

# MATERIAL SAFETY DATA SHEET

## SECTION I MATERIAL IDENTIFICATION

MATERIAL NAME: Solder  
 MANUFACTURER'S NAME: Nuclead Inc.  
 415 North Elm. Street  
 West Bridgewater, MA 02379  
 508-583-2699  
 Date: January, 2004

## SECTION II HAZARDOUS INGREDIENTS

<u>ELEMENT</u>	<u>CAS NUMBER</u>	<u>%</u>	<u>OSHA 8-HR TWA</u>	<u>ACGIH 8-HR TWA (1984-85)</u>	<u>ACGIH STEL (1984-85)</u>
Tin	(7440-31-5)	var.	2mg/m <sup>3</sup>	2mg/m <sup>3</sup>	4mg/m <sup>3</sup>
Lead	(7439-92-1)	var.	0.05mg/m <sup>3</sup>	0.15mg/m <sup>3</sup>	0.45mg/m <sup>3</sup>
Antimony	(7440-36-0)	<5	0.5mg/m <sup>3</sup>	0.5mg/m <sup>3</sup>	-----
Copper	(7440-50-8)	<1 dust fume	1mg/m <sup>3</sup> 0.1mg/m <sup>3</sup>	1mg/m <sup>3</sup> 0.2mg/m <sup>3</sup>	2mg/m <sup>3</sup> -----
Silver	(7440-22-4)	<5	0.01mg/m <sup>3</sup>	0.1mg/m <sup>3</sup>	-----
Arsenic	(7440-38-2)	<.02	0.01mg/m <sup>3</sup>	0.2mg/m <sup>3</sup>	-----
Cadmium	(7440-43-9)	<.001 dust fume	0.2mg/m <sup>3</sup> 0.1mg/m <sup>3</sup>	0.05mg/m <sup>3</sup> 0.05mg/m <sup>3</sup> (ceiling limit)	0.2mg/m <sup>3</sup> -----

\*NOTE: Antimony trioxide, arsenic and cadmium have been identified as potential human carcinogens. See SEC VI, Health Hazard Data.

## SECTION III PHYSICAL DATA

	<u>MELTING POINT</u>	<u>SPECIFIC GRAVITY</u>	<u>BOILING POINT</u>	<u>VAPOR PRESSURE</u>	<u>SOLUBILITY IN WATER</u>	<u>APPEARANCE</u>
LEAD	327°C	9.73-11.36	1,740°C	1mm Hg @ 973°C	Insoluble	Silver-gray metal odorless, various shapes and sizes.
TIN	232°C	7.28-8.42	2,507°C	1mm Hg @ 1,492°C	Insoluble	Silver-gray metal odorless, various shapes and sizes.

## **SECTION IV FIRE AND EXPLOSION DATA**

FLASH POINT, N/A

FLAMMABILITY LIMITS, N/A

AUTOIGNITION TEMPERATURE, N/A

Solid massive form of material is not combustible under ordinary fire conditions. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat or flames. Hazards exist also with chemical reactions, or contact with powerful oxidizers.

FIRE EXTINGUISHING METHODS: Use special mixtures of dry chemical. do not use water or moist sand. Fire fighters should wear self-contained breathing apparatus and protective clothing.

## **SECTION V REACTIVITY DATA**

Massive material is stable at ordinary temperatures, but dust presents moderate fire and explosion hazards. Material may be incompatible with acids, bases, and oxidizers. Molten metal may react violently with water. for additional information, users should consult data sheets on individual component elements.

## **SECTION VI HEALTH HAZARD DATA**

TLV: See section II

PRIMARY ROUTES OF ENTRY: Inhalation of dust or fume.

Under normal handling and use, exposure to the massive form of solder presents few health hazards in itself. Thermal cutting and melting of material may produce fumes containing the component elements, and breathing these fumes may present potentially significant health hazards. The exposure levels in section II are relevant to fumes and dusts. Special precautions should be taken if material contaminated: See section IX.

Carcinogenicity: NTP? NO IARC Monographs? NO OSHA Regulated? NO

Overexposure to solder dusts may cause irritation of the skin and mucous membranes, and may result in a benign pneumoconiosis. Overexposure to antimony may cause gastrointestinal upset and various nervous complaints such as sleeplessness, irritability and muscular pains.

Prolonged inhalation of lead fumes or dusts, or ingestion of lead compounds, can result in lead poisoning. Symptoms include abdominal pain or colic, constipation, nausea, joint and muscle pains, and muscular weakness. Severe cases of overexposure may lead to central nervous system disorders, characterized by somnolence, stupor, and ultimately death.

Overexposure to arsenic fumes or dusts can lead to arsenic poisoning, characterized by nausea, vomiting and diarrhea. Prolonged overexposure can lead to liver and kidney damage, central nervous system disorders, and ultimately death. Arsenic can cause skin irritation and allergic reactions.

Overexposure to cadmium fumes or dusts may cause pains, shortness of breath, lung changes, and pulmonary edema, ultimately leading to death. Cadmium may also cause damage to liver and kidneys.

Fumes of copper may cause metal fume fever with flu like symptoms. Copper may cause skin and hair discoloration. Silver may cause a grayish pigmentation of the skin and cause irritation of the skin and mucous membranes.

FIRST AID

EYE CONTACT: Flush well with running water to remove particulate. Get medical attention.  
SKIN CONTACT: Brush off excess dust. Wash area well with soap and water.  
INHALATION: Remove to fresh air get medical attention.  
INGESTION: Seek medical help if large quantities of material have been ingested. (Ingestion of significant amounts of metal is unlikely.)

### **SECTION VII SPILL PROCEDURES**

No special precaution are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentration of airborne dust. Clean-up personnel should wear respirators and protective clothing. Scrap metal can be reclaimed for reuse. Follow federal, state, and local regulations regarding disposal.

### **SECTION VIII SPECIAL PROTECTION INFORMATION**

Use general and local exhaust ventilation to keep airborne concentrations of dust and fume below the TLV. Employees should wear MSHA or NIOSH approved respirators for protection against airborne dust and showering should be required before changing into street clothes. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis. Approved safety glasses or goggles should be worn when working with dusty material. Safety eyewash stations should be provided in close proximity to work area.

Pre-employment and periodic medical evaluations should be provided. Attention should be directed toward skin, eyes, respiratory tract, blood, kidneys, pulmonary functions and neurologic health. Chest x-rays should be included if symptoms are present.

Food should not be consumed in the work area.

Special attention is drawn to the requirements of the Occupational Safety and Health Administration standards for lead (29 cfr 1910.1025) and arsenic (29 cfr 1910.1018). State OSHA programs will have similar requirements.

Special precautions should be taken if scrap solder or scrap lead is contaminated. See section IX.

### **SECTION IX SPECIAL PRECAUTIONS.**

Use good housekeeping practices to prevent accumulations of dust and to keep airborne dust concentrations at a minimum. Avoid breathing dust or fumes.

Store material away from incompatible materials, and keep dust away from sources of ignition.