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Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

WOOD'S ALLOY, STICKS

1. Product Identification

Synonyms: Wood's Metal; Fusible alloy; Bismuth, Lead, Tin, and Cadmium alloy

CAS No.: 8049-22-7

Molecular Weight: Not applicable.

Chemical Formula: Not applicable.

Product Codes: 2684

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Bismuth Metal	7440-69-9	50%	Yes
Tin	7440-31-5	13.3%	Yes
Lead	7439-92-1	26.7%	Yes
Cadmium	7440-43-9	10%	Yes

3. Hazards Identification

Emergency Overview

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD, PROSTATE, AND REPRODUCTIVE SYSTEM. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure. DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)

Flammability Rating: 0 - None

Reactivity Rating: 0 - None

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

The physical size of the alloy sticks makes inhalation or ingestion rather unlikely. The principal inhalation hazard would be the fumes or fine particles from the alloy when heated much above its melting point. These would be of indefinite composition, but it may be assumed that the highly toxic elements lead and cadmium would be present.

Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.

Cadmium absorption is most efficient via respiratory tract. Inhalation of dust may produce irritation, headache, metallic taste and/or cough. Severe exposures may produce shortness of breath, chest pain, and flu-like symptoms with weakness, fever, headache, chills, sweating, nausea and muscular pain. Can cause pulmonary edema, liver and kidney damage and death. Symptoms from inhalation may be delayed for as much as 24 hours.

Ingestion:

Difficult, due to the size of the sticks. Small pieces or particles of Wood's Metal, if ingested, should be assumed to be toxic, though the degree is uncertain. It is recommended that the precautions appropriate to lead metal ingestion be taken.

The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Ingestion of cadmium can cause a flu-like illness with chills, headache, aching and/or fever. High exposure may cause nausea, vomiting, cramps and diarrhea. Bismuth is poorly absorbed. Should absorption occur, symptoms may include loss of appetite, headache, skin rashes, kidney damage, and rarely mild jaundice. Large doses of tin may cause nausea, vomiting, and diarrhea.

Skin Contact:

May cause mild irritation. Lead and lead compounds may be absorbed through the skin on

prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.

Eye Contact:

Fine particles may cause abrasive irritation with pain or inflammation.

Chronic Exposure:

Prolonged contact with Wood's Metal or its fumes may lead to some degree of heavy metal poisoning, especially the accumulation of lead in the body. Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. Muscle weakness and central nervous system irregularities may be noted. Chronic exposure to cadmium, even at relatively low concentrations, may result in kidney damage and an increased risk of cancer of the lung and of the prostate. Decrease in bone density, renal stones, and other evidence of disturbed calcium metabolism may be observed. Prolonged inhalation of tin dust or fumes may result in a benign pneumoconiosis, producing distinctive changes in the lungs with no apparent disability or complications. Repeated or prolonged ingestion of bismuth may cause black spots on the gums, foul breath, and salivation. Chronic exposure may affect kidneys and liver.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard. Powder/dust is flammable when heated or exposed to flame.

Explosion:

Not considered to be an explosion hazard. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not use water on fire where molten metal is present.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Avoid dust formation and control ignition sources. Employ grounding, venting and explosion relief provisions in accord with accepted engineering practices in any process capable of generating dust and/or static electricity. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

- OSHA Permissible Exposure Limit (PEL) -

For metallic lead and all inorganic lead compounds:

0.05 mg/m³ (TWA); 0.03 mg/m³ (Action Level).

For cadmium, elemental and compounds, as Cd:

0.005 mg/m³ (TWA); 0.0025 mg/m³ (Action Level); OSHA Cancer Hazard.

For tin:

2 mg/m³ (TWA).

- ACGIH Threshold Limit Value (TLV) -

For lead, elemental and inorganic, as Pb:

0.05 mg/m³ (TWA), A3 - Animal carcinogen.

For cadmium, elemental and compounds (inhalable particulate):

0.01 mg/m³ (TWA), A2 - Suspected human carcinogen.

For cadmium, elemental and compounds (respirable fraction):

0.002 mg/m³ (TWA), A2 - Suspected human carcinogen.

For tin, metal:

2 mg/m³ (TWA).

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing cadmium or lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1025 and 29 CFR 1910.1027).

9. Physical and Chemical Properties

Appearance:

Silver-gray sticks.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

9.7

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

Not applicable.

Melting Point:

69 - 72C (156 - 162F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

Not applicable.

Evaporation Rate (BuAc=1):

Not applicable.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Toxic metal fumes may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

For Bismuth: aluminum, bromine trifluoride, strong oxidizers, strong acids, nitrosyl fluoride, ammonium nitrate, chloric acid, chlorine, iodine pentafluoride, nitric acid, perchloric acid, and bismuth hydroxide plus aluminum hydroxide.

For Lead: ammonium nitrate, chlorine trifluoride, hydrogen peroxide, sodium azide, zirconium, disodium acetylde, sodium acetylde and oxidants.

For Tin: halogens and halogen trifluorides, cupric nitrate, sodium and potassium peroxide, sulfur, and some acids.

For Cadmium: nitric acid, hydrochloric acid, hydrazoic acid, fused ammonium nitrate, elemental sulfur, selenium and tellurium. Does not react with alkalies.

Conditions to Avoid:

Heat, dusting and incompatibles.

11. Toxicological Information

Toxicological Data:

Bismuth- Oral rat LD50: 5g/kg.

Cadmium- Oral rat LD50: 2330 mg/kg; Inhalation rat LC50: 25 mg/m³/30M.

Tin investigated as a tumorigen; Lead and Cadmium investigated as a tumorigen, mutagen and reproductive effector.

Reproductive Toxicity:

Lead and other smelter emissions are human reproductive hazards. (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981). For cadmium: May damage the reproductive system.

Carcinogenicity:

For cadmium:

EPA / IRIS classification: Group B1 - Probable human carcinogen, limited human evidence.

Regulated by OSHA as a carcinogen.

For lead and inorganic lead compounds:

EPA / IRIS classification: Group B2 - Probable human carcinogen, sufficient animal evidence.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Bismuth Metal (7440-69-9)	No	No	None
Tin (7440-31-5)	No	No	None
Lead (7439-92-1)	No	No	2B
Cadmium (7440-43-9)	Yes	No	1

12. Ecological Information

Environmental Fate:

For lead and inorganic lead compounds:

When released into the soil, this material is not expected to leach into groundwater. This material may bioaccumulate to some extent.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate

analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Bismuth Metal (7440-69-9)	Yes	Yes	No	Yes
Tin (7440-31-5)	Yes	Yes	No	Yes
Lead (7439-92-1)	Yes	Yes	Yes	Yes
Cadmium (7440-43-9)	Yes	Yes	No	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	--Canada--		
		DSL	NDSL	Phil..
Bismuth Metal (7440-69-9)	Yes	Yes	No	Yes
Tin (7440-31-5)	Yes	Yes	No	Yes
Lead (7439-92-1)	Yes	Yes	No	Yes
Cadmium (7440-43-9)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Bismuth Metal (7440-69-9)	No	No	No	No
Tin (7440-31-5)	No	No	No	No
Lead (7439-92-1)	No	No	Yes	No
Cadmium (7440-43-9)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----			
Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8 (d)
Bismuth Metal (7440-69-9)	No	No	No
Tin (7440-31-5)	No	No	No
Lead (7439-92-1)	10	No	No
Cadmium (7440-43-9)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Mixture / Solid)

WARNING:

THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0

Label Hazard Warning:

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD, PROSTATE, AND REPRODUCTIVE SYSTEM. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure. DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe dust or fumes.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Keep away from heat, sparks and flame.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel.

Never give anything by mouth to an unconscious person. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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