Durham University

Responsible Safety

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COSHH Assessment Form [03]

Name of Substance:	**PbSn Solder (Lead-Tin Solder)**	**Reference:**	CAS No. Pb: 7439-92-1 Sn: 7440-31-5	
1. Eliminating the hazardous substances: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?			~~Yes~~	**No**
2. Substitution: Is it possible to use a less harmful substance to do the work?			~~Yes~~	**No**

Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance. MSDS's are available from suppliers and manufacturers of products.

3. Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used .	**SOLDERING (Making electrical connections)** Description of use: PbSn solder is used because of its low melting point and good electrical and mechanical properties when cold. It is melted at 179 to 183 °C using a soldering iron while in direct contact with the item being soldered. Exposure duration: The soldering process will be intermittently done over a period of around one hour with localised fume extraction in a ventilated laboratory. Substance amount: Only a small amount of solder will be required to fix the sample to the brass platform and to attach the voltage leads to the sample. **INITIAL WARNINGS**: Always ensure good ventilation/extraction is employed while soldering. Protect bare skin from accidental contact with hot solder. Wear protective gloves when handling. Wash hands with soap and water after use.	**How long?** As long as needed	**How often?** As often as needed	**How much?** As much as needed

Location of work:	Laboratory							
Persons at risk:	Employees	✓	Students	✓	Others	✓	Vulnerable persons	✘

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Classification – Place an X in the box next to the appropriate sign. For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm					
 Irritant		 Flammable		 Oxidising	
 Toxic		 Compressed Gas		 Serious long term health hazard	X
 Corrosive		 Explosive		 Dangerous to the Environment	

	
Skin Contact:	Rinse with running water and soap. Obtain medical attention if irritation persists.
Eye Contact:	Flush eyes with plenty of water for at least 5 minutes. If irritation persists seek medical attention.
Ingestion:	Do not induce vomiting. Seek medical advice.
Inhalation:	Move to fresh air. If symptoms persist, seek medical advice.

Indicate below which form the substance takes:															
Gas		Vapour		Mist		Fume	✓	Dust	✓	Liquid		Solid	✓	Other	

Indicate below which route(s) of exposure the substance takes:									
Inhalation	✓	Skin	✓	Eyes	✓	Ingestion	✓	Other	

Specific Hazards

Causes damage to organs (Blood, Kidney, Central Nervous system) through prolonged or repeated exposure (inhalation-dust, oral). May damage fertility. May damage the unborn child. May cause harm to breast-fed children. Fumes evolved at soldering temperatures will irritate the nose, throat and lungs. Prolonged or repeated exposure to flux fumes may result in sensitisation in sensitive workers. Fumes emitted during soldering may irritate the eyes and skin.

Workplace Exposure Limits (WELs)

Long-term exposure level (8hrTWA):	Short-term exposure level (15mins):
Lead: 0.15 mg/m^3 Tin: 2 mg/m^3	Lead: 0.45 mg/m^3 Tin: 6 mg/m^3

List the risks to health below from exposure to the substance click here information on hazard statements http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm

H360FD May damage fertility. May damage the unborn child.
H362 May cause harm to breast-fed children.
H372 Causes damage to organs (Blood, Kidney, Central Nervous system) through prolonged or repeated exposure (inhalation-dust, oral)

Control Measures: List below control measures e.g. extraction, ventilation, supervision, include additonal controls for vulnerable persons where necessary

1. Good ventilation and/or extraction
2. Health surveillance or monitoring is required for any person who potentially could receive exposure above the STEL: 0.45 mg/m^3 15 min for Lead or the STEL: 6 mg/m^3 15 min for Tin. Specific assessments to identify the requirement for health surveillance or monitoring should be undertaken for vulnerable persons for any level of exposure.
3. Good industrial hygiene practices should be observed.

Certain substances may react adversly if they come into contact with others, please list any compatibility warnings here:

Solder alloy will react with concentrated nitric acid to produce toxic fumes of nitrogen oxides.

4. Do not eat, drink or smoke while working. After handling solder wash hands with soap and water before eating, drinking or smoking.	

Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons e.g. pregnant/young workers those with asthma, dermatitis etc)	**Yes** (see point 2 in Control Measures section.)	~~No~~

Personal Protective Equipment (identify type and specification)

 Dust mask	N/A	 Visor	N/A
 Respirator	An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area – recommended to wear respirator fitted with ABEK P2 filter (EN 14387)	 Goggles	Safety glasses with sideshields or chemical safety goggles should be worn if there is a risk of splashing. Protective eye equipment should conform to EN166.
 Gloves	**BT = Breakthrough Time** **Nitrile rubber**: thickness 0.4 mm – BT >480 min	 Overalls	Wear suitable protective clothing. Protective clothing should conform to EN 14605 for liquid splashes or to EN 13982 for dusts.
 Footwear	N/A	 Other	EXTRACTION

Fire (identify appropriate fire extinguishers)

Dry Powder	✓	CO2	✓	Water	✓	Foam	✓	Fire Blanket	

During combustion substances may give rise to harmful vapours/gases etc please detail below:

High temperatures may produce heavy metal dust, fumes or vapours. The flux medium will give rise to irritating fumes.

Storage:

Ensure good ventilation/extraction. Store in a cool, dry place.

Disposal of waste substances & containers please indicate below (for advice contact 46042)

Hazardous Waste		General Waste		Biological Waste		Return to Supplier		Other	✓

If other please state: Wherever possible unwanted solder alloy should be recycled for recovery of metal. Otherwise dispose of in accordance with local and national regulations.

Risk Evaluation (using risk matrix)

Uncontrolled risk level:	**CAUTION**	**Controlled risk level:**	**CARE**
Person(s) involved in COSHH assessment:	Dr. Mark J. Raine		

Date:	04/12/2024	**Signature:**	M.Raine	**Review date:**	04/12/2027

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RISK LEVEL

		Likelihood of Occurrence			
		Very Unlikely Little or no chance of occurrence	**Unlikely** A rare combination of factors would be required for an incident to result.	**Possible** Not certain to happen but an additional factor may result in an accident	**Probable** More likely to occur than not
Hazard Severity	**Minor** No or minor injury (first aid)	**CARE**	**CARE**	**CARE**	**CAUTION**
	Moderate Off-site medical treatment or DAFW*	**CARE**	**CARE**	**CAUTION**	**ALERT**
	Serious More than one DAFW, long-term absence	**CARE**	**CAUTION**	**ALERT**	**STOP!**
	Major Permanent disability or harm, fatality	**CAUTION**	**ALERT**	**STOP!**	**STOP!**

***DAFW – Day Away From Work**

CARE	Minor harm possible, serious harm very unlikely to occur; implement controls and ensure care is taken when performing activity.
CAUTION	Minor harm probable, major harm unlikely to occur; follow all control measures, increased level of competence required and ongoing self-assessment of risks identified.
ALERT	Moderate degree of harm probable but major harm unlikely; critically assess the risks and appropriate controls. Specific competence required and ongoing assessment of risks by individual and/or supervisor.
STOP!	Serious or major harm will probably occur; stop the activity and critically assess the risks, review safety aspects of activity and implement further, appropriate controls. Consider referencing HSE or other Best Practice, consider involving HSS.