



SAFETY DATA SHEET

1. Identification

Product identifier **Worthington Brazing Wire 45% & 56% Silver**

Other means of identification

SDS number WC025

Recommended use Brazing rod.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer/Supplier Worthington Cylinder Corporation

Address 200 Old Wilson Bridge Road

Columbus, OH 43085

United States

Email: cylinders@worthingtonindustries.com

Telephone Number: 866-928-2657

CHEMTREC - 24 HOURS:

Within US and Canada 800-424-9300

Outside US and Canada +1 703-741-5970 (collect calls accepted)

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Hazard symbol None.

Signal word None.

Hazard statement None.

Precautionary statement

Prevention Observe good industrial hygiene practices.

Response Wash thoroughly after handling.

Storage Store away from incompatible materials.

Disposal Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC) Molten material will produce thermal burns.

3. Composition/information on ingredients

Mixtures

| Chemical name | CAS number | % |
|-----------------|------------|----------|
| Silver | 7440-22-4 | 20 - 70 |
| Copper | 7440-50-8 | 3 - 45 |
| Zinc (as oxide) | 7440-66-6 | 1 - 35 |
| Tin | 7440-31-5 | 0.5 - 30 |

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

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|---|---|
| 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 | 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 | 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 | Dust and fumes may irritate eyes, skin and upper respiratory tract. Contact with molten material may cause thermal burns. |
| 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

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| Suitable extinguishing media | Use fire-extinguishing media appropriate for surrounding materials. |
| 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 | Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |
| Fire fighting equipment/instructions | Move containers from fire area if you can do it without risk. |
| 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

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| Personal precautions, protective equipment and emergency procedures | Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Wear protective clothing as described in Section 8 of this SDS. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. |
| Methods and materials for containment and cleaning up | Stop leak if you can do so without risk. Local authorities should be advised if significant spillages cannot be contained. For a dry material spill, use a HEPA (high efficiency particle air) vacuum to collect material and place in a sealable container for disposal. Avoid dust formation. Recover and recycle, if practical. Keep out of water supplies and sewers. |
| Environmental precautions | Prevent further leakage or spillage if safe to do so. Do not contaminate water. If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA). |

7. Handling and storage

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|---|---|
| Precautions for safe handling | Wear appropriate personal protective equipment (See Section 8). Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid inhalation of dust and fumes. Avoid contact with skin and eyes. Do not get this material on clothing. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Avoid release to the environment. 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). |
| Conditions for safe storage, including any incompatibilities | Store in tightly closed original container in a dry, cool and well-ventilated place. Store in a closed container away from incompatible materials. Keep out of reach of children. Keep away from food, drink and animal feedingstuffs. |

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

| Components | Type | Value | Form |
|---------------------------------|------|--|--|
| Copper (CAS 7440-50-8) | PEL | 1 mg/m ³ 0.1 mg/m ³ | Dust and mist. Fume. |
| Silver (CAS 7440-22-4) | PEL | 0.01 mg/m ³ | |
| Tin (CAS 7440-31-5) | PEL | 2 mg/m ³ | |
| Zinc (as oxide) (CAS 7440-66-6) | PEL | 5 mg/m ³ 5 mg/m ³ 15 mg/m ³ | Respirable fraction. Fume. Total dust. |

ACGIH

| Components | Type | Value | Form |
|------------------------|------|--|-------------------------|
| Copper (CAS 7440-50-8) | TWA | 1 mg/m ³ 0.2 mg/m ³ | Dust and mist. Fume. |

US. ACGIH Threshold Limit Values

| Components | Type | Value | Form |
|---------------------------------|------|-----------------------|----------------------|
| Silver (CAS 7440-22-4) | TWA | 0.1 mg/m ³ | Dust and fume. |
| Tin (CAS 7440-31-5) | TWA | 2 mg/m ³ | |
| Zinc (as oxide) (CAS 7440-66-6) | STEL | 10 mg/m ³ | Respirable fraction. |
| | TWA | 2 mg/m ³ | Respirable fraction. |

US. NIOSH: Pocket Guide to Chemical Hazards

| Components | Type | Value | Form |
|---------------------------------|---------|--|----------------|
| Copper (CAS 7440-50-8) | TWA | 1 mg/m ³ | Dust and mist. |
| Silver (CAS 7440-22-4) | TWA | 0.01 mg/m ³ | Dust. |
| Tin (CAS 7440-31-5) | TWA | 2 mg/m ³ | |
| Zinc (as oxide) (CAS 7440-66-6) | Ceiling | 15 mg/m ³ | Dust. |
| | STEL | 10 mg/m ³ | Fume. |
| | TWA | 5 mg/m ³ 5 mg/m ³ | Fume. Dust. |

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 minimize 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 safety glasses with side shields (or goggles). Wear a face shield when working with molten material.

Skin protection

Hand protection

Wear protective gloves (i.e. latex, nitrile, neoprene).

Other

Chemical resistant clothing is recommended.

Respiratory protection

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. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

Thermal hazards

Heat resistant/insulated gloves and clothing are recommended when working with molten material.

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 | Metallic wire, rod or strip. |
| Physical state | Solid. |
| Form | Wire. |
| Color | Not available. |
| Odor | Odorless. |
| Odor threshold | Not applicable. |
| pH | Not applicable. |
| Melting point/freezing point | 1194.98 °F (646.1 °C) |
| Initial boiling point and boiling range | Not available. |
| Flash point | Not applicable. |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not available. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | Not available. |
| Flammability limit - upper (%) | Not available. |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - lower (%) temperature | Not applicable. |
| Explosive limit - upper (%) | Not available. |
| Explosive limit - upper (%) temperature | Not applicable. |
| Vapor pressure | Not applicable. |
| Vapor density | Not applicable. |
| Relative density | 8.5 - 8.7 |
| Solubility(ies) | |
| Solubility (water) | Not soluble |
| Partition coefficient (n-octanol/water) | Not available. |
| Auto-ignition temperature | Not applicable. |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |

10. Stability and reactivity

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|---|---|
| Reactivity | The product is non-reactive under normal conditions of use, storage and transport. |
| Chemical stability | Material is stable under normal conditions. |
| Possibility of hazardous reactions | Hazardous polymerization does not occur. |
| Conditions to avoid | Contact with incompatible materials. Avoid molten metal contact with water. |
| Incompatible materials | Strong oxidizers, strong acids, and strong bases. Acetylene. Magnesium. Ammonium nitrate. Hydrogen sulfide. |
| Hazardous decomposition products | Toxic metal oxides are emitted when heated above the melting point. |

11. Toxicological information

Information on likely routes of exposure

| | |
|-------------------|---|
| Inhalation | Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the mucous membranes and respiratory tract. Lung damage and possible pulmonary edema can result from dust exposure. Inhalation of fumes may cause a flu-like illness called metal fume fever. |
|-------------------|---|

| | |
|---|--|
| Skin contact | Dust may irritate skin. Contact with molten material may cause thermal burns. |
| Eye contact | Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye. |
| 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 | Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye, mucous membranes and respiratory tract. Contact with molten material may cause thermal burns. |

Information on toxicological effects

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|-----------------------|--|
| Acute toxicity | High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. When heated, the vapors/fumes given off may cause respiratory tract irritation. 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. Overexposure of Tin can cause irritation of the eyes, skin, mucous membranes, and respiratory system. |
|-----------------------|--|

| Components | Species | Test Results |
|---|--|--------------|
| Zinc (as oxide) (CAS 7440-66-6) | | |
| Acute | | |
| <i>Oral</i> | | |
| LD50 | Rat | 630 mg/kg |
| Skin corrosion/irritation | Dust may irritate skin. | |
| 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 sensitization | | |
| Respiratory sensitization | No respiratory sensitizing effects known. | |
| Skin sensitization | No sensitizing effects known. | |
| Germ cell mutagenicity | No data available. | |
| Carcinogenicity | Not classifiable as to carcinogenicity to humans. | |
| OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) | Not listed. | |
| Reproductive toxicity | No data available. | |
| Specific target organ toxicity - single exposure | Not classified. | |
| Specific target organ toxicity - repeated exposure | Not classified. | |
| Aspiration hazard | Not relevant, due to the form of the product. | |
| Chronic effects | 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 | No other specific acute or chronic health impact noted. | |

12. Ecological information

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|--------------------|---|
| Ecotoxicity | Alloys in massive forms present a limited hazard for the environment. The product contains a substance which is very toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment. |
|--------------------|---|

| Components | Species | Test Results |
|--------------------------------------|-----------------------------------|----------------------|
| Zinc (as oxide) (CAS 7440-66-6) | | |
| Aquatic | | |
| Crustacea | LC50 Daphnia magna | 0.068 mg/l, 48 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 expected.

13. Disposal considerations

Disposal instructions Dispose in accordance with all applicable regulations.
Local disposal regulations Dispose of in accordance with local regulations.
Hazardous waste code Waste codes should be assigned by the user based on the application for which the product was used.
Waste from residues / unused products Dispose of in accordance with local regulations. 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.

14. Transport information

DOT

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

US federal regulations Under some use conditions, this material may be considered to be hazardous in accordance with OSHA 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

| | |
|---------------------------------|--------|
| Copper (CAS 7440-50-8) | LISTED |
| Silver (CAS 7440-22-4) | LISTED |
| Zinc (as oxide) (CAS 7440-66-6) | LISTED |

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

| Chemical name | CAS number | % by wt. |
|-----------------|------------|----------|
| Silver | 7440-22-4 | 20 - 70 |
| Copper | 7440-50-8 | 3 - 45 |
| Zinc (as oxide) | 7440-66-6 | 1 - 35 |

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8)
Silver (CAS 7440-22-4)
Tin (CAS 7440-31-5)
Zinc (as oxide) (CAS 7440-66-6)

US. New Jersey Worker and Community Right-to-Know Act

Copper (CAS 7440-50-8)
Silver (CAS 7440-22-4)
Tin (CAS 7440-31-5)
Zinc (as oxide) (CAS 7440-66-6)

US. Pennsylvania Worker and Community Right-to-Know Law

Copper (CAS 7440-50-8)
Silver (CAS 7440-22-4)
Tin (CAS 7440-31-5)
Zinc (as oxide) (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8)
Silver (CAS 7440-22-4)
Zinc (as oxide) (CAS 7440-66-6)

US. California Proposition 65

Not Listed.

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, including date of preparation or last revision

Issue date 28-May-2015
Revision date -
Version # 01
Further information HMIS® is a registered trade and service mark of the NPCA.
HMIS® ratings Health: 1
Flammability: 0
Physical hazard: 0

NFPA ratings



References

ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

Disclaimer

All information in this Material 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.