SAFETY DATA SHEET

1. Identification

Product identifier Copper Zinc Alloys

Other means of identification

SDS number 3

Product code C21000, C22000, C22600, C23000, C24000, C26000, C26100, C26800, C27000, C27450, C28000, C31400, C31600, C36000, C37700, C44300, C46400, C67300, C67310, C67400, C69300, C69340, C83400, CGM-7, CA673-MOD, ADVSI, 422, 70/30, 80/20

Recommended use Manufacturing

Recommended restrictions Not assigned.

Manufacturer / Importer / Supplier / Distributor information

Address
Telephone
E-mail
Contact person
Emergency phone number

Company name

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards

Sensitization, skin	Category 1
Carcinogenicity	Category 2
Reproductive toxicity (fertility, the unborn child)	Category 1A
Specific target organ toxicity, repeated exposure	Category 2 (Lung, central nervous system)

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.

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, long-term hazard	Category 2

3. Composition/information on ingredients

Mixture

Hazardous components Chemical name	Common name and synonyms	CAS number	%
Copper		7440-50-8	59-96
Zinc		7440-66-6	6.2 - 41
Silicon		7440-21-3	0-4.5
Lead		7439-92-1	0 - 3.7
Tin		7440-31-5	0.005 - 3.5
Manganese		7439-96-5	0-3.5
Aluminum		7429-90-5	0-2
Nickel		7440-02-0	0.005-1.2

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 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 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.

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	Type	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	Type	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	
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 Values

Components	Type	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	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	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	
Silicon (CAS 7440-21-3)	REL	5 mg/m3	Respirable.
		10 mg/m3	Total
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 Solids, Rectangles, Shapes, Tubes, Clips, Shells and Turnings.

Physical state Solid.

Form Solids, Rectangles, Shapes, Tubes, Clips, Shells and Turnings.

Color Yellow to red.

Odor None.

Odor threshold Not available.

pH Not available.

Melting point/freezing point Not available.

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.

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 (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	7.5 - 9 lb/in³

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.
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.

Components	Species	Test Results
Silicon (CAS 7440-21-3)		
Acute		
Oral		
LD50	Rat	3160 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	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.
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 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 = 270 LBS)
Transport hazard class(es)	9
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	III
Environmental hazards	
Marine pollutant	Yes
Labels required	9
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)

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 - Yes
SARA 302 Extremely hazardous substance	No
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)
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) Not regulated.

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 Administration (FDA) Not regulated.

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)
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
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)
Silicon (CAS 7440-21-3)
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)
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

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	11-05-2012
Revision date	-
Version #	01
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

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