

SAFETY DATA SHEET

1. Identification

Product identifier Aluminum Bronze Alloys

Other means of identification

SDS number 101

Product code C95200, C95210, C95220, C95400, C95420, C95500, C95510, C95800, C95900,

AMS-4640, AMS-4870, AMS-4871, AMS-4880, AMS-4881, A380

Recommended use Manufacturing

Recommended restrictions Use in accordance with supplier's recommendations.

Manufacturer / Importer / Supplier / Distributor information
Company Name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Spreetsboro, OH 44241

Telephone Corporate: 330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazardsNot classified.Category 1Health hazardsSensitization, respiratoryCategory 1

Sensitization, skin
Category 2
Carcinogenicity

Category 1 (Lung, central nervous system)

Specific target organ toxicity, repeated

exposure

OSHA hazard(s) Not classified.

Label elements Hazard symbol



Signal word Danger

Hazard statement May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic

skin reaction. Suspected of causing cancer. Causes damage to organs (Lung, centaral nervous

system) through prolonged or repeated exposure.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read

and understood. Use personal protective equipment as required. Do not breathe

dust/fume/gas/mist/vapors/spray. In case of inadequate ventilation wear respiratory protection. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Wear protective

gloves/protective clothing/eye protection/face protection.

Response If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If

experiencing respiratory symptoms: Call a poison center/doctor. If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing

before reuse. If exposed or concerned: Get medical advice/attention.

Storage Store locked up.

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

Hazard(s) not otherwise classified (HNOC)

Aluminum Bronze Alloys

(s) not otherwise Not classified.

3. Composition/information on ingredients

Mixture

SDS #101 Version: 1.0 Issue date: June 01, 2015 1 / 8

Hazardous components Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	71-90
Aluminum		7429-90-5	7-16
Manganese		7439-96-5	0-14
Iron		7439-89-6	2-6.5
Nickel		7440-02-0	0-6
Cobalt		7440-48-4	0-3
Silicon		7440-21-3	0-1.5
Zinc		7440-66-6	<0.5
Tin		7440-31-5	<0.3

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

In case of exposure to fumes or particulates: Move to fresh air. Get medical attention if discomfort persists.

Skin contact

Contact with dust: Wash skin with soap and water. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

Irritation of nose and throat. Irritation of eyes and mucous membranes. Cough. Shortness of

Most important symptoms/effects, acute and delayed

breath. Wheezing. Sensitization.

Indication of immediate medical attention and special treatment needed

Treat symptomatically. Symptoms may be delayed.

General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing

media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal: Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, ferronickel may form highly toxic substances: iron carbonyl and nickel carbonyl, a known carcinogen.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions

Specific methods

Move containers from fire area if you can do it without risk.

Move containers from fire area if you can do so without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

SDS #101 Version: 1.0 Issue date: June 01, 2015 2 / 8

Methods and materials for containment and cleaning up

Sweep up or vacuum up spillage and collect in suitable container for disposal. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. If not possible, gently moisten dust before it is collected with shovel, broom or the like. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. Avoid dust formation. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment.

7. Handling and storage

Precautions for safe handling

Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep dry. Store away from incompatible materials.

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
Aluminum (CAS 7429-90-5)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total dust.
Cobalt (CAS 7440-48-4)	PEL	0.1 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Manganese (CAS	Ceiling	5 mg/m3	Fume.
7439-96-5)	•	· ·	
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Silicon (CAS 7440-21-3)	PEL	5 mg/m3	Respirable fraction
		15 mg/m3	Total dust.
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit Value	s		
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction
Cobalt (CAS 7440-48-4)	TWA	0.02 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
US. NIOSH: Pocket Guide to Cher	nical Hazards		
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	REL	5 mg/m3	Respirable.
Alullillulli (CAS 1423-30-3)			
Aldiffillatif (CAS 7423-30-3)		5 mg/m3	Welding fume or
Auminum (CAS 7429-90-3)		5 mg/m3	pyrophoric powder.
,		5 mg/m3 10 mg/m3	pyrophoric powder Total
Cobalt (CAS 7440-48-4)	REL	5 mg/m3 10 mg/m3 0.05 mg/m3	pyrophoric powder Total Dust and fume.
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8)	REL REL	5 mg/m3 10 mg/m3 0.05 mg/m3 1 mg/m3	pyrophoric powder Total
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS	REL	5 mg/m3 10 mg/m3 0.05 mg/m3	pyrophoric powder Total Dust and fume.
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8)	REL REL REL	5 mg/m3 10 mg/m3 0.05 mg/m3 1 mg/m3 1 mg/m3	pyrophoric powder Total Dust and fume. Dust and mist. Fume.
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5)	REL REL REL STEL	5 mg/m3 10 mg/m3 0.05 mg/m3 1 mg/m3 1 mg/m3	pyrophoric powder Total Dust and fume. Dust and mist.
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)	REL REL REL STEL REL	5 mg/m3 10 mg/m3 0.05 mg/m3 1 mg/m3 1 mg/m3 3 mg/m3 0.015 mg/m3	pyrophoric powder Total Dust and fume. Dust and mist. Fume.
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5)	REL REL REL STEL	5 mg/m3 10 mg/m3 0.05 mg/m3 1 mg/m3 1 mg/m3 0.015 mg/m3 5 mg/m3	pyrophoric powder Total Dust and fume. Dust and mist. Fume.
Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)	REL REL REL STEL REL	5 mg/m3 10 mg/m3 0.05 mg/m3 1 mg/m3 1 mg/m3 3 mg/m3 0.015 mg/m3	pyrophoric powder Total Dust and fume. Dust and mist. Fume.

Aluminum Bronze Alloys SDS #101 Version: 1.0

Issue date: June 01, 2015 3 / 8

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Cobalt (CAS 7440-48-4)	1 μg/l	Cobalt	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety

glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles,

during sawing, grinding, or machining.

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available.

pH Unknown.

Melting point/freezing point 1814 - 1929.2 °F (990 - 1054 °C)

Initial boiling point and boiling

range

Not available.

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

(%)

Flammability limit - upper

Not available.

(70)

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Vapor density Not available Relative density 7.5 - 9

Solubility(ies) Insoluble in water.

Aluminum Bronze Alloys

SDS #101 Version: 1.0 | Issue date: June 01, 2015 | 4 / 8

Partition coefficient (n-octanol/water)

Not available.

Auto-ignition temperature Not available. **Decomposition temperature** Not available. Not available. Viscosity

Other information

0.27 - 0.323 lb/in3 @ 68 F **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Massive metal is stable and non reactive under normal conditions of use, storage and transport. Hazardous polymerization does not occur. Hot molten material will react violently with water

Possibility of hazardous

reactions Conditions to avoid resulting in spattering and fuming.

Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides.

11. Toxicological information

Information on likely routes of exposure

Not relevant, due to the form of the product. However, ingestion of dusts generated during Ingestion

working operations may cause nausea and vomiting.

Inhalation May cause allergic respiratory reaction. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the mucous membranes and respiratory tract. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin contact May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers

> allergic to nickel may develop eczema or rashes. Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like

attack, with wheezing, bronchospasm, and dyspnea.

Molten material will produce thermal burns. Elevated temperatures or mechanical action may form Eye contact

dust and fumes which may be irritating to the eye. Acute exposure to cobalt metal, dust, and fume

may cause irritation of skin and eyes.

Symptoms related to the physical, chemical and toxicological characteristics

Irritation of nose and throat. Irritation of eyes and mucous membranes. Coughing. Wheezing.

Shortness of breath. Sensitization.

Information on toxicological effects

Acute toxicity

Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm, and dyspnea. Ingestion of cobalt may cause nausea, vomiting, diarrhea, and a sensation of hotness. High concentrations of freshly formed fumes/dusts of metal oxides can produce

symptoms of metal fume fever.

Components **Species Test Results**

Silicon (CAS 7440-21-3)

Acute Oral

LD50 Rat 3150 mg/kg

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

burns.

Serious eye damage/eye irritation

Dust from machining operation in the eyes will cause irritation.

Respiratory sensitization May cause sensitization by inhalation.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause sensitization by skin contact. Pre-existing skin conditions including dermatitis might be

aggravated by exposure to this product.

Germ cell mutagenicity Suspected of causing genetic defects.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data. Suspected of causing cancer.

Limited evidence of a carcinogenic effect.

Aluminum Bronze Alloys

SDS #101 Version: 1.0 5/8 Issue date: June 01, 2015

IARC Monographs. Overall Evaluation of Carcinogenicity

Cobalt (CAS 7440-48-4)

Nickel (CAS 7440-02-0)

2B Possibly carcinogenic to humans.

1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity

In experimental animal studies, cobalt produces adverse developmental effects at doses that produce maternal toxicity. There are no human data on cobalt exposure during pregnancy. Nickel: Has shown teratogenic effects in laboratory animals.

Specific target organ toxicity -

single exposure

High concentrations: May cause respiratory irritation.

Specific target organ toxicity -

repeated exposure

Not available.

Aspiration hazard

Not applicable.

Chronic effects

Harmful: danger of serious damage to health by prolonged exposure through inhalation. Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Chronic exposure to breathing low levels of manganese dust or fume over a long period of time can result in "manganism," a disease of the central nervous system similar to Parkinson's Disease, gait impairment, muscle spasms and behavioral changes. Chronic inhalation of metallic oxide dust/fume may cause metal fume fever.

Further information

Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet

radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary

discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity

Alloys in massive forms present a limited hazard for the environment. The product contains a

substance which may cause long-term adverse effects in the environment.

Components Species Test Results

Iron (CAS 7439-89-6)

Aquatic

Fish LC50 Channel catfish (Ictalurus punctatus) > 500 mg/l, 96 hours

Persistence and degradability
The product is not biodegradable.

Bioaccumulative potentialThe product contains potentially bioaccumulating substances.Mobility in soilAlloys in massive forms are not mobile in the environment.Mobility in generalAlloys in massive forms are not mobile in the environment.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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 Not applicable.

14. Transport information

DOT

Not regulated as a hazardous material by DOT.

IATA

Not regulated as a dangerous good.

IMDG

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and

Not applicable.

the IBC Code

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

Aluminum Bronze Alloys
SDS #101 Version: 1.0 Issue date: June 01, 2015 6 / 8

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

CERCLA Hazardous Substance List (40 CFR 302.4)

 Cobalt (CAS 7440-48-4)
 LISTED

 Copper (CAS 7440-50-8)
 LISTED

 Manganese (CAS 7439-96-5)
 LISTED

 Nickel (CAS 7440-02-0)
 LISTED

 Zinc (CAS 7440-66-6)
 LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Nο

Hazard categories Immediate Hazard - Yes

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

SARA 302 Extremely

hazardous substance

SARA 311/312 Hazardous Yes

chemical

Other federal regulations

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

Not regulated.

Cobalt (CAS 7440-48-4) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

US state regulations WARNING: This product contains a chemical known to the State of California to cause cancer.

US. Massachusetts RTK - Substance List

Aluminum (CAS 7429-90-5) Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Silicon (CAS 7440-21-3) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

 Aluminum (CAS 7429-90-5)
 500 LBS

 Copper (CAS 7440-50-8)
 500 LBS

 Manganese (CAS 7439-96-5)
 500 LBS

 Nickel (CAS 7440-02-0)
 500 LBS

 Zinc (CAS 7440-66-6)
 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Aluminum (CAS 7429-90-5) Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Silicon (CAS 7440-21-3) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

SDS #101 Version: 1.0 Issue date: June 01, 2015 7 / 8

US. Rhode Island RTK

Aluminum (CAS 7429-90-5) Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Silicon (CAS 7440-21-3) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Cobalt (CAS 7440-48-4) Nickel (CAS 7440-02-0)

International Inventories

Country(s) or region

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

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

Toxic Substances Control Act (TSCA) Inventory

16. Other information, including date of preparation or last version

Inventory name

Issue date June 01, 2015

Version: 1.0

United States & Puerto Rico

Further information Not available.

References 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

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

On inventory (yes/no)*

Yes

Aluminum Bronze Alloys

SDS #101 Version: 1.0 Issue date: June 01, 2015 8 / 8



SAFETY DATA SHEET

1. Identification

Product identifier Tin Bronze Alloys

Other means of identification

SDS number 102

Product code C90200, C90300, C90500, C90700, C90800, C90810, C91000, C91100, C91300, C91400,

C91600, C91700

Recommended useManufacturing **Recommended restrictions**Not assigned.

Manufacturer / Importer / Supplier / Distributor information

Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Spectrum Machine, Inc.

Telephone Corporate: 330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Sensitization, skin Category 1

Carcinogenicity Category 2
Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated Category 2 (Lung, central nervous system)

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word Danger

Hazard statement May cause an allergic skin reaction. May cause damage to organs (Lung, central nervous

system) through prolonged or repeated exposure. Suspected of causing cancer. May damage

fertility or the unborn child.

Precautionary statement

Prevention Do not breathe fumes and dusts. Obtain special instructions before use. Do not handle until all

safety precautions have been read and understood. Use personal protective equipment as

required. Contaminated work clothing should not be allowed out of the workplace.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical

advice/attention. Get medical advice/attention if you feel unwell.

Storage Store locked up.

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

Hazard(s) not otherwise

classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 3

long-term hazard

3. Composition/information on ingredients

Mixture

#102 Version: 1.0 Issue date: June 01, 2015

Hazardous components			
Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	84-94
Tin		7440-31-5	4.5-17
Nickel		7440-02-0	0-6
Zinc		7440-66-6	1-5
Lead		7439-92-1	0-1

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation Skin contact In case of exposure to fumes or particulates: Get medical attention immediately.

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions

should be treated promptly with thorough cleansing of the affected area.

Eye contact Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any

contact lenses and open eyelids wide apart.

Ingestion Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

Treat symptomatically. Symptoms may be delayed.

personnel. Get medical attention if any discomfort continues.

Most important symptoms/effects, acute and

delayed

Indication of immediate medical attention and special

treatment needed

General information

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

gastro-intestinal or central nervous system disturbances and anemia.

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Unsuitable extinguishing

media

Specific hazards arising from the chemical

Special protective equipment

and precautions for firefighters

Fire-fighting equipment/instructions Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal:

Explosion hazard could result. During fire, gases hazardous to health may be formed. Solid metal is not flammable; however,

finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

Tin Bronze Alloys SDS #102 Version: 1.0

2/8 Issue date: June 01, 2015

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for Ai	r Contaminants (29 CFR 1910.	1000)	
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit Value	9 S		

١.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Туре	Value	Form
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	

Biological limit values

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

Tin Bronze Alloys SDS #102 Version: 1.0

3 / 8 Issue date: June 01, 2015

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available. Unknown. pН

Melting point/freezing point 1832 °F (1000 °C) Initial boiling point and boiling Not available.

range

Not available. Flash point Not available. **Evaporation rate** Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

Flammability limit - upper

(%)

Not available.

Not available. Explosive limit - lower (%) Explosive limit - upper (%) Not available. Not available. Vapor pressure Not available. Vapor density

8 78 Relative density

Insoluble in water. Solubility(ies) Partition coefficient

(n-octanol/water)

Not available.

Not available. **Auto-ignition temperature** Not available. **Decomposition temperature** Not available. Viscosity

Other information

0.317 lb/in3 **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Tin Bronze Alloys SDS

4/8 #102 Version: 1.0 Issue date: June 01, 2015

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Not relevant, due to the form of the product. However, ingestion of dusts generated during Ingestion

working operations may cause nausea and vomiting.

Inhalation May cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust

and fumes which may be irritating to the mucous membranes and respiratory tract.

May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers Skin contact

allergic to nickel may develop eczema or rashes.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of Acute toxicity

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization Not classified.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Possible cancer hazard - may cause cancer based on animal data. Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Specific target organ toxicity single exposure

Not available.

Specific target organ toxicity -

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central nervous system.

repeated exposure

Not available.

Aspiration hazard Chronic effects

Reproductive toxicity

Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information

Lead is accumulated in the body and may cause damage to the brain and nervous system after prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Tin Bronze Alloys SDS

5/8 #102 Version: 1.0 Issue date: June 01, 2015

Components Species Test Results

Lead (CAS 7439-92-1)

LC50 Rainbow trout, donaldson trout

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potentialThe product contains potentially bioaccumulating substances.Mobility in soilAlloys in massive forms are not mobile in the environment.Mobility in generalAlloys in massive forms are not mobile in the environment.

Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructionsThis material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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.

1.17 mg/l, 96 Hours

Contaminated packaging Not applicable.

14. Transport information

DOT

Not regulated as a hazardous material by DOT.

IATA

Not regulated as a dangerous good.

IMDG

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and

No information available.

the IBC Code

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

 Copper (CAS 7440-50-8)
 LISTED

 Lead (CAS 7439-92-1)
 LISTED

 Nickel (CAS 7440-02-0)
 LISTED

 Zinc (CAS 7440-66-6)
 LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

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

SARA 302 Extremely

hazardous substance

No

SARA 311/312 Hazardous

Yes

chemical

Other federal regulations

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

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

#102 Version: 1.0 Issue date: June 01, 2015

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

US state regulations WARNING: This product contains chemicals known to the State of California to cause cancer

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

 Copper (CAS 7440-50-8)
 500 LBS

 Lead (CAS 7439-92-1)
 500 LBS

 Nickel (CAS 7440-02-0)
 500 LBS

 Zinc (CAS 7440-66-6)
 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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
*	and in a with the inventory many increases a designate and by the analysis and a second and the	

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

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

#102 Version: 1.0 Issue date: June 01, 2015

References

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

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

Tin Bronze Alloys SDS #102 Version: 1.0

lssue date: June 01, 2015



SAFETY DATA SHEET

1. Identification

Product identifier Leaded Tin Bronze Alloys

Other means of identification

SDS number 103

Product code C92200, C92300, C92310, C92410, C92700, C92900, C93100, C93200, C93300, C93400,

C93600, C93700, C93800

Recommended useManufacturing **Recommended restrictions**Not assigned.

Manufacturer / Importer / Supplier / Distributor information

Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Acute toxicity, oral Category 4

Acute toxicity, inhalation

Sensitization, skin

Carcinogenicity

Category 1

Category 2

Category 1

Category 1

Category 1

Reproductive toxicity (fertility, the unborn

child)

Specific target organ toxicity, repeated

oversure

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word Danger

Hazard statement Harmful if swallowed. Harmful if inhaled. May cause an allergic skin reaction. Suspected of

causing cancer. May damage fertility or the unborn child. Causes damage to organs (Lung,

Category 1 (Lung, central nervous system)

central nervous system) through prolonged or repeated exposure.

Precautionary statement

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not

breathe fumes and dusts. Use only outdoors or in a well-ventilated area. Obtain special instructions before use. Do not handle until all safety precautions have been read and

understood. Use personal protective equipment as required. Contaminated work clothing should

not be allowed out of the workplace.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. If inhaled: Remove person to

fresh air and keep comfortable for breathing. If swallowed: Rinse mouth.

Storage Store locked up.

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

Hazard(s) not otherwise

classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 1

acute hazard

Leaded Tin Bronze Alloys

SDS #103 Version: 1.0 Issue date: June 01, 2015

1 / 8

3. Composition/information on ingredients

Mixture

Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	50-90
Lead		7439-92-1	0.005-34
Nickel		7440-02-0	0.005-32
Zinc		7440-66-6	0.005-26
Tin		7440-31-5	0.005-20
Antimony		7440-36-0	0.005-1.5

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation

In case of exposure to fumes or particulates: Get medical attention immediately.

Skin contact

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any contact lenses and open eyelids wide apart.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

M

Most important symptoms/effects, acute and

delayed

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

gastro-intestinal or central nervous system disturbances and anemia.

Indication of immediate medical attention and special treatment needed

General information

Treat symptomatically. Symptoms may be delayed.

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing

media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal:

Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions

Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Туре	Value
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3

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

Components	Туре	Value	Form
Antimony (CAS 7440-36-0)	PEL	0.5 mg/m3	_
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	

US. ACGIH Threshold Limit Values

Components	Туре	Value	Form
Antimony (CAS 7440-36-0)	TWA	0.5 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Туре	Value	Form
Antimony (CAS 7440-36-0)	REL	0.5 mg/m3	
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	

Biological limit values

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering

controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

Skin protection

Hand protection

Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None

Odor threshold Not available. рΗ Not available. 1790.6 °F (977 °C) Melting point/freezing point

Initial boiling point and boiling

range

Not available.

Not available. Flash point **Evaporation rate** Not available. Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

(%)

Not available.

Flammability limit - upper

(%)

Not available.

Not available. Explosive limit - lower (%) Not available. Explosive limit - upper (%) Not available. Vapor pressure Not available. Vapor density

7.5 - 9Relative density

Solubility(ies) Insoluble in water. Not available. **Partition coefficient**

(n-octanol/water)

Viscosity

Auto-ignition temperature Decomposition temperature

Not available. Not available. Not available.

Issue date: June 01, 2015

Leaded Tin Bronze Alloys SDS #103 Version: 1.0

4/8

Other information

0.27 - 0.323 lb/in3 **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting. Harmful if swallowed.

Harmful by inhalation. May cause respiratory tract irritation. Elevated temperatures or mechanical Inhalation

action may form dust and fumes which may be irritating to the mucous membranes and

respiratory tract.

Skin contact May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers

> allergic to nickel may develop eczema or rashes. Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like

attack, with wheezing, bronchospasm, and dyspnea.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

Acute toxicity High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Not classified.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization

Skin sensitization

Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Possible cancer hazard - may cause cancer based on animal data. Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Issue date: June 01, 2015

Specific target organ toxicity -

single exposure

Reproductive toxicity

Not available.

Specific target organ toxicity repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central

nervous system.

Not available **Aspiration hazard**

Leaded Tin Bronze Alloys SDS #103 Version: 1.0

5/8

Chronic effects

Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead to begin proumospiesis (stanposis). Chronic inhalation of metallic exide dust/fume may cause

to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information Lead is accumulated in the body and may cause damage to the brain and nervous system after

prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects.

Components Species Test Results
Antimony (CAS 7440-36-0)

nony (CAS 7440-36-0)

Aquatic

Fish LC50 Sheepshead minnow (Cyprinodon 6.2 - 8.3 mg/l, 96 hours

variegatus)

Lead (CAS 7439-92-1)

LC50 Rainbow trout, donaldson trout 1.17 mg/l, 96 Hours

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potentialThe product contains potentially bioaccumulating substances.Mobility in soilAlloys in massive forms are not mobile in the environment.Mobility in generalAlloys in massive forms are not mobile in the environment.

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructionsThis material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

lues / unused Recover and recycle, if practical. 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 Not applicable.

14. Transport information

DOT

UN number UN3077

UN proper shipping name Environmentally hazardous substances, solid, n.o.s. (Lead RQ = 79 LBS)

Transport hazard class(es)

Subsidary class(es) Not available.

Packing group III

Special precautions for user Not available.

Labels required 9

Special provisions 8, 146, B54, IB8, IP3, N20, T1, TP33

Packaging exceptions 155
Packaging non bulk 213
Packaging bulk 240

IATA

UN number UN3077

UN proper shipping name Environmentally hazardous substance, solid, n.o.s. (Lead)

Transport hazard class(es) 9
Subsidary class(es) Packaging group III
Labels required 9
ERG Code 9L

Special precautions for user Not available.

IMDG

UN number UN3077

UN proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead), MARINE

POLLUTANT

Transport hazard class(es) 9
Subsidary class(es) Packaging group |||

Leaded Tin Bronze Alloys

SDS #103 Version: 1.0 Issue date: June 01, 2015

Environmental hazards

Marine pollutantYesLabels required9EmSF-A, S-FSpecial precautions for userNot available.

Transport in bulk according to Annex II of MARPOL 73/78 and

No information available.

the IBC Code

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Antimony (CAS 7440-36-0) LISTED
Copper (CAS 7440-50-8) LISTED
Lead (CAS 7439-92-1) LISTED
Nickel (CAS 7440-02-0) LISTED
Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

No

Hazard categories Immediate Hazard - Yes

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

SARA 302 Extremely

hazardous substance

SARA 311/312 Hazardous Yes

chemical

Other federal regulations

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

Antimony (CAS 7440-36-0) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Joue Hullibe

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

US state regulations WARNING: This product may contain chemicals known to the State of California to cause cancer

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Antimony (CAS 7440-36-0) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

Antimony (CAS 7440-36-0) 500 LBS

Leaded Tin Bronze Alloys SDS #103 Version: 1.0

7 / 8 Issue date: June 01, 2015

 Copper (CAS 7440-50-8)
 500 LBS

 Lead (CAS 7439-92-1)
 500 LBS

 Nickel (CAS 7440-02-0)
 500 LBS

 Zinc (CAS 7440-66-6)
 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Antimony (CAS 7440-36-0) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Antimony (CAS 7440-36-0) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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)

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

References 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

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

Leaded Tin Bronze Alloys SDS #103 Version: 1.0

: 1.0 Issue date: June 01, 2015



SAFETY DATA SHEET

1. Identification

Product identifier High Lead Tin Bronze Alloys

Other means of identification

SDS number 104

Product code C93900, C94000, C94100, C94300, C94310, C94400, C94500

Recommended use Manufacturing **Recommended restrictions** Not assigned.

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone 330-948-1231 **Contact person** Tim I amb E-mail

timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards 1Not classified.

Health hazards Acute toxicity, oral Category 4

> Acute toxicity, inhalation Category 4 Sensitization, skin Category 1 Carcinogenicity Category 2 Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated Category 2

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word

Hazard statement Harmful if swallowed. Harmful if inhaled. May cause an allergic skin reaction. May cause damage

to organs (Lung, central nervous system) through prolonged or repeated exposure. Suspected of

causing cancer. May damage fertility or the unborn child. Very toxic to aquatic life.

Precautionary statement

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not

> breathe fumes and dusts. Use only outdoors or in a well-ventilated area. Obtain special instructions before use. Do not handle until all safety precautions have been read and

understood. Use personal protective equipment as required. Contaminated work clothing should

not be allowed out of the workplace.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Specific treatment (see this label). Wash contaminated clothing before reuse. If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. If swallowed: Immediately call a poison center/doctor. If swallowed: Rinse mouth. Do not induce vomiting. If inhaled: Remove person to fresh air and keep comfortable for breathing.

Storage Store locked up.

Disposal Dispose of contents/container to a facility that has permission of disposing the industrial waste.

Hazard(s) not otherwise

classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 1

acute hazard

ENG High Lead Tin Bronze Alloys SDS #104 Version: 1.0 Issue date: June 01, 2015

1/8

3. Composition/information on ingredients

Mixture

Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	68.5-89
Lead		7439-92-1	22-32
Tin		7440-31-5	4.5-6
Nickel		7440-02-0	0-6
Zinc		7440-66-6	0-2.5

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation
Skin contact

Eye contact

In case of exposure to fumes or particulates: Get medical attention immediately.

of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions

should be treated promptly with thorough cleansing of the affected area.

gastro-intestinal or central nervous system disturbances and anemia.

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any contact lenses and open eyelids wide apart.

Ingestion Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

personnel. Get medical attention if any discomfort continues.

Most important symptoms/effects, acute and

delayed

Indication of immediate medical attention and special treatment needed

Treat symptomatically. Symptoms may be delayed.

General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal: Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions

Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions Avoid release to the environment. Do not contaminate water.

High Lead Tin Bronze Alloys SDS #104 Version: 1.0

ENG

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for Ai	r Contaminants (29 CFR 1910.1	000)	
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit Value	es		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
US. NIOSH: Pocket Guide to Che	mical Hazards		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	
ogical limit values			

Bio

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

High Lead Tin Bronze Allovs 3/8 SDS #104 Version: 1.0 Issue date: June 01, 2015

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

> with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene

Always observe good personal hygiene measures, such as washing after handling the material considerations and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available. Not available. pН Melting point/freezing point 1724 °F (940 °C) Initial boiling point and boiling Not available.

range

Not available. Flash point **Evaporation rate** Not available. Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

Flammability limit - upper

(%)

Not available.

Not available. Explosive limit - lower (%) Explosive limit - upper (%) Not available. Vapor pressure Not available. Not available. Vapor density

7.5 - 9Relative density

Insoluble in water. Solubility(ies) Partition coefficient Not available.

(n-octanol/water)

Not available. **Auto-ignition temperature** Not available. **Decomposition temperature** Not available. Viscosity

Other information

0.27 - 0.323 lb/in3 **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Issue date: June 01, 2015

Contact with incompatible materials. Contact with acids will release flammable hydrogen gas. Conditions to avoid

Avoid dust formation. Dust clouds may be explosive under certain conditions.

ENG 4/8 Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Not relevant, due to the form of the product. However, ingestion of dusts generated during Ingestion

working operations may cause nausea and vomiting. Harmful if swallowed.

Inhalation Harmful by inhalation. May cause respiratory tract irritation. Elevated temperatures or mechanical

action may form dust and fumes which may be irritating to the mucous membranes and

respiratory tract.

May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers Skin contact

allergic to nickel may develop eczema or rashes. Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like

attack, with wheezing, bronchospasm, and dyspnea.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing. Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

Acute toxicity High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

burns.

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization Not classified.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Possible cancer hazard - may cause cancer based on animal data. Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead

exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Specific target organ toxicity -

single exposure

Not available.

Specific target organ toxicity -

repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central

nervous system.

Aspiration hazard Not available.

Chronic effects Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead

to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information Lead is accumulated in the body and may cause damage to the brain and nervous system after

prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects.

FNG High Lead Tin Bronze Alloys SDS #104 Version: 1.0

5/8 Issue date: June 01, 2015

Components **Species Test Results**

Lead (CAS 7439-92-1)

Rainbow trout, donaldson trout LC50

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential The product contains potentially bioaccumulating substances. Mobility in soil Alloys in massive forms are not mobile in the environment. Mobility in general Alloys in massive forms are not mobile in the environment.

Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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.

1.17 mg/l, 96 Hours

Contaminated packaging Not applicable.

14. Transport information

DOT

UN3077 **UN** number

UN proper shipping name Environmentally hazardous substances, solid, n.o.s. (Lead RQ = 42 LBS)

Transport hazard class(es)

Subsidary class(es) Not available.

Packing group

Special precautions for user Not available.

Labels required 9

8, 146, B54, IB8, IP3, N20, T1, TP33 Special provisions

Packaging exceptions 155 Packaging non bulk 213 Packaging bulk 240

IATA

UN3077 **UN number**

Environmentally hazardous substance, solid, n.o.s. (Lead) **UN proper shipping name**

Transport hazard class(es) Subsidary class(es) Ш Packaging group 9 Labels required 91 **FRG Code**

Special precautions for user Not available.

IMDG

UN3077 **UN** number

UN proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead), MARINE

POLLUTANT

Transport hazard class(es) 9 Subsidary class(es) **Packaging group** Ш **Environmental hazards**

Yes Marine pollutant Labels required F-A, S-F **EmS** Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and No information available.

the IBC Code

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

ENG High Lead Tin Bronze Alloys 6/8

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

29 CFR 1910.1025 Lead (CAS 7439-92-1)

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED Nickel (CAS 7440-02-0) LISTED Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

> Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No

SARA 302 Extremely No

hazardous substance SARA 311/312 Hazardous

Yes

chemical

Other federal regulations

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

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

US state regulations WARNING: This product contains a chemical known to the State of California to cause cancer

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

500 LBS Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) 500 LBS Zinc (CAS 7440-66-6) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

ENG High Lead Tin Bronze Alloys 7/8 SDS #104 Version: 1.0

Issue date: June 01, 2015

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)

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

References 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 The information in this MSDS was obtained from industry sources that we believe to be reliable.

However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of

the product.

High Lead Tin Bronze Alloys **ENG** 8/8 SDS #104 Version: 1.0 Issue date: June 01, 2015



SAFETY DATA SHEET

1. Identification

Product identifier Manganese Bronze Alloys

Other means of identification

105 SDS number

C86100, C86200, C86300, C86400, C86500, C86700 **Product code**

Recommended use Manufacturing Recommended restrictions Not assigned.

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Corporate: 1668 Frost Rd., Streetsboro, OH 44241 **Address**

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Sensitization, skin Category 1

> Carcinogenicity Category 2 Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated Category 2 (Lung, central nervous system)

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word

Hazard statement May cause an allergic skin reaction. May cause damage to organs (Lung, central nervous

system) through prolonged or repeated exposure. Suspected of causing cancer. May damage

fertility or the unborn child.

Precautionary statement

Prevention Do not breathe fumes and dusts. Obtain special instructions before use. Do not handle until all

safety precautions have been read and understood. Use personal protective equipment as

required. Contaminated work clothing should not be allowed out of the workplace.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical

advice/attention. Get medical advice/attention if you feel unwell.

Storage Store locked up.

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

Hazard(s) not otherwise classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 3

long-term hazard

3. Composition/information on ingredients

Mixture

Manganese Bronze Alloys 1/8

SDS #105 Version: 1.0 Issue date: June 01, 2015

Hazardous components Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	54-66
Zinc		7440-66-6	22-42
Manganese		7439-96-5	0.1-15
Aluminum		7429-90-5	0.5-7.5
Nickel		7440-02-0	0-6
Lead		7439-92-1	0-2.0
Tin		7440-31-5	0-1.5

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation Skin contact

In case of exposure to fumes or particulates: Get medical attention immediately.

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness

contact lenses and open eyelids wide apart.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

Most important symptoms/effects, acute and delayed

gastro-intestinal or central nervous system disturbances and anemia. Treat symptomatically. Symptoms may be delayed.

Indication of immediate medical attention and special treatment needed

General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Unsuitable extinguishing

Special powder against metal fires. Dry sand.

media

Do not use water or halogenated extinguishing media. Do not use water on molten metal: Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

ENG Manganese Bronze Alloys 2/8 SDS #105 Version: 1.0 Issue date: June 01, 2015

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occ

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for Air	Contaminants (29 CFR 1910.1	000)	
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total dust.
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit Values	3		
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	

Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	REL	5 mg/m3	Welding fume or pyrophoric powder.
		5 mg/m3	Respirable.
		10 mg/m3	Total
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Manganese (CAS 7439-96-5)	REL	1 mg/m3	Fume.
,	STEL	3 mg/m3	Fume.
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	

Biological limit values

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time	
Lead (CAS 7439-92-1)	300 μg/l	Lead	*	
* - For sampling details, please see the source document.				

Exposure guidelines Follow standard monitoring procedures.

ENG Manganese Bronze Alloys 3/8 SDS #105 Version: 1.0 Issue date: June 01, 2015

Appropriate engineering

controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

Skin protection

Hand protection

Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available. Unknown. pН

1616 - 1725.8 °F (880 - 941 °C) Melting point/freezing point

Initial boiling point and boiling

range

Not available.

Not available. Flash point **Evaporation rate** Not available. Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

(%)

Flammability limit - upper

(%)

Not available.

Not available. Explosive limit - lower (%) Not available. Explosive limit - upper (%) Vapor pressure Not available. Vapor density Not available.

7.5 - 9Relative density

Solubility(ies) Insoluble in water. Not available. **Partition coefficient**

(n-octanol/water)

Not available. **Auto-ignition temperature** Not available. **Decomposition temperature Viscosity** Not available.

Manganese Bronze Alloys SDS #105 Version: 1.0

Other information

0.27 - 0.323 lb/in3 (20°C/68°F) **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting.

May cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust Inhalation

and fumes which may be irritating to the mucous membranes and respiratory tract.

May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers Skin contact

allergic to nickel may develop eczema or rashes.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of Acute toxicity

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization Not classified.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data.

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead

exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Specific target organ toxicity -

single exposure

Not available.

Specific target organ toxicity -

repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central

nervous system.

Aspiration hazard Not available

Manganese Bronze Alloys **ENG** 5/8 SDS #105 Version: 1.0

Chronic effects Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause

metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information Lead is accumulated in the body and may cause damage to the brain and nervous system after

prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Components **Species Test Results**

Lead (CAS 7439-92-1)

LC50 1.17 mg/l, 96 Hours Rainbow trout, donaldson trout

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential The product contains potentially bioaccumulating substances. Mobility in soil Alloys in massive forms are not mobile in the environment. Mobility in general Alloys in massive forms are not mobile in the environment.

Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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 Not applicable.

14. Transport information

DOT

Not regulated as a hazardous material by DOT.

IATA

Not regulated as a dangerous good.

IMDG

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No information available.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED LISTED Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) LISTED Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

> Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - Yes

SARA 302 Extremely hazardous substance

Manganese Bronze Alloys **ENG** 6/8 SDS #105 Version: 1.0 Issue date: June 01, 2015

SARA 311/312 Hazardous Yes

chemical

Other federal regulations

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

Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug

Not regulated.

Administration (FDA)

US state regulations

WARNING: This product contains chemicals known to the State of California to cause cancer

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Aluminum (CAS 7429-90-5) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

Aluminum (CAS 7429-90-5) 500 LBS Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) 500 LBS Manganese (CAS 7439-96-5) 500 LBS Nickel (CAS 7440-02-0) 500 LBS Zinc (CAS 7440-66-6) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Aluminum (CAS 7429-90-5) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Aluminum (CAS 7429-90-5) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

ENG Manganese Bronze Alloys 7/8 SDS #105 Version: 1.0

Country(s) or region Inventory name On inventory (yes/no)* European Inventory of Existing Commercial Chemical Europe Substances (EINECS) Europe European List of Notified Chemical Substances (ELINCS) No Inventory of Existing and New Chemical Substances (ENCS) Japan No Korea Existing Chemicals List (ECL) Yes New Zealand New Zealand Inventory Yes Philippine Inventory of Chemicals and Chemical Substances **Philippines** Yes (PICCS)

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)

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

References 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 The information in this MSDS was obtained from industry sources that we believe to be reliable.

However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of

the product.

Manganese Bronze Alloys **ENG** 8/8 SDS #105 Version: 1.0 Issue date: June 01, 2015



SAFETY DATA SHEET

1. Identification

Product identifier Yellow Brass Alloys

Other means of identification

106 SDS number

C85200, C85300, C85400, C85500, C85700, C85800, C36000 **Product code**

Recommended use Manufacturing Recommended restrictions Not assigned.

Manufacturer / Importer / Supplier / Distributor information Spectrum Machine, Inc. Company name

Corporate: 1668 Frost Rd., Streetsboro, OH 44241 **Address**

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Sensitization, skin Category 1

Carcinogenicity Category 2 Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated Category 2 (Lung, central nervous system)

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word

Hazard statement May cause an allergic skin reaction. May cause damage to organs (Lung, central nervous

system) through prolonged or repeated exposure. Suspected of causing cancer. May damage

fertility or the unborn child.

Precautionary statement

Prevention Do not breathe fumes and dusts. Obtain special instructions before use. Do not handle until all

safety precautions have been read and understood. Use personal protective equipment as

required. Contaminated work clothing should not be allowed out of the workplace.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical

advice/attention. Get medical advice/attention if you feel unwell.

Storage Store locked up.

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

Hazard(s) not otherwise classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 3

long-term hazard

3. Composition/information on ingredients

Mixture

ENG Yellow Brass Alloys SDS #106 Version: 1.0 1/8 Issue date: June 01, 2015

Hazardous components Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	58-64
Zinc		7440-66-6	32-41
Lead		7439-92-1	0.8-1.5
Tin		7440-31-5	0.5-1.5
Nickel		7440-02-0	0-1

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation Skin contact In case of exposure to fumes or particulates: Get medical attention immediately.

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any

contact lenses and open eyelids wide apart.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

personnel. Get medical attention if any discomfort continues.

Most important

General information

symptoms/effects, acute and

delayed

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

gastro-intestinal or central nervous system disturbances and anemia.

Indication of immediate medical attention and special

treatment needed

Treat symptomatically. Symptoms may be delayed.

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Unsuitable extinguishing

media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal: Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

Yellow Brass Alloys **ENG** SDS #106 Version: 1.0 2/8

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for Ai	r Contaminants (29 CFR 1910.1	000)	
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit Value	es		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
US. NIOSH: Pocket Guide to Che	mical Hazards		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	
ogical limit values			
US. ACGIH. BEIs. Biological Expo	osure Indices		

Bio

S. ACGIH. BEIS. Biological Exposure indices

Components	Value	Determinant	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

ENG Yellow Brass Allovs SDS #106 Version: 1.0 Issue date: June 01, 2015

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Tubes, Solids & Turnings.

Physical state Solid.

Form Tubes, Solids & Turnings.

Color Yellow. Odor None.

Odor threshold Not available. Not available. pН Melting point/freezing point 1725.8 °F (941 °C)

Initial boiling point and boiling

range

Not available.

Not available. Flash point Not available. **Evaporation rate** Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

Flammability limit - upper

(%)

Vapor density

Not available.

Not available. Explosive limit - lower (%) Explosive limit - upper (%) Not available. Vapor pressure Not available.

8.5 Relative density

Insoluble in water. Solubility(ies) Partition coefficient

(n-octanol/water)

Not available.

Not available.

Not available. **Auto-ignition temperature** Not available. **Decomposition temperature** Not available Viscosity

Other information

0.304 lb/in3 **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

ENG Yellow Brass Allovs SDS #106 Version: 1.0 4/8 Issue date: June 01, 2015

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Not relevant, due to the form of the product. However, ingestion of dusts generated during Ingestion

working operations may cause nausea and vomiting.

Inhalation May cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust

and fumes which may be irritating to the mucous membranes and respiratory tract.

May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers Skin contact

allergic to nickel may develop eczema or rashes.

Molten material will produce thermal burns. Elevated temperatures or mechanical action may form Eye contact

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of Acute toxicity

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Not classified. Respiratory sensitization

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Possible cancer hazard - may cause cancer based on animal data. Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead

> exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Specific target organ toxicity single exposure

Not available.

Specific target organ toxicity -

repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central

nervous system.

Aspiration hazard Not available.

Chronic effects Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead

to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information Lead is accumulated in the body and may cause damage to the brain and nervous system after

prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Yellow Brass Alloys **ENG** SDS #106 Version: 1.0 5/8 Components **Species Test Results**

Lead (CAS 7439-92-1)

LC50 Rainbow trout, donaldson trout

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential The product contains potentially bioaccumulating substances. Mobility in soil Alloys in massive forms are not mobile in the environment. Mobility in general Alloys in massive forms are not mobile in the environment.

Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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.

1.17 mg/l, 96 Hours

Contaminated packaging Not applicable.

14. Transport information

Not regulated as a hazardous material by DOT.

IATA

Not regulated as a dangerous good.

IMDG

the IBC Code

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and No information available.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED Nickel (CAS 7440-02-0) LISTED Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

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

SARA 302 Extremely Nο

hazardous substance

SARA 311/312 Hazardous

Yes

chemical

Other federal regulations

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

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

ENG Yellow Brass Allovs SDS #106 Version: 1.0 6/8

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

WARNING: This product contains chemicals known to the State of California to cause cancer **US** state regulations

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) 500 LBS 500 LBS Nickel (CAS 7440-02-0) Zinc (CAS 7440-66-6) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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 co	omplies with the inventory requirements administered by the governing country(s)	

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

Yellow Brass Alloys SDS #106 Version: 1.0 7/8 Issue date: June 01, 2015

References

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

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

Yellow Brass Alloys ENG 8/8

SDS #106 Version: 1.0 Issue date: June 01, 2015



SAFETY DATA SHEET

1. Identification

Product identifier Red Brass Alloys

Other means of identification

SDS number 107

Product code C83600, C83800, C84400, C84500, C84800, Red Brass

Recommended use Manufacturing **Recommended restrictions** Not assigned.

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards

Health hazards Sensitization, skin Category 1

Not classified.

Carcinogenicity Category 2 Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated Category 2 (Lung, central nervous system)

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word Danger

Hazard statement May cause an allergic skin reaction. May cause damage to organs (Lung, central nervous

system) through prolonged or repeated exposure. Suspected of causing cancer. May damage

fertility or the unborn child.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read

and understood. Use personal protective equipment as required. Contaminated work clothing

should not be allowed out of the workplace. Do not breathe dust/fume.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical

advice/attention. Get medical advice/attention if you feel unwell.

Storage Store locked up.

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

Hazard(s) not otherwise classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 2

long-term hazard

3. Composition/information on ingredients

Mixture

1/8 Issue date: June 01, 2015

SDS #107 Version: 1.0

Red Brass Alloys

Hazardous components Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	78-86
Zinc		7440-66-6	4-16
Lead		7439-92-1	4-8
Tin		7440-31-5	2.3-6
Nickel		7440-02-0	0-1

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation Skin contact In case of exposure to fumes or particulates: Get medical attention immediately.

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions

should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness

contact lenses and open eyelids wide apart.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

Most important symptoms/effects, acute and delayed

of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are gastro-intestinal or central nervous system disturbances and anemia.

Indication of immediate medical attention and special

Treat symptomatically. Symptoms may be delayed.

treatment needed General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Special powder against metal fires. Dry sand.

Unsuitable extinguishing media

Do not use water or halogenated extinguishing media. Do not use water on molten metal: Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

ENG Red Brass Alloys Issue date: June 01, 2015

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for Air	Contaminants (29 CFR 1910.	1000)	
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit Value	s		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
US. NIOSH: Pocket Guide to Cher	nical Hazards		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	
ogical limit values			

Bio

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles, during sawing, grinding, or machining.

Red Brass Alloys SDS #107 Version: 1.0 3/8

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available. Not available. pН Melting point/freezing point 1841 °F (1005 °C)

Initial boiling point and boiling

range

Not available.

Not available. Flash point **Evaporation rate** Not available. Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

Flammability limit - upper

(%)

Not available.

Not available. Explosive limit - lower (%) Explosive limit - upper (%) Not available. Vapor pressure Not available. Not available. Vapor density

Relative density 8.7

Insoluble in water. Solubility(ies) Partition coefficient Not available.

(n-octanol/water)

Not available. **Auto-ignition temperature** Not available. **Decomposition temperature** Not available. Viscosity

Other information

314 lb/in3 (20°C/68°F) **Bulk density**

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Issue date: June 01, 2015

Contact with incompatible materials. Contact with acids will release flammable hydrogen gas. Conditions to avoid

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Red Brass Alloys SDS #107 Version: 1.0 **Incompatible materials** Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting.

Inhalation May cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust

and fumes which may be irritating to the mucous membranes and respiratory tract.

Skin contact May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers

allergic to nickel may develop eczema or rashes.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics

May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

Acute toxicity High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

burns.

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization Not classified.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data.

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity

Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead

exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Issue date: June 01, 2015

Specific target organ toxicity - single exposure

Not available.

Specific target organ toxicity -

repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central

nervous system.

Aspiration hazard Not available.

Chronic effects Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead

to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information Lead is accumulated in the body and may cause damage to the brain and nervous system after

prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

Red Brass Alloys

Components **Species Test Results**

Lead (CAS 7439-92-1)

Rainbow trout, donaldson trout LC50

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential The product contains potentially bioaccumulating substances. Mobility in soil Alloys in massive forms are not mobile in the environment. Mobility in general Alloys in massive forms are not mobile in the environment.

Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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.

1.17 mg/l, 96 Hours

Contaminated packaging Not applicable.

14. Transport information

DOT

UN3077 **UN** number

UN proper shipping name Environmentally hazardous substances, solid, n.o.s. (Lead RQ = 140 LBS)

Transport hazard class(es)

Subsidary class(es) Not available.

Packing group

Special precautions for user Not available.

Labels required

8, 146, B54, IB8, IP3, N20, T1, TP33 Special provisions

Packaging exceptions 155 Packaging non bulk 213 Packaging bulk 240

IATA

UN3077 **UN number**

Environmentally hazardous substance, solid, n.o.s. (Lead) **UN proper shipping name**

Transport hazard class(es) Subsidary class(es) Ш Packaging group 9 Labels required 91 **FRG Code**

Special precautions for user Not available.

IMDG

UN3077 **UN** number

UN proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead), MARINE

POLLUTANT

Transport hazard class(es) 9 Subsidary class(es) **Packaging group** Ш **Environmental hazards**

Yes Marine pollutant Labels required F-A, S-F **EmS** Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and No information available.

the IBC Code

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

Red Brass Alloys ENG SDS #107 Version: 1.0

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED Nickel (CAS 7440-02-0) LISTED Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

> Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - Yes

SARA 302 Extremely No

hazardous substance

SARA 311/312 Hazardous

chemical

Yes

Other federal regulations

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

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug

Not regulated.

Administration (FDA) **US** state regulations

WARNING: This product contains chemicals known to the State of California to cause cancer

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

500 LBS Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) 500 LBS Zinc (CAS 7440-66-6) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

SDS #107 Version: 1.0 Issue date: June 01, 2015

Red Brass Alloys

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)

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

References 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 The information in this MSDS was obtained from industry sources that we believe to be reliable.

However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of

the product.

Red Brass Alloys

Issue date: June 01, 2015

SDS #107 Version: 1.0



SAFETY DATA SHEET

1. Identification

Product identifier Nickel Silver Alloys

Other means of identification

SDS number 108

Product code C97300, Nickel-Silver

Recommended use Manufacturing **Recommended restrictions** Not assigned.

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail

timlamb@spectrummachine.com **Emergency phone number** 1-888-276-6937

2. Hazard(s) identification

Not classified. **Physical hazards**

Acute toxicity, oral Category 4 **Health hazards**

> Acute toxicity, inhalation Category 4 Sensitization, skin Category 1 Carcinogenicity Category 2 Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated

exposure

Category 1 (Lung, central nervous system)

Not classified. OSHA hazard(s)

Label elements

Hazard symbol



Signal word

Hazard statement Harmful if swallowed. Harmful if inhaled. May cause an allergic skin reaction. Causes damage to

organs (Lung, central nervous system) through prolonged or repeated exposure. Suspected of

causing cancer. May damage fertility or the unborn child.

Precautionary statement

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not

> breathe fumes and dusts. Use only outdoors or in a well-ventilated area. Obtain special instructions before use. Do not handle until all safety precautions have been read and

understood. Use personal protective equipment as required. Contaminated work clothing should

not be allowed out of the workplace.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. If swallowed: Rinse mouth. If

inhaled: Remove person to fresh air and keep comfortable for breathing.

Storage Store locked up.

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

Hazard(s) not otherwise classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 2

long-term hazard

Nickel Silver Alloys **ENG** 1/8 SDS #108 Version: 1.0 Issue date: June 01, 2015

3. Composition/information on ingredients

Mixture

Hazardous components			
Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	53-87
Nickel		7440-02-0	9-33
Zinc		7440-66-6	0-25
Lead		7439-92-1	0-11
Tin		7440-31-5	0-5.5
Manganese		7439-96-5	0-1.5

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation

In case of exposure to fumes or particulates: Get medical attention immediately.

Skin contact

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness

contact lenses and open eyelids wide apart.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

personnel. Get medical attention if any discomfort continues.

gastro-intestinal or central nervous system disturbances and anemia.

Most important

symptoms/effects, acute and delayed

Indication of immediate medical attention and special

Treat symptomatically. Symptoms may be delayed.

treatment needed

General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing media

Specific hazards arising from the chemical

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal:

Explosion hazard could result.

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

FNG Nickel Silver Alloys 2/8 SDS #108 Version: 1.0 Issue date: June 01, 2015

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

5 mg/m3

1 mg/m3

2 mg/m3

Fume

3/8

Conditions for safe storage, including any incompatibilities

Keep dry. Store away from incompatible materials.

Ceiling

PEL

PEL

8. Exposure controls/personal protection

Occupational exposure limits

Manganese (CAS

Nickel (CAS 7440-02-0)

Tin (CAS 7440-31-5)

7439-96-5)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for A	ir Contaminants (29 CFR 1910.	1000)	
Components	Туре	Value	Form
Components Copper (CAS 7440-50-8)	Type PEL	Value 1 mg/m3	Form Dust and mist.

US. ACGIH	Threshold	Limit	Values

Components	Туре	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)	TWA	2 mg/m3	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Туре	Value	Form
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Lead (CAS 7439-92-1)	REL	0.05 mg/m3	
Manganese (CAS 7439-96-5)	REL	1 mg/m3	Fume.
	STEL	3 mg/m3	Fume.
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	

Biological limit values

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines

Follow standard monitoring procedures.

Appropriate engineering controls

SDS #108 Version: 1.0

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Nickel Silver Alloys ENG

Individual protection measures, such as personal protective equipment

Eye/face protection Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety

glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles,

during sawing, grinding, or machining.

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

> with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept

separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Arcs, Solids, Rectangles, Tubes & Turnings.

Physical state Solid.

Form Arcs, Solids, Rectangles, Tubes & Turnings.

Color Silver to Yellow.

Odor None

Odor threshold Not available. pН Not available.

1850 - 1904 °F (1010 - 1040 °C) Melting point/freezing point

Initial boiling point and boiling

range

Not available.

Flash point Not available. Not available. **Evaporation rate** Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

(%)

Not available.

Flammability limit - upper

Not available.

Explosive limit - lower (%) Not available. Explosive limit - upper (%) Not available. Vapor pressure Not available. Vapor density Not available.

8 95 Relative density

Solubility(ies) Insoluble in water. **Partition coefficient** Not available.

(n-octanol/water)

Not available. **Auto-ignition temperature** Not available. **Decomposition temperature Viscosity** Not available.

Other information

Bulk density 0.321 lb/in3 (20°C/68°F)

10. Stability and reactivity

Reactivity Stable at normal conditions.

Nickel Silver Alloys **ENG** 4/8 SDS #108 Version: 1.0

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting. Harmful if swallowed.

Inhalation Harmful by inhalation. May cause respiratory tract irritation. Elevated temperatures or mechanical

action may form dust and fumes which may be irritating to the mucous membranes and

respiratory tract.

Skin contact May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers

allergic to nickel may develop eczema or rashes. Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like

attack, with wheezing, bronchospasm, and dyspnea.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics

May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

Acute toxicity High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

burns.

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization Not classified.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data.

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead

exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during

pregnancy may cause birth defects.

Specific target organ toxicity - single exposure

Not available.

Specific target organ toxicity - repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central nervous system.

blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Aspiration hazard Not available.

Chronic effects

Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to

Nickel Silver Alloys

ENG
SDS #108 Version: 1.0

5 / 8

SDS #108 Version: 1.0 Issue date: June 01, 2015

Lead is accumulated in the body and may cause damage to the brain and nervous system after prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects.

Components **Test Results Species** Lead (CAS 7439-92-1) LC50 Rainbow trout, donaldson trout 1.17 mg/l, 96 Hours (Oncorhynhus mykiss) Persistence and degradability The product is not biodegradable. **Bioaccumulative potential** The product contains potentially bioaccumulating substances. Mobility in soil Alloys in massive forms are not mobile in the environment. Mobility in general Alloys in massive forms are not mobile in the environment. Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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 Not applicable.

14. Transport information

DOT

UN3077 **UN number**

UN proper shipping name Environmentally hazardous substances, solid, n.o.s. (Lead RQ = 134 LBS)

Transport hazard class(es) 9

Subsidary class(es) Not available.

Packing group

Special precautions for user Not available.

9 Labels required

Special provisions 8, 146, B54, IB8, IP3, N20, T1, TP33

Packaging exceptions 155 213 Packaging non bulk 240 Packaging bulk

IATA

UN3077 UN number

Environmentally hazardous substance, solid, n.o.s. (Lead) **UN proper shipping name**

Transport hazard class(es) 9 Subsidary class(es) **Packaging group** Ш 9 Labels required 9L **ERG Code**

Special precautions for user Not available.

IMDG

UN3077 **UN** number

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead), MARINE **UN proper shipping name**

POLLUTANT

Transport hazard class(es) 9 Subsidary class(es) Ш Packaging group **Environmental hazards**

Yes Marine pollutant a Labels required F-A, S-F Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and

No information available.

the IBC Code

Nickel Silver Alloys 6/8 SDS #108 Version: 1.0 Issue date: June 01, 2015

ENG

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED Manganese (CAS 7439-96-5) LISTED Nickel (CAS 7440-02-0) LISTED Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

> Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No

SARA 302 Extremely

hazardous substance

SARA 311/312 Hazardous

Yes

chemical

Other federal regulations

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

Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug

Not regulated.

Administration (FDA)

US state regulations WARNING: This product may contain chemicals known to the State of California to cause cancer

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) 500 LBS Manganese (CAS 7439-96-5) 500 LBS 500 LBS Nickel (CAS 7440-02-0) 500 LBS Zinc (CAS 7440-66-6)

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

Nickel Silver Alloys 7/8 SDS #108 Version: 1.0

US. Rhode Island RTK

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
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)

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

Further information Not available.

References 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 The information in this MSDS was obtained from industry sources that we believe to be reliable.

However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of

the product.

ENG Nickel Silver Alloys 8/8 SDS #108 Version: 1.0



SAFETY DATA SHEET

1. Identification

Product identifier Copper Aluminum Alloys

Other means of identification

SDS number 109

Product code C61400, C61900, C62300, C62400, C62500, C63000, C63200, C63600, C63700, C64200

Recommended use Manufacturing **Recommended restrictions** Not assigned.

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Sensitization, respiratory Category 1

> Sensitization, skin Category 1 Category 2 Carcinogenicity Reproductive toxicity (fertility, the unborn Category 1A

child)

Specific target organ toxicity, repeated Category 2 (Lung, central nervous system)

exposure

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word Danger

Hazard statement May cause an allergic skin reaction. May cause damage to organs (Lung, central nervous

> system) through prolonged or repeated exposure. Suspected of causing cancer. May damage fertility or the unborn child. May cause allergy or asthma symptoms or breathing difficulties if

inhaled.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read

and understood. Use personal protective equipment as required. Contaminated work clothing should not be allowed out of the workplace. Do not breathe dust/fume. Wear respiratory

protection.

Response If on skin: Wash with plenty of soap and water. If inhaled: If breathing is difficult, remove person to

fresh air and keep comfortable for breathing. If skin irritation or rash occurs: Get medical

advice/attention. Wash contaminated clothing before reuse. If exposed or concerned: Get medical

advice/attention. Get medical advice/attention if you feel unwell.

Storage Store locked up.

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

Hazard(s) not otherwise

classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, Category 2

long-term hazard

Copper Aluminum Alloys SDS #109 Version: 1.0 1/9 Issue date: June 01, 2015

ENG

3. Composition/information on ingredients

Mixture

Hazardous components Chemical name	Common name and synonyms	CAS number	%
Copper	Synonyms	7440-50-8	58-94.5
Aluminum		7429-90-5	0.25-16
Nickel		7440-02-0	0-5.5
Manganese		7439-96-5	0.3-3.5
Lead		7439-92-1	0-3.0
Cobalt		7440-48-4	0-2.5
Silicon		7440-21-3	0-1.5

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation

In case of exposure to fumes or particulates: Get medical attention immediately.

Skin contact

Contact with dust: Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing. In case of allergic reaction or other skin disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove any

contact lenses and open eyelids wide apart.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

personnel. Get medical attention if any discomfort continues.

Most important symptoms/effects, acute and

delayed

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness of breath. Wheezing. Sensitization. The principal symptoms of lead poisoning are

gastro-intestinal or central nervous system disturbances and anemia.

Indication of immediate medical attention and special treatment needed

General information

Treat symptomatically. Symptoms may be delayed.

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing

media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal:

Explosion hazard could result.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting

equipment/instructions

Move containers from fire area if you can do it without risk.

form nickel carbonyl, a highly toxic substance and known carcinogen.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Copper Aluminum Alloys **ENG** SDS #109 Version: 1.0 2/9 Avoid release to the environment. Do not contaminate water.

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid generation and spreading of dust and fumes. Avoid inhalation of dust and contact with skin and eyes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Value

Conditions for safe storage, including any incompatibilities Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

Components

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Type

Components	Туре	Value	
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
US. OSHA Table Z-1 Limits for Air	Contaminants (29 CFR 1910.1	000)	
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total dust.
Cobalt (CAS 7440-48-4)	PEL	0.1 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
		0.1 mg/m3	Fume.
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Silicon (CAS 7440-21-3)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
US. ACGIH Threshold Limit Values	S		
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Cobalt (CAS 7440-48-4)	TWA	0.02 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m3	
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
JS. NIOSH: Pocket Guide to Chem	nical Hazards		
Components	Туре	Value	Form
Aluminum (CAS 7429-90-5)	REL	5 mg/m3	Welding fume or pyrophoric powder.
		5 mg/m3	Respirable.
		10 mg/m3	Total
Cobalt (CAS 7440-48-4)	REL	0.05 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
_ead (CAS 7439-92-1)	REL	0.05 mg/m3	
Manganese (CAS 7439-96-5)	REL	1 mg/m3	Fume.
•	STEL	3 mg/m3	Fume.
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Silicon (CAS 7440-21-3)	REL	5 mg/m3	Respirable.
01110011 (0/10 / 440 21 0)			

Copper Aluminum Alloys **ENG** Issue date: June 01, 2015

SDS #109 Version: 1.0

US. ACGIH. BEIs. Biological Exposure Indices

Components	Value	Determinant	Sampling Time
Cobalt (CAS 7440-48-4)	1 μg/l	Cobalt	*
Lead (CAS 7439-92-1)	300 μg/l	Lead	*

^{* -} For sampling details, please see the source document.

Exposure guidelines Follow standard monitoring procedures.

Appropriate engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Ventilate as needed to control airborne dust. Use explosion-proof ventilation equipment if airborne dust levels are high. Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing etc., in order to eliminate explosion hazards. Follow the schedule for work place measurements when working with lead and its compounds.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear dust-resistant safety goggles where there is danger of eye contact. In addition to safety

> glasses or goggles, a welding helmet with appropriate shaded shield is required during welding, burning, or brazing. A face shield is recommended, in addition to safety glasses or goggles,

during sawing, grinding, or machining.

Skin protection

Hand protection Wear suitable protective gloves to prevent cuts and abrasions. When material is heated, wear

gloves to protect against thermal burns. Suitable gloves can be recommended by the glove

supplier.

Other Wear suitable protective clothing.

Respiratory protection In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment

with particle filter. When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH approved respirator for dusts. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use. Seek advice from local supervisor.

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. Private clothes and working clothes should be kept separately. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow Odor None **Odor threshold** Not available.

pН Not available. Melting point/freezing point Not available. Initial boiling point and boiling Not available.

range

(%)

Not available. Flash point Not available. **Evaporation rate** Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower Not available.

Flammability limit - upper

Copper Aluminum Alloys

Not available.

Explosive limit - lower (%) Not available.

Not available. Explosive limit - upper (%) Vapor pressure Not available. Vapor density Not available.

Not available. Relative density

SDS #109 Version: 1.0 4/9 Issue date: June 01, 2015

Solubility(ies) Insoluble in water.

Partition coefficient Not available.

(n-octanol/water)

Auto-ignition temperatureNot available.Decomposition temperatureNot available.ViscosityNot available.

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoidContact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting.

Inhalation May cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust

and fumes which may be irritating to the mucous membranes and respiratory tract. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm, and dyspnea.

Skin contact May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers

allergic to nickel may develop eczema or rashes. Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like

attack, with wheezing, bronchospasm, and dyspnea.

Eye contact

Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye. Acute exposure to cobalt metal, dust, and fume

may cause irritation of skin and eyes.

Symptoms related to the physical, chemical and toxicological characteristics

May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia. Sensitization.

Information on toxicological effects

Acute toxicity Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In

sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm, and dyspnea. Ingestion of cobalt may cause nausea, vomiting, diarrhea, and a sensation of hotness. High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and

eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing,

bronchospasm, and dyspnea.

Components Species Test Results

Silicon (CAS 7440-21-3)

Acute Oral

LD50 Rat

3150 mg/kg

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

burns

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization May cause sensitization by inhalation.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause allergic skin reaction.

Germ cell mutagenicity No data available.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data.

IARC Monographs. Overall Evaluation of Carcinogenicity

Cobalt (CAS 7440-48-4) 2B Possibly carcinogenic to humans.

Copper Aluminum Alloys

SDS #109 Version: 1.0 Issue date: June 01, 2015

5 / 9

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) **NTP Report on Carcinogens** Nickel (CAS 7440-02-0)

2B Possibly carcinogenic to humans.

1 Carcinogenic to humans.

Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity

Nickel: Has shown teratogenic effects in laboratory animals. Lead is a teratogen. Elevated lead exposure of either parent before pregnancy may increase the changes of miscarriage or birth defects. Continuous exposure may result in decreased fertility. Exposure of the mother during pregnancy may cause birth defects. In experimental animal studies, cobalt produces adverse developmental effects at doses that produce maternal toxicity. There are no human data on cobalt exposure during pregnancy.

Specific target organ toxicity single exposure

Not available.

Specific target organ toxicity -

Causes damage to the following organs through prolonged or repeated exposure: Lung. Central

nervous system.

repeated exposure **Aspiration hazard**

Not available.

Chronic effects

Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information

Lead is accumulated in the body and may cause damage to the brain and nervous system after prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

Components		Species	Test Results
Lead (CAS 7439-92-1)			
	LC50	Rainbow trout, donaldson trout (Oncorhynhus mykiss)	1.17 mg/l, 96 Hours
Persistence and degradability	The produ	ct is not biodegradable.	
Bioaccumulative potential	The product contains potentially bioaccumulating substances.		bstances.
Mobility in soil	Alloys in massive forms are not mobile in the environment.		nment.
Mobility in general	Alloys in n	nassive forms are not mobile in the enviro	nment.
Other adverse effects	An enviror	nmental hazard cannot be excluded in the	event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations

Dispose in accordance with all applicable regulations.

Hazardous waste code

Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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

Not applicable.

14. Transport information

DOT

> UN3077 **UN number**

UN proper shipping name Environmentally hazardous substances, solid, n.o.s. (Lead RQ = 393 LBS)

Transport hazard class(es) Subsidiary class(es) Ш **Packing group**

Special precautions for user Not available.

Labels required

8, 146, B54, IB8, IP3, N20, T1, TP33 Special provisions

155 Packaging exceptions Packaging non bulk 213 240 Packaging bulk

IATA

UN3077 **UN** number

UN proper shipping name Environmentally hazardous substance, solid, n.o.s. (Lead)

Transport hazard class(es)

Copper Aluminum Alloys FNG 6/9 Issue date: June 01, 2015

SDS #109 Version: 1.0

Subsidiary class(es) Ш Packaging group Labels required 9 9L **ERG Code**

Special precautions for user Not available.

IMDG

UN number UN3077

UN proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead)

Transport hazard class(es) Subsidiary class(es) Ш **Packaging group Environmental hazards**

Marine pollutant Yes Labels required **EmS** F-A, S-F Special precautions for user Not available.

Transport in bulk according to

Annex II of MARPOL 73/78 and

the IBC Code

No information available.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Cobalt (CAS 7440-48-4) LISTED Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED Manganese (CAS 7439-96-5) LISTED Nickel (CAS 7440-02-0) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

> Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No

SARA 302 Extremely Nο

hazardous substance

SARA 311/312 Hazardous Yes

chemical

Other federal regulations

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

Cobalt (CAS 7440-48-4) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

Copper Aluminum Alloys SDS #109 Version: 1.0 7/9

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Aluminum (CAS 7429-90-5) Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0)

Silicon (CAS 7440-21-3)

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

Aluminum (CAS 7429-90-5) 500 LBS Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) 500 LBS Manganese (CAS 7439-96-5) 500 LBS Nickel (CAS 7440-02-0) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Aluminum (CAS 7429-90-5) Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Silicon (CAS 7440-21-3)

US. Rhode Island RTK

Aluminum (CAS 7429-90-5) Cobalt (CAS 7440-48-4) Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Manganese (CAS 7439-96-5) Nickel (CAS 7440-02-0) Silicon (CAS 7440-21-3)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Cobalt (CAS 7440-48-4) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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
*Δ "Ves" indicates this product co	amplies with the inventory requirements administered by the governing country(s)	

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

16. Other information, including date of preparation or last version

1.0

Issue date June 01, 2015

Version #

Further information Not available.

Copper Aluminum Alloys Issue date: June 01, 2015

SDS #109 Version: 1.0

References

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

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

ENG Copper Aluminum Alloys SDS #109 Version: 1.0 9/9



SAFETY DATA SHEET

1. Identification

Product identifier Phos Copper Tin Alloys

Other means of identification

SDS number 110 C51000 **Product code** Recommended use Manufacturing

Use in accordance with supplier's recommendations. Recommended restrictions

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone Corporste: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6937

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Reproductive toxicity Category 1A

OSHA hazard(s) Not classified.

Label elements

Hazard symbol



Signal word Danger

May damage fertility or the unborn child. **Hazard statement**

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read

and understood. Use personal protective equipment as required.

Response If exposed or concerned: Get medical advice/attention.

Storage Store locked up.

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

Hazard(s) not otherwise classified (HNOC)

Not classified.

Hazardous to the aquatic environment, Category 2 **Environmental hazards**

long-term hazard

3. Composition/information on ingredients

Hazardous components

Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	87-95
Tin		7440-31-5	1.5-11
Zinc		7440-66-6	0-4.5
Lead		7439-92-1	0-4
Nickel		7440-02-0	0-0.2

Phos Copper Tin Alloys **ENG** 1/8

SDS #110 Version: 1.0 Issue date: June 01, 2015 **Composition comments**

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation

In case of exposure to fumes or particulates: Move to fresh air. Get medical attention if discomfort

persists.

Skin contact

Contact with dust: Wash skin with soap and water. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye contact

Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time under eyelids. If discomfort continues, consult a physician.

Ingestion

Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

personnel. Get medical attention if any discomfort continues.

Most important

symptoms/effects, acute and delayed

May cause irritation to mucous membranes. May cause skin and eye irritation. Cough. Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or central nervous system disturbances and anemia.

Indication of immediate medical attention and special treatment needed

Treat symptomatically. Symptoms may be delayed.

General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal: Explosion hazard could result.

Specific hazards arising from the chemical

Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions Move containers from fire area if you can do it without risk.

Specific methods

Move containers from fire area if you can do so without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. If not possible, gently moisten dust before it is collected with shovel, broom or the like. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. Avoid dust formation. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

7. Handling and storage

Precautions for safe handling

Follow special national provisions related to work with lead and its compounds. Pregnant women should not work with the product, if there is the least risk of lead exposure. Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid inhalation of dust and contact with skin and eyes. Avoid generation and spreading of dust and fumes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Keep dry. Store away from incompatible materials.

Phos Copper Tin Alloys **ENG** SDS #110 Version: 1.0 Issue date: June 01, 2015

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components		Туре		Value	
Lead (CAS 7439-92-1) US. OSHA Table Z-1 Limi		TWA nants (29 CFR 1910	.1000)	0.05 mg/m3	
Components		Туре		Value	Form
Copper (CAS 7440-50-8)		PEL		1 mg/m3	Dust and mist.
N: 1 .1 (0 A O 7 A 4 O 0 O 0)		DEI		0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5)		PEL PEL		1 mg/m3 2 mg/m3	
US. ACGIH Threshold Lir		PEL		2 mg/ms	
Components		Туре		Value	Form
Copper (CAS 7440-50-8)		TWA		1 mg/m3	Dust and mist.
Load (CAS 7420 02 4)		TWA		0.2 mg/m3	Fume.
Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)		TWA		0.05 mg/m3 1.5 mg/m3	Inhalable fraction.
Tin (CAS 7440-31-5)		TWA		2 mg/m3	ililialable liaction.
US. NIOSH: Pocket Guide				2 mg/m3	
					Form
Components		Type		Value	
Copper (CAS 7440-50-8) Lead (CAS 7439-92-1)		REL REL		1 mg/m3 0.05 mg/m3	Dust and mist.
Nickel (CAS 7440-02-0)		REL		0.03 mg/m3	
Tin (CAS 7440-31-5)		REL		2 mg/m3	
ological limit values		TALL.		2 mg/mo	
US. ACGIH. BEIs. Biologi	ical Exposure Indi	ces			
Components	Value	Determinant	Sampling T	ime	
Lead (CAS 7439-92-1)	300 μg/l	Lead	*		
* - For sampling details, plo	ease see the source	document.			
posure guidelines	Follow standar	rd monitoring proced	ures.		
propriate engineering ntrols	inhalation of d equipment if a divided metalli	ust. Ventilate as nee irborne dust levels a c dust generated by	ded to control aire high. Special grinding, sawing	rborne dust. Use of ventilation should g etc., in order to e	s and minimize the risk of explosion-proof ventilation be used to convey finely diminate explosion hazards. h lead and its compounds.
ividual protection measur	es, such as persor	nal protective equip	ment		
Eye/face protection	glasses or gog burning, or bra	gles, a welding helm	et with appropri recommended	ate shaded shield	tact. In addition to safety is required during welding, ety glasses or goggles,
Skin protection					
Hand protection					material is heated, wear mmended by the glove
Other	Wear suitable	protective clothing.			
Respiratory protection	exposure limit, meets OSHA's place condition	use a NIOSH appro 29 CFR 1910.134 a ns warrant a respirat	ved respirator fo and ANSI Z88.2 or's use. In case	or dusts. A respira requirements mus of inadequate ve	s below the applicable tory protection program that t be followed whenever work ntilation or risk of inhalation idvice from local supervisor.
Thermal hazards	Wear appropri	Wear appropriate thermal protective clothing, when necessary.			
neral hygiene nsiderations	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. Contaminated uniforms should be laundered separately fron other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.				

Phos Copper Tin Alloys ENG SDS #110 Version: 1.0

9. Physical and chemical properties

Appearance Solids, Shapes, Tubes, Turnings & Bushings.

Physical state Solid.

Form Solids, Shapes, Tubes, Turnings & Bushings.

Color Yellow to red.

Odor None.

Odor threshold Not available. Not available. Not available. Melting point/freezing point Initial boiling point and boiling Not available.

range

Not available. Flash point Not available **Evaporation rate** Flammability (solid, gas) Not applicable. Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

Flammability limit - upper

(%)

Not available.

Not available. Explosive limit - lower (%) Explosive limit - upper (%) Not available. Not available. Vapor pressure Not available. Vapor density Relative density Not available. Solubility(ies) Insoluble in water.

Partition coefficient (n-octanol/water)

Not available.

Not available. Auto-ignition temperature Not available. **Decomposition temperature** Viscosity Not available.

10. Stability and reactivity

Reactivity Stable at normal conditions.

Chemical stability Massive metal is stable and non reactive under normal conditions of use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Contact with acids will release flammable hydrogen gas. Hot molten material will react violently with water resulting in spattering and fuming.

Conditions to avoid Contact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Lead oxide fumes may be formed at elevated temperatures.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting.

May cause respiratory tract irritation. Elevated temperatures or mechanical action may form dust Inhalation

and fumes which may be irritating to the mucous membranes and respiratory tract.

Skin contact May cause skin irritation. Hot or molten material may produce thermal burns.

Eye contact May cause eye irritation. Molten material will produce thermal burns.

Symptoms related to the physical, chemical and toxicological characteristics May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing. Shortness of breath. Wheezing. The principal symptoms of lead poisoning are gastro-intestinal or

central nervous system disturbances and anemia.

Information on toxicological effects

Phos Copper Tin Alloys ENG SDS #110 Version: 1.0

May cause eye, skin and respiratory tract irritation. Dusts may irritate the respiratory tract, skin **Acute toxicity**

and eyes. High concentrations of freshly formed fumes/dusts of metal oxides can produce

symptoms of metal fume fever.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization

No data available.

Skin sensitization The product contains a small amount of sensitizing substance which may provoke an allergic

reaction among sensitive individuals in contact with skin.

Germ cell mutagenicity

No data available.

Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Lead (CAS 7439-92-1) 2B Possibly carcinogenic to humans.

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity May damage fertility or the unborn child. Contains a substance/a group of substances which may

cause harm to the unborn child.

Specific target organ toxicity -

single exposure

No data available.

Specific target organ toxicity -

repeated exposure

Not available.

Aspiration hazard Not applicable.

Chronic effects Danger of cumulative effects. Prolonged and repeated overexposure to dust and fumes can lead

to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal fume fever. Lead may produce maternal toxicity, toxicity to the fetus, and adverse effects to blood, bone marrow, central/peripheral nervous systems, kidney, liver, and reproductive system.

Further information Lead is accumulated in the body and may cause damage to the brain and nervous system after

prolonged exposure. Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation or

pulmonary discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

Components **Species Test Results**

Lead (CAS 7439-92-1)

LC50 1.17 mg/l, 96 Hours Rainbow trout, donaldson trout

(Oncorhynhus mykiss)

Persistence and degradability The product is not biodegradable.

Bioaccumulative potential The product contains potentially bioaccumulating substances. Mobility in soil Alloys in massive forms are not mobile in the environment.

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

Other adverse effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions This material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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 Not applicable.

14. Transport information

DOT

UN number UN3077

UN proper shipping name Environmentally hazardous substances, solid, n.o.s. (Lead RQ = 393 LBS)

Transport hazard class(es)

Phos Copper Tin Alloys **ENG** SDS #110 Version: 1.0 5/8 Issue date: June 01, 2015

Subsidiary class(es) Ш Packing group

Special precautions for user Not available.

9 Labels required

8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33 Special provisions

Packaging exceptions 155 Packaging non bulk 213 240 Packaging bulk

IATA

UN number UN3077

UN proper shipping name Environmentally hazardous substance, solid, n.o.s. (Lead)

Transport hazard class(es) Subsidiary class(es) Ш Packaging group 9 Labels required **ERG Code** 9L

Special precautions for user Not available.

IMDG

UN3077 **UN number**

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead), MARINE **UN proper shipping name**

POLLUTANT

Transport hazard class(es) 9 Subsidiary class(es) Ш **Packaging group** 9 Labels required F-A, S-F **EmS** Special precautions for user Not available.

Transport in bulk according to

Annex II of MARPOL 73/78 and

the IBC Code

Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Lead (CAS 7439-92-1) 29 CFR 1910.1025

CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8) LISTED Lead (CAS 7439-92-1) LISTED Nickel (CAS 7440-02-0) LISTED Zinc (CAS 7440-66-6) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

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

SARA 302 Extremely No

hazardous substance

SARA 311/312 Hazardous

Yes

chemical

Other federal regulations

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

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Phos Copper Tin Alloys **ENG** SDS #110 Version: 1.0 6/8

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical **Code Number**

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

WARNING: This product contains chemicals known to the State of California to cause cancer **US** state regulations

and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

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

Copper (CAS 7440-50-8) 500 LBS Lead (CAS 7439-92-1) 500 LBS Nickel (CAS 7440-02-0) 500 LBS Zinc (CAS 7440-66-6) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. Rhode Island RTK

Copper (CAS 7440-50-8) Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0) Tin (CAS 7440-31-5) Zinc (CAS 7440-66-6)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Lead (CAS 7439-92-1) Nickel (CAS 7440-02-0)

International Inventories

Country(s) or region

	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)				

On inventory (vec/ne)*

7/8

16. Other information, including date of preparation or last version

Issue date: June 01, 2015

Inventory name

Issue date June 01, 2015

Version #

10

Further information Not available.

ENG Phos Copper Tin Alloys SDS #110 Version: 1.0

References

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

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

Phos Copper Tin Alloys ENG

SDS #110 Version: 1.0 Issue date: June 01, 2015



SAFETY DATA SHEET

1. Identification

Product identifier Bismuth Alloys

Other means of identification

SDS number 111

Product code C89320, C89325, C89510, C89360, C89510, C89520, C89530, C89831, C89833, C89835,

C89836, C89837

Recommended use Manufacturing **Recommended restrictions** Not assigned.

Manufacturer / Importer / Supplier / Distributor information Company name Spectrum Machine, Inc.

Address Corporate: 1668 Frost Rd., Streetsboro, OH 44241

Telephone Corporate: 1-330-626-3666

Contact person Tim Lamb

E-mail timlamb@spectrummachine.com

Emergency phone number 1-888-276-6737

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Sensitization, skin Category 1

Carcinogenicity Category 2 Specific target organ toxicity, repeated Category 2 (Lung)

exposure

Not classified.

OSHA hazard(s) Label elements

Hazard symbol



Signal word Warning

Hazard statement May cause an allergic skin reaction. Suspected of causing cancer. May cause damage to organs

(Lung) through prolonged or repeated exposure by inhalation.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read

> and understood. Use personal protective equipment as required. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing. Do not

breathe fumes and dusts.

Response If on skin: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical

> advice/attention. Specific treatment (see this label). Wash contaminated clothing before reuse. If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel

> > 1/7

unwell.

Storage Store locked up.

Disposal Dispose of contents/container to a facility that has permission of disposing the industrial waste.

Hazard(s) not otherwise

classified (HNOC)

Not classified.

3. Composition/information on ingredients

Mixture

Hazardous components

Chemical name	Common name and synonyms	CAS number	%
Copper	,	7440-50-8	85-91
Tin		7440-31-5	4-7.5

Bismuth Alloys SDS ENG #110 Version: 1.0

Hazardous components			
Chemical name	Common name and synonyms	CAS number	%
	Synonyms		
Bismuth		7440-69-9	0.5-6
Selenium		7782-49-2	0-1.1
Nickel		7440-02-0	0-1

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The alloy contains additional alloying elements at concentrations below disclosure requirements. At temperatures above the melting point the alloys may liberate fumes containing oxides of alloying elements.

4. First-aid measures

Inhalation In case of exposure to fumes or particulates: Move to fresh air. Get medical attention if discomfort

persists.

Skin contact Contact with dust: Wash skin with soap and water. In case of allergic reaction or other skin

disorders: Seek medical attention and bring along these instructions. In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be

treated promptly with thorough cleansing of the affected area.

Eye contact Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to

rinse under eyelids. If irritation persists, continue flushing for 15 minutes, rinsing from time to time

May cause skin and eye irritation. May cause irritation to mucous membranes. Cough. Shortness

under eyelids. If discomfort continues, consult a physician.

Ingestion Rinse mouth thoroughly if dust is ingested. Only induce vomiting at the instruction of medical

Treat symptomatically. Symptoms may be delayed.

personnel. Get medical attention if any discomfort continues.

Most important

symptoms/effects, acute and

delayed

of breath. Wheezing. Sensitization.

Indication of immediate medical attention and special treatment needed

General information

Get medical attention if any discomfort develops. Seek medical attention for all burns, regardless

how minor they may seem. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing

media

Special powder against metal fires. Dry sand.

Do not use water or halogenated extinguishing media. Do not use water on molten metal:

Explosion hazard could result.

Specific hazards arising from

the chemical

During fire, gases hazardous to health may be formed. Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air. In a fire, nickel may

form nickel carbonyl, a highly toxic substance and known carcinogen.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in

the workplace.

Fire-fighting equipment/instructions Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions. protective equipment and emergency procedures

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Methods and materials for containment and cleaning up

Avoid dust formation. Allow spilled material to solidify and scrape up with shovels into a suitable container for recycle or disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. The vacuum cleaner should be explosion-proofed. If not possible, gently moisten dust before it is collected with shovel, broom or the like. This material and its container must be disposed of as hazardous waste.

Environmental precautions

Avoid release to the environment. Do not contaminate water.

ENG Bismuth Alloys SDS

Issue date: June 01, 2015

#110 Version: 1.0

7. Handling and storage

Precautions for safe handling

Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts of metal oxides. Provide adequate ventilation. Avoid contact with sharp edges and hot surfaces. Avoid inhalation of dust and contact with skin and eyes. Avoid generation and spreading of dust and fumes. Avoid contact with hot or molten material. Dust clouds may be explosive under certain conditions. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Wear appropriate personal protective equipment. Do not use water on molten metal. Do not eat, drink or smoke when using the product. Keep the workplace clean. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Keep dry. Store away from incompatible materials.

8. Exposure controls/personal protection

Occupational exposure limits

IIS OSHA Table 7-1 Limits for Air Contaminants (29 CFR 1910 1000)

Components	Туре	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m3	Dust and mist.
	· 	0.1 mg/m3	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m3	
Selenium (CAS 7782-49-2)	PEL	0.2 mg/m3	
Tin (CAS 7440-31-5)	PEL	2 mg/m3	
US. ACGIH Threshold Limit	V alues		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
,		0.2 mg/m3	Fume.
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m3	Inhalable fraction.
Selenium (CAS 7782-49-2)	TWA	0.2 mg/m3	
Tin (CAS 7440-31-5)	TWA	2 mg/m3	
US. NIOSH: Pocket Guide to	Chemical Hazards		
Components	Туре	Value	Form
Copper (CAS 7440-50-8)	REL	1 mg/m3	Dust and mist.
Nickel (CAS 7440-02-0)	REL	0.015 mg/m3	
Selenium (CAS 7782-49-2)	REL	0.2 mg/m3	
Tin (CAS 7440-31-5)	REL	2 mg/m3	
logical limit values	No biological exposure limits noted for	r the ingredient(s).	
osure guidelines	Follow standard monitoring procedure	es.	
propriate engineering trols	Provide adequate ventilation. Observe inhalation of dust. Ventilate as needed equipment if airborne dust levels are hidvided metallic dust generated by grid	I to control airborne dust. Use nigh. Special ventilation should	explosion-proof ventilation be used to convey finely
vidual protection measures,	such as personal protective equipme	ent	
Eye/face protection	Wear dust-resistant safety goggles which glasses or goggles, a welding helmet burning, or brazing. A face shield is reducing a spirit face shield in the same shield	with appropriate shaded shield commended, in addition to saf	is required during welding,
	during sawing, grinding, or machining	•	
Skin protection	during sawing, grinding, or machining		
Skin protection Hand protection	Wear suitable protective gloves to pre gloves to protect against thermal burn supplier.	vent cuts and abrasions. Wher	
=	Wear suitable protective gloves to pre gloves to protect against thermal burn	vent cuts and abrasions. Wher	
Hand protection	Wear suitable protective gloves to pre gloves to protect against thermal burn supplier.	vent cuts and abrasions. When s. Suitable gloves can be recook of inhalation of dust, use suitentrols are not sufficient to low H approved respirator for dust.	mmended by the glove table respiratory equipment yer exposure levels below the s. A respiratory protection the sirements must be followed

ENG Bismuth Alloys SDS 3/7 #110 Version: 1.0

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. Contaminated uniforms should be laundered separately from other clothing to prevent potential cross-contamination. If possible, an industrial laundry service should be used to eliminate the possibility of contaminating the home environment. Handle in accordance with good industrial hygiene and safety practices. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Shapes, Solids, Tubes & Turnings.

Physical state Solid.

Form Shapes, Solids, Tubes & Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available. pH Unknown.

Melting point/freezing point 1725.8 °F (941 °C)

Initial boiling point and boiling

range

Not available.

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower

er Not available.

(%)

Flammability limit - upper

Not available.

(%)

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density Not available.

Solubility(ies) Insoluble in water.

Partition coefficient

Not available.

(n-octanol/water)

Auto-ignition temperatureNot available.Decomposition temperatureNot available.ViscosityNot available.

Other information

Bulk density 0.313 - 0.323 lb/in³

10. Stability and reactivity

Reactivity Not available.

Chemical stability Stable at normal conditions. Massive metal is stable and non reactive under normal conditions of

use, storage and transport.

Possibility of hazardous

reactions

Hazardous polymerization does not occur. Hot molten material will react violently with water

resulting in spattering and fuming.

Conditions to avoidContact with incompatible materials. Contact with acids will release flammable hydrogen gas.

Avoid dust formation. Dust clouds may be explosive under certain conditions.

Incompatible materials Acids. Ammonium nitrate. Fluoride. Halogens. Nitrates. Phosphorus. Strong oxidizing agents.

Sulfur.

Hazardous decomposition

products

Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and

fumes of metal oxides. Phosphorus oxides. Selenium/selenium oxides.

11. Toxicological information

Information on likely routes of exposure

Ingestion Not relevant, due to the form of the product. However, ingestion of dusts generated during

working operations may cause nausea and vomiting.

Bismuth Alloys SDS ENG #110 Version: 1.0 4 / 7

Inhalation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the mucous membranes and respiratory tract. In sensitized individuals, exposure causes an

asthma-like attack, with wheezing, bronchospasm, and dyspnea.

Skin contact May cause an allergic skin reaction. Hot or molten material may produce thermal burns. Workers

allergic to nickel may develop eczema or rashes. Acute exposure to cobalt metal, dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like

attack, with wheezing, bronchospasm, and dyspnea.

Eye contact Molten material will produce thermal burns. Elevated temperatures or mechanical action may form

dust and fumes which may be irritating to the eye.

Symptoms related to the physical, chemical and toxicological characteristics

May cause irritation to mucous membranes. May cause skin and eye irritation. Coughing.

Wheezing. Shortness of breath. Sensitization.

Information on toxicological effects

Acute toxicity High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of

metal fume fever. Acute exposure to dust, and fume may cause irritation of skin and eyes. In sensitized individuals, exposure causes an asthma-like attack, with wheezing, bronchospasm,

and dyspnea.

Skin corrosion/irritation Elevated temperatures or mechanical action may form dust and fumes which may be irritating to

the eye, mucous membranes and respiratory tract. Hot or molten material may produce thermal

burns.

Serious eye damage/eye

irritation

Dust from machining operation in the eyes may cause irritation.

Respiratory sensitization Not classified.

Skin sensitization Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

May cause sensitization by skin contact. Pre-existing skin conditions including dermatitis might be

aggravated by exposure to this product.

Germ cell mutagenicity No data available.

Carcinogenicity Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Nickel (CAS 7440-02-0) 1 Carcinogenic to humans.

Selenium (CAS 7782-49-2) 3 Not classifiable as to carcinogenicity to humans.

NTP Report on Carcinogens

Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Nickel: Has shown teratogenic effects in laboratory animals.

Specific target organ toxicity -

single exposure

May cause respiratory irritation.

Specific target organ toxicity -

repeated exposure

Causes damage to the following organs through prolonged or repeated exposure: Lung.

Aspiration hazard Not available.

Chronic effects Harmful: danger of serious damage to health by prolonged exposure through inhalation. Chronic

inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Prolonged and repeated overexposure to dust and fumes can lead to benign pneumoconiosis (stannosis). Chronic inhalation of metallic oxide dust/fume may cause metal

fume fever.

Further information Welding or plasma arc cutting of metal and alloys can generate ozone, nitric oxides and ultraviolet

radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary

discomfort. UV radiation can cause skin erythema and welders flash.

12. Ecological information

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

substance which may cause long-term adverse effects in the environment.

Components Species Test Results

Selenium (CAS 7782-49-2)

Aquatic

Fish LC50 Fathead minnow (Pimephales promelas) 0.94 - 1.2 mg/l, 96 hours

Persistence and degradability The product is not biodegradable.

Bioaccumulative potentialThe product contains potentially bioaccumulating substances.Mobility in soilAlloys in massive forms are not mobile in the environment.Mobility in generalAlloys in massive forms are not mobile in the environment.

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Bismuth Alloys SDS ENG #110 Version: 1.0 5 / 7

13. Disposal considerations

Disposal instructionsThis material and its container must be disposed of as hazardous waste. Dispose in accordance

with all applicable regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code Z110: Inorganic compounds n.o.s.

Waste from residues / unused

products

Recover and recycle, if practical. 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 Not applicable.

14. Transport information

DOT

Not regulated as a hazardous material by DOT.

IATA

Not regulated as a dangerous good.

IMDG

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL 73/78 and

No information available.

the IBC Code

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

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

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

CERCLA Hazardous Substance List (40 CFR 302.4)

 Copper (CAS 7440-50-8)
 LISTED

 Nickel (CAS 7440-02-0)
 LISTED

 Selenium (CAS 7782-49-2)
 LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

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

SARA 302 Extremely hazardous substance

No

SARA 311/312 Hazardous

Yes

chemical

Other federal regulations

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

Nickel (CAS 7440-02-0) Selenium (CAS 7782-49-2)

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

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

US state regulationsWARNING: This product contains a chemical known to the State of California to cause cancer.

Bismuth Alloys SDS ENG #110 Version: 1.0 6 / 7

US. Massachusetts RTK - Substance List

Copper (CAS 7440-50-8) Nickel (CAS 7440-02-0) Selenium (CAS 7782-49-2) Tin (CAS 7440-31-5)

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

 Copper (CAS 7440-50-8)
 500 LBS

 Nickel (CAS 7440-02-0)
 500 LBS

 Selenium (CAS 7782-49-2)
 500 LBS

Inventory name

US. Pennsylvania RTK - Hazardous Substances

Copper (CAS 7440-50-8) Nickel (CAS 7440-02-0) Selenium (CAS 7782-49-2) Tin (CAS 7440-31-5)

US. Rhode Island RTK

Copper (CAS 7440-50-8) Nickel (CAS 7440-02-0) Selenium (CAS 7782-49-2) Tin (CAS 7440-31-5)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Australian Inventory of Chemical Substances (AICS)

Nickel (CAS 7440-02-0)

International Inventories

Australia

Country(s) or region

	· · · · · · · · · · · · · · · · · · ·	
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

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

Toxic Substances Control Act (TSCA) Inventory

16. Other information, including date of preparation or last version

Issue date June 01, 2015

Version # 1.0

United States & Puerto Rico

Further information Not available.

References 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

Bismuth Alloys SDS

The information in this MSDS was obtained from industry sources that we believe to be reliable. However, the information is provided without any representation or warranty, expressed or implied regarding the accuracy or correctness. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product.

#110 Version: 1.0 Issue date: June 01, 2015

On inventory (yes/no)*

Yes

Yes