

SAFETY DATA SHEET

1. Identification

Product identifier BernzOmatic Metalwork Solder, Silver-bearing acid core lead-free solder

Other means of identification

SDS number WC039

Recommended use General metalwork soldering

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer/Supplier Worthington Industries Incorporated
Address 1690 Lowery Street, Winston-Salem, NC 27101
United States
cylinders@worthingtonindustries.com

Telephone number 1-336-831-8601

Emergency telephone number 1-703-527-3887 International / CHEMTREC 1-800-424-9300 Domestic

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

Environmental hazards Not classified.

Label elements

Hazard symbol None.

Signal word None.

Hazard statement Very toxic to aquatic life.

Precautionary statements

Prevention Observe good industrial hygiene practices.

Response Wash thoroughly after handling.

Storage Store away from incompatible materials.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
TIN, ELEMENTAL	7440-31-5	90 - 100
COPPER, ELEMENTAL	7440-50-8	1 - 10
SILVER, ELEMENTAL	7440-22-4	< 1
Urea	57-13-6	< 1

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Skin contact	Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. If skin rash or an allergic skin reaction develops, get medical attention.
Eye contact	Contact with dust: Rinse immediately with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention if irritation develops or persists.
Ingestion	Immediately rinse mouth and drink a cupful of water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Only induce vomiting at the instruction of medical personnel. Get medical attention immediately.
Most important symptoms/effects, acute and delayed	Symptoms may include redness, oedema, drying, defatting and cracking of the skin. Nausea, vomiting. Diarrhoea. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye, mucous membranes and respiratory tract. Symptoms may include coughing, difficulty breathing and shortness of breath. Overexposure to copper fumes may cause fever, chills, congestion and headaches.
Indication of immediate medical attention and special treatment needed	Treat symptomatically. Exposure may aggravate pre-existing respiratory disorders. Symptoms may be delayed.
General information	Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media	Powder. Dry sand. Extinguish with foam, carbon dioxide or dry powder.
Unsuitable extinguishing media	Do not use water or halogenated extinguishing media.
Specific hazards arising from the chemical	Fire or high temperatures create: Metal oxides.
Special protective equipment and precautions for firefighters	Use standard firefighting procedures and consider the hazards of other involved materials. Use protective equipment appropriate for surrounding materials.
Fire fighting equipment/instructions	Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Avoid dust formation. Recover and recycle, if practical. Keep out of water supply.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground. Prevent further leakage or spillage if safe to do so. Do not contaminate water.

7. Handling and storage

Precautions for safe handling	Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid contact with skin and eyes. Do not get this material on clothing. Wash thoroughly after handling. Avoid release to the environment.
Conditions for safe storage, including any incompatibilities	Wear appropriate personal protective equipment (See Section 8). Avoid inhalation of dust and fumes. Do not eat, drink or smoke when using the product. Any surface that comes in contact with molten metal must be preheated or specially coated and rust free. Inadvertent contaminants to product such as moisture, ice, snow, grease, or oil can cause an explosion when charged to a molten metal bath or metal furnace (preheating metal will remove moisture from product). Keep away from food, drink and animal feeding stuffs. Store away from incompatible materials (see section 10 of the SDS). Store in tightly closed original container in a dry, cool and well-ventilated place. Keep out of reach of children.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
COPPER, ELEMENTAL (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
SILVER, ELEMENTAL (CAS 7440-22-4)	TWA	0.2 mg/m ³ 0.1 mg/m ³	Fume. Dust and fume.
TIN, ELEMENTAL (CAS 7440-31-5)	TWA	2 mg/m ³	

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value	Form
COPPER, ELEMENTAL (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
SILVER, ELEMENTAL (CAS 7440-22-4)	TWA	0.2 mg/m ³ 0.1 mg/m ³	Fume.
TIN, ELEMENTAL (CAS 7440-31-5)	TWA	2 mg/m ³	

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
COPPER, ELEMENTAL (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
SILVER, ELEMENTAL (CAS 7440-22-4)	STEL	0.2 mg/m ³ 0.03 mg/m ³	Fume.
TIN, ELEMENTAL (CAS 7440-31-5)	TWA	0.01 mg/m ³ 2 mg/m ³	

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value	Form
SILVER, ELEMENTAL (CAS 7440-22-4)	TWA	0.1 mg/m ³	Dust and fume.
TIN, ELEMENTAL (CAS 7440-31-5)	TWA	2 mg/m ³	

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
COPPER, ELEMENTAL (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and fume.
SILVER, ELEMENTAL (CAS 7440-22-4)	TWA	0.2 mg/m ³ 0.1 mg/m ³	Fume. Dust and fume.
TIN, ELEMENTAL (CAS 7440-31-5)	TWA	2 mg/m ³	

Canada. Quebec OELs. (Ministry of Labour - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value	Form
COPPER, ELEMENTAL (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
SILVER, ELEMENTAL (CAS 7440-22-4)	TWA	0.2 mg/m ³ 0.1 mg/m ³	Fume.
TIN, ELEMENTAL (CAS 7440-31-5)	TWA	2 mg/m ³	

Biological limit values

No biological exposure limits noted for the ingredient(s).

Exposure guidelines	No exposure standards allocated.
Appropriate engineering controls	Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust. Keep melting/soldering temperatures as low as possible to minimize the generation of fume. Shower, hand and eye washing facilities near the workplace are recommended.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear a face shield when working with molten material. Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. When handling hot material, use heat resistant gloves.
Other	Chemical resistant clothing is recommended. Heat resistant/insulated gloves and clothing are recommended when working with molten material.
Respiratory protection	Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Use a respirator when local exhaust or ventilation is not adequate to keep exposures below the OEL. In a confined space a supplied respirator may be required. Selection and use of respiratory protective equipment should be in accordance with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Silver to silver-gray metallic metal.
Physical state	Solid.
Form	Solid.
Colour	Silver to gray.
Odour	Odourless.
Odour threshold	Not available.
pH	Not applicable
Melting point/freezing point	Not available.
Initial boiling point and boiling range	227.2 - 250 °C (440.96 - 482 °F)
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Fine particles may form explosive mixtures with air.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour pressure	Not applicable
Vapour density	Not available.
Relative density	7.38 (H ₂ O=1)
Solubility(ies)	
Solubility (water)	Not soluble
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

Specific gravity 7.38

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerisation does not occur.
Conditions to avoid	Contact with incompatible materials. Avoid molten metal contact with water.
Incompatible materials	Acids. Magnesium. Chlorine. Turpentine. Acetylene Gas.
Hazardous decomposition products	Toxic metal oxides are emitted when heated above the melting point.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause respiratory irritation. Lung damage and possible pulmonary edema can result from dust exposure. Inhalation of powder or fumes may cause metal fume fever.
Skin contact	May cause skin irritation. Hot or molten material may produce thermal burns.
Eye contact	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eyes.
Ingestion	Ingestion of dusts generated during working operations may cause nausea and vomiting. Copper poisoning can result in hemolytic anemia and kidney, liver and spleen damage.

Symptoms related to the physical, chemical and toxicological characteristics	Contact with molten material may cause thermal burns. Symptoms may include redness, oedema, drying, defatting and cracking of the skin. Nausea, vomiting. Diarrhoea. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye, mucous membranes and respiratory tract. Symptoms may include coughing, difficulty breathing and shortness of breath. Overexposure to copper fumes may cause fever, chills, congestion and headaches.
---	---

Information on toxicological effects

Acute toxicity	High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. When heated, the vapours/fumes given off may cause respiratory tract irritation. Overexposure of Tin can cause irritation of the eyes, skin, mucous membranes, and respiratory system. Acute overexposure to Copper dust/fume can cause irritation of the eyes, nose, throat, and skin and under severe fume overexposure can cause metal fume fever with flu-like symptoms such as sweet metal taste, dry throat, coughing, fever and chills, tight chest, dyspnea, headache, blurred vision, back pain, nausea, vomiting, fatigue. Symptoms usually disappear within 24 hours. Copper may cause skin and hair discoloration. Inhalation of copper dusts may change the gums and mucous lining of the mouth which is generally attributable to localized tissue effect rather than general toxicity.
-----------------------	---

Components	Species	Test results
Urea (CAS 57-13-6)		
Acute		
<i>Oral</i>		
LD50	Rat	8471 mg/kg
Skin corrosion/irritation	Not classified.	
Serious eye damage/eye irritation	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye.	
Respiratory or skin sensitisation		
Respiratory sensitisation	Not classified.	
Skin sensitisation	No sensitising effects known.	
Germ cell mutagenicity	Not classified.	
Carcinogenicity	Not classifiable as to carcinogenicity to humans.	
Reproductive toxicity	Not classified.	
Specific target organ toxicity - single exposure	Not classified.	
Specific target organ toxicity - repeated exposure	Not classified.	
Aspiration hazard	Due to the physical form of the product it is not an aspiration hazard.	

Chronic effects Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Overexposure to Tin can result in benign pneumoconiosis (stannous). This form of pneumoconiosis produces progressive x-ray changes of the lungs as long as exposure exists, but there is no distinctive fibrosis, no evidence of disability and no special complicating factors. Ingestion of silver may cause a permanently benign bluish gray discoloration to the skin (argyria).

Further information Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Overexposure to Tin can result in benign pneumoconiosis (stannous). This form of pneumoconiosis produces progressive x-ray changes of the lungs as long as exposure exists, but there is no distinctive fibrosis, no evidence of disability and no special complicating factors. Ingestion of silver may cause a permanently benign bluish gray discoloration to the skin (argyria).

12. Ecological information

Ecotoxicity Alloys in massive forms present a limited hazard for the environment.

Components		Species	Test results
Urea (CAS 57-13-6)			
Aquatic			
Crustacea	EC50	Water flea (<i>Daphnia magna</i>)	3910 mg/l, 48 hours
Fish	LC50	Giant gourami (<i>Colisa fasciata</i>)	5 mg/l, 96 hours

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential No data available.

Mobility in soil Alloys in massive forms are not mobile in the environment.

Other adverse effects None known.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations Dispose in accordance with all applicable regulations. Dispose of in accordance with local regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company. Product contains silver a hazardous waste constituent regulated under 40 CFR 261.24.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Scrapped material should be sent for refining to recover precious metal content. Solid metal and alloys in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. Dispose of in accordance with local regulations.

14. Transport information

TDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

Canadian regulations This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date 27-July-2016

Revision date -

Version No. 01

References
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
IARC Monographs. Overall Evaluation of Carcinogenicity
HSDB® - Hazardous Substances Data Bank
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
GOST 30333-2007 - Chemical production safety passport. General requirements
JIS Z 7252:2009 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"
JIS Z 7253:2012 Hazard communication of chemicals based on GHS – Labelling and Safety Data Sheet (SDS)

Disclaimer
All information in this Safety Data Sheet is believed to be accurate and reliable. However, no guarantee or warranty of any kind is made with regard to the accuracy of information or the suitability of the recommendations contained herein. It is the user's responsibility to assess the safety and toxicity of this product under their own conditions of use and to comply with all applicable laws and regulations.