to skin and eyes.
- Environmental:** Tin and lead in the product may leach from landfill as salts and these are potentially hazardous to aquatic organisms.

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#### 4. First Aid Measures

- Inhalation of fume: Inhalation of solder flux fume (at normal use temperatures) may cause respiratory distress, and inhalation of lead fume (produced at temperatures above 500°C) can give rise to lead poisoning. Remove to fresh air. If patient has respiratory difficulty, seek medical attention.
- Skin contact: Rosin based solder flux fume may cause a skin rash to develop. If any skin rash develops, seek medical advice.
- Eye contact: Rosin based solder flux fumes may irritate eyes. Flush immediately with plenty of water. The flux may spit during soldering. In cases where spitting flux has entered the eye seek medical attention.
- Ingestion: Do not induce vomiting. Obtain medical advice.

#### 5. Fire Fighting Measures

- Suitable extinguishing media: The substance is not flammable. Any media suitable for the fire engulfing the solder may be used.
- Exposure hazards: The fumes produced by rosin may cause sensitisation by inhalation. Temperatures above 500°C may produce fumes and/or vapours that, on cooling, may condense as heavy metal dust.
- Protective measures: Fire fighters should wear full protective clothing and breathing apparatus operated in positive pressure mode.

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## 6. Accidental Release Measures

|                            |   |
|----------------------------|---|
| Personal precautions:      | Avoid inhalation of any fume from hot product. Avoid contact with hot product, and wash hands after handling cold product. Refer to Section 8, Personal Protection.               |
| Environmental precautions: | Ensure solder is collected in suitable containers for disposal in accordance with local and national legislation. Refer to Section 13, Disposal.                                  |
| Methods for Cleaning Up:   | No special methods required. Solder wire and solder wire pieces can be picked or swept up and placed into any suitable container. Observe personal hygiene measures in Section 8. |

## 7. Handling and Storage

|           |  |
|-----------|--|
| Handling: | The fumes produced during use should be extracted away from the breathing zone of the operators using properly designed efficient, well-maintained, local exhaust ventilation. See HSE publications HSG 37 and especially INDG 249. Ensure that the general area is well ventilated. Do not eat, drink or smoke during use. Wash hands with soap and water after handling soldering products, particularly before eating, drinking or smoking. |
| Storage:  | Keep out of the reach of children and away from food and drink.  |

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## 8. Exposure Controls / Personal Protection

Relevant occupational exposure limits:

| Substance:                    | Long term exposure limit (8 hr TWA) | Short term exposure limit (15 minute) |
|-------------------------------|-------------------------------------|---------------------------------------|
| Rosin based solder flux fume* | 0.05 mg.m <sup>-3</sup>             | 0.15 mg.m <sup>-3</sup>               |
| Lead                          | 0.15 mg.m <sup>-3</sup>             | -                                     |

\*Rosin based solder flux fume has been assigned a Workplace Exposure Limit (WEL), measured as total resin acids, in HSE Publication EH 40. The COSHH Asthmagens ACOP requires that exposure must be reduced as far as reasonably practicable below the WEL. Monitoring for rosin based solder flux fume should be in accordance with the guidance in MDHS 83/2.

### Personal Protection:

**Respiratory protection:** Fume should be primarily controlled by engineering measures (see under handling). If there is inadequate fume extraction during use than a combined particulate and organic vapour filter or cartridge to FFFP3 to EN 149:20001 should be the minimum requirement, however this may not provide adequate protection from facial skin sensitisation caused by exposure to fume.

**Eye protection:** Operators should wear 'CE' marked glasses or goggles conforming to EN 166, to protect the eyes if there is a risk from spitting flux.

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|                      |   |
|----------------------|---|
| Hand protection:     | May be required if there is a likelihood of thermal burns. For protection against molten solder or hot objects a glove manufactured from Kevlar® or similar material will be required. This should be worn over a single-use nitrile glove to also provide protection against skin exposure to the rosin. Appropriate precautions should be taken to ensure that long-term use of gloves does not lead to skin condition that could result in irritant contact dermatitis. We recommend that appropriate specialist advice be obtained either from an independent adviser or from a reputable glove manufacturer. |
| Health surveillance: | Exposure to rosin, even as fume, can cause dermatitis, and health surveillance is recommended. Health surveillance is also advisable to monitor for the onset of any respiratory problems unless the risk assessment of the fume control strategy is such that there is not a reasonable likelihood that occupational asthma may occur.   |
| Environmental:       | Do not allow solder wire to enter the general waste stream.   |

|  |
|--|
| 9. <i>Physical and Chemical Properties</i> |
|--|

|                          |                                 |
|--------------------------|---------------------------------|
| Appearance/ colour:      | Grey wire.                      |
| Melting range:           | 183-188°C.                      |
| Solubility/ miscibility: | Insoluble in water and acetone. |

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## 10. Stability and Reactivity

Conditions to avoid: If solder is exposed to temperatures over 500°C lead fume will be produced.

## 11. Toxicological Information

- Inhalation: The product does not present a risk at ambient temperatures. Inhalation is the main route of exposure for flux fumes. Rosin based solder flux fume is a respiratory sensitiser which can cause or exacerbate occupational asthma. Providing that soldering temperature is below 500°C the amount of lead in the fume should be negligible.
- Eye contact: The flux fumes may irritate the eyes.
- Skin contact: Rosin is a skin sensitiser, and may cause dermatitis. In use, solder fumes in contact with the skin may trigger a skin reaction. Cold lead is not regarded as a skin hazard, but lead can be transferred from the skin onto food, cigarettes, etc. if a high standard of personal hygiene is not exercised – see Ingestion below.
- Ingestion: Whilst in the form supplied, lead ingestion is not considered likely, heating lead above 500°C will give rise to lead fume which can condense as fine particles or dust in the workplace, and can contaminate skin, food, cigarettes, etc. Lead is a reprotoxic material that can cause harm to the unborn child and may also impair fertility. Lead can cause blood formation impairment and central nervous system depression.

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## 12. *Ecological Information*

Lead and tin are not biodegradable and will persist in the environment. Lead is insoluble in water and is not attacked by most inorganic acids. Lead is bioaccumulated by terrestrial and aquatic plants and animals, but is not biomagnified in terrestrial or aquatic food chains. However tin and lead in the product may leach from landfill as salts and these salts are potentially hazardous to aquatic organisms. (See section 13.)

## 13. *Disposal Considerations*

Waste solder wire is classified as HAZARDOUS WASTE under the Hazardous Waste (England and Wales) Regulations 2005 (SI No 894) (HWR) and The List of Wastes (England) Regulations 2005 (SI 895) (LoWR) and equivalents in Wales, Scotland and Northern Ireland and should be put in suitable containers and consigned to an appropriately licensed disposal or recovery facility.

List of Waste/European Waste Catalogue ('EWC') codes 06 04 05\* or 10 04 02\* or 10 08 11\* may be appropriate.

## 14. *Transport Information*

Solder wire is not classified as dangerous goods for transportation.

## 15. *Regulatory Information*

The use of this product is subject to the requirements of the Control of Substances Hazardous to Health Regulations 2002 (COSHH) (SI 2002 No 2677, as amended). See also HSE COSHH Essentials (<http://www.coshh-essentials.org.uk/>)

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The use of this product is subject to the EC Restrictions of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC), as implemented by the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2006 (SI 2006 No 1463).

## 16. Other Information

### Symbol Letters and Phrases used in Section 2.

NB These may not apply to the preparation as supplied.

Symbol Letters

Xn = Harmful

Short terms

Repr = Substance Toxic for Reproduction

Cat = Category [1 = worst]

Risk Phrases:

R20/22 - Harmful by inhalation and if swallowed.

R33 - Danger of cumulative effects.

R43 - May cause sensitisation by skin contact.

R61 - May cause harm to unborn child.

R62 - Possible risk of impaired fertility.

### Training Advice

Employees using this product will require to be provided under the Health and Safety at Work Etc Act 1974 Section 2 and the COSHH Regulations with suitable and sufficient information, instruction and training. This should particularly address the issue of the risk of respiratory sensitisation to solder fume and the potential for developing of occupational asthma.

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**Recommended uses and restrictions:** Use only as directed. The *Water Supply (Water Fittings) Regulations 1999* forbid the use of lead containing solder in any private or public drinking water supply system.

### **Further Information**

#### HSE Publications

INDG 248(rev) 'Solder fume and you' and INDG 249 'Controlling health risks from rosin (colophony) based solder fluxes'.

Health Surveillance guidance is available in 'Preventing Asthma at work: how to control respiratory sensitisers', L55, and MS24 'Medical aspects of occupational skin disease'.

MDHS 83/2 'Resin acids in rosin (colophony) solder flux fume- Laboratory method using gas chromatography'.

#### **Sources of Key Data**

CHIP Approved Supply List (ASL), 8<sup>th</sup> Edition

IUCLID

HSE Publications mentioned above

Safety Data Sheets from constituent suppliers

IPCS International Chemical Safety Card ICSC:0052, 8 Oct 2002

#### **Revisions**

*Revision date: 11 June 2007 minor amendments standardising references to rosin based solder flux fume.*

*Revision date: 23 April 2007 (Replacing 05 February 2007) Removal of advice on labelling in Section 15, and minor amendments including changes to supplier details and advisory footnote.*

*Revision date: 05 February 2007 (Replacing 12 December 2006) Minor amendments including clarification of intended use, removal of reference to symbol 'T' and additional information on hand protection.*

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*Revision date: 12 December 2006 (Replacing 2 November 2006).  
Amendment to Section 13 on disposal of waste.*

*Previous changes (2 November 2006): Correct display of classification of lead and of product. Add EN reference for eye protection. Correct header of Section 8. Correct data in last sub-section of Section 6. (23 Oct 2006): Correction to classification of product and rosin in Section 2 and presentation of classification information. Add specific references and generally update throughout.*

EXAMPLE

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