Date of issue: 2018/05/08
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Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:
Product name: Zinc, powder
SDS No. : 87572E-3
Relevant identified uses of the substance or mixture and uses advised against
Research and Development
Details of the supplier of the safety data sheet
Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN
Division: Chemical Safety Management Department
Telephone number: +81-6-6946-8061
FAX: +81-6-6946-1607

Section 2. Hazards identification

GHS classification and label elements of the product
Classification of the substance or mixture
PHYSICAL AND CHEMICAL HAZARDS
Substances and mixtures which, in contact with water, emit flammable gases: Category 2
HEALTH HAZARDS
Serious eye damage/eye irritation: Category 2B
Reproductive toxicity: Category 2
Specific target organ toxicity - single exposure: Category 2 (respiratory system, systemic toxicity)
ENVIRONMENT HAZARDS
Hazardous to the aquatic environment, short-term (acute): Category 1
Hazardous to the aquatic environment, long-term (chronic): Category 1
(Note) GHS classification without description: Not classified/Classification not possible
Label elements

Signal word: Danger
HAZARD STATEMENT
H261 In contact with water releases flammable gas
H320 Causes eye irritation
H361 Suspected of damaging fertility or the unborn child
H371 May cause damage to organs (respiratory system, systemic toxicity)
H410 Very toxic to aquatic life with long lasting effects
PRECAUTIONARY STATEMENT
Prevention
P202 Do not handle until all safety precautions have been read and understood.
P273 Avoid release to the environment.
P223 Do not allow contact with water.
P231 + P232 Handle and store contents under inert gas/appropriate liquid or gas. Protect

from moisture.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash contaminated parts thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P270 Do not eat, drink or smoke when using this product.

Response

P370 + P378 In case of fire: Use appropriate media to extinguish.
P391 Collect spillage.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor/physician.
P302 + P335 + P334 IF ON SKIN: Brush off loose particles from skin. Immerse in cool water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/attention.

Storage

P405 Store locked up.
P402 + P404 Store in a dry place. Store in a closed container.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

Specific adverse human health effects

See "11. Toxicological Information".

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Substance

Ingredient name	Content (%)	CAS No.	ENCS	Chemical formula
Zinc	≧85	7440-66-6	-	Zn

Note : The figures shown above are not the specifications of the product.

Impurities

・Zinc oxide ≦5.0% (CAS No.1314-13-2)
・Lead ≦0.20% (CAS No.7439-92-1)
・Cadmium <0.10% (CAS No.7440-43-9)

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

IF exposed or concerned: Get medical advice/attention.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
IF INHALED: Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN

Take off immediately all contaminated clothing. Rinse skin with water or shower.
IF ON SKIN: Brush off loose particles from skin. Immerse in cool water.
If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy

to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth.
IF SWALLOWED: Call a POISON CENTER/doctor/physician if you feel unwell.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

Specific hazards arising from the substance or mixture

Fire may produce irritating, corrosive and/or toxic gases.
Runoff from fire control or dilution water may cause pollution.
See "10.Stability and Reactivity".

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.
Wear protective gloves/protective clothing/eye protection/face protection.
Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.
Ventilate area until material pick up is complete.
Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

Sweep up, place in a bag and hold for waste disposal.

Preventive measures for secondary accident

Collect spillage.

Section 7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Do not allow contact with water.

(Exhaust/ventilator)
Exhaust/ventilator should be available.
(Safety treatments)
Avoid contact with skin.
Avoid contact with eyes.

Safety Measures
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/protective clothing/eye protection/face protection.
Handle and store contents under inert gas/appropriate liquid or gas. Protect from moisture.
Wash hands et al thoroughly after handling.
When using do not eat, drink or smoke.

Any incompatibilities
See "10.Stability and Reactivity".

Advice on general occupational hygiene
Wash contaminated parts thoroughly after handling.
Do not eat, drink or smoke when using this product.

Storage

Conditions for safe storage
Keep container tightly closed.
Store locked up. (P405)
Store in a dry place. Store in a closed container.
Store in a cool, dry place. Do not store in direct sunlight.
Storage in accordance with local/national regulation.

Container and packaging materials for safe handling
Use closed unbreakable containers.

Section 8. Exposure controls/personal protection

Control parameters

Control value and Concentration standard value
(Lead)
Japan control value 0.05mg-Pb/m3
(Cadmium)
Japan control value 0.05mg-Cd/m3

Adopted value

The Japan Society for Occupational Health
(Zinc oxide)
0.5mg/m3 (nano particles)
(Lead)
0.03mg-Pb/m3
(Cadmium)
0.05mg-Cd/m3
(Other inorganic and organic dust (third class dust))
JSOH Respirable dust 2mg/m3, Total dust 8mg/m3

ACGIH
(Zinc oxide)
TWA: 2mg/m3(R); STEL: 10mg/m3(R) (Metal fume fever)
(Lead)
TWA: 0.05mg-Pb/m3 (CNS & PNS impair; hematologic eff)
(Cadmium)

TWA: 0.01mg-Cd/m3; TWA: 0.002mg-Cd/m3(R) (Kidney dam)

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.
Eye wash station should be available.
Washing facilities should be available.

Individual protection measures

Recommend to use protective equipment in conformity with the standards.
Use appropriate protective equipment in accordance with local/national regulation.

Respiratory protection

Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.

Hand protection

Wear impervious protective glove.

Eye protection

Wear eye/face protection. Wear safety goggles in cases gas is generated.

Skin and body protection

Wear protective clothing.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Powder
Color: Gray to blue
Odor: Odorless
Melting point/Freezing point: 419℃
Boiling point or initial boiling point: (Zinc)907℃
Boiling range data is not available.
Flammability (gases, liquids and solids) data is not available.
Lower and upper explosion limit/flammability limit data is not available.
Flash point data is not available.
Auto-ignition temperature: (Zinc)460℃
Decomposition temperature data is not available.
pH data is not available.
Kinematic viscosity data is not available.
Solubility:

Solubility in water: Reaction
Solubility in solvent data is not available.

n-Octanol/water partition coefficient data is not available.
Vapor pressure data is not available.
Density and/or relative density: 7.1g/cm3
Relative vapor density (Air=1) data is not available.
Particle characteristics data is not available.

Other information

Other information is not available.

Section 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

Ignites in air when finely divided. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.
On combustion forms zinc oxide fumes. The substance is a strong reducing agent. It reacts violently with oxidants, acids and bases. Reacts with water. This produces flammable/explosive gas (hydrogen). Reacts violently with sulfur, halogenated hydrocarbons and many other substances. This generates fire and explosion hazard. (ICSC 1205)

Conditions to avoid

Contact with incompatible materials.
Contact with fire source.

Incompatible materials

Acids, Bases, Oxidizing agents, Sulfur, Halogenated hydrocarbons, Water

Hazardous decomposition products

Zinc oxide, Hydrogen

Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Data for components of the product]

[NITE-CHRIP]
(Zinc)
rat LD50: > 2000 mg/kg (source: NITE)
(Zinc oxide)
rat LD50: > 5000 mg/kg (source: NITE)
(Cadmium)
rat LD50: 1140 mg/kg (source: NITE)

Acute toxicity (Dermal)

[Data for components of the product]

[NITE-CHRIP]
(Zinc oxide)
rabbit LD50: > 5000 mg/kg (source: NITE)

Acute toxicity (Inhalation)

[Data for components of the product]

[NITE-CHRIP]
(Zinc)
dust/mist: rat LC50: 5410 mg/m3 (OECD TG 403) (source: NITE)
(Zinc oxide)
dust/mist: rat LC50: > 5.7 mg/L (4-hour) (source: NITE)
(Cadmium)
dust/mist: rat LC50: 0.0031 mg/L (source: NITE)

Irritant properties

Skin corrosion/irritation data is not available.

Serious eye damage/irritation

[Product]

Category 2B, Causes eye irritation

[Data for components of the product]

[NITE-CHRIP]
(Zinc)
Category 2B (source: NITE)
Allergenic and sensitizing effects data is not available.
Mutagenic effects data is not available.
Carcinogenicity
[Data for components of the product]
[NITE-CHRIP]
(Lead)
Category 2 (source: NITE)
[IARC]
(Lead)
Group 2B : Possibly carcinogenic to humans
(Cadmium)
Group 1 : Carcinogenic to humans
[ACGIH]
(Lead)
A3(as Pb): Confirmed Animal Carcinogen with Unknown Relevance to Humans
(Cadmium)
A2(as Cd): Suspected Human Carcinogen
[NTP]
(Lead)
RAHC : Reasonably Anticipated to be Human Carcinogens
(Cadmium)
Known : Known to be Human Carcinogens
[EU]
(Cadmium)
Category 1B; Substances presumed to have carcinogenic potential for humans
Reproductive toxicity
[Product]
Category 2, Suspected of damaging fertility or the unborn child
[Data for components of the product]
[NITE-CHRIP]
(Zinc oxide)
Category 2 (source: NITE)
(Lead)
Category 1A (source: NITE)
Specific target organ toxicity (STOT)
STOT-single exposure
[Product]
Category 2, May cause damage to organs
[Data for components of the product]
[NITE-CHRIP]
(Zinc oxide)
Category 1 (respiratory system, systemic toxicity) (source: NITE)
STOT-repeated exposure data is not available.
Aspiration hazard data is not available.
Information on other hazards
May cause lung disorders by massive inhalation of powdered substance.
-e.g. fibrosis of lung tissue, cough, sputum, breath shortness, dyspnea, decline of lung

function, interstitial lung disease, pneumothorax

Section 12. Ecological Information

Toxicity

Aquatic toxicity

[Product]

Category 1, Very toxic to aquatic life

Category 1, Very toxic to aquatic life with long lasting effects

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[NITE-CHRIP]

(Zinc)

Algae (Pseudokirchneriella subcapitata) 72-hour ErC50: 0.15 mg/L (source: NITE)

(Zinc oxide)

Crustacea (Daphnia magna) 48-hour LC50: 0.098 mg Zn/L (source: NITE)

(Cadmium)

Algae (Pseudokirchneriella subcapitata) 72-hour ErC50: 0.07 mg/L (source: NITE)

Hazardous to the aquatic environment, long-term (chronic)

[NITE-CHRIP]

(Zinc oxide)

Algae (Pseudokirchneriella subcapitata) 72-hour NOEC: 24 μg Zn/L (29.9 μg ZnO/L) (source: NITE)

(Cadmium)

Fish (Salvelinus fontinalis) 10-day NOEC: 0.008 mg/L (source: NITE)

Water solubility

(Zinc)

reaction (source: ICSC, 2019)

(Zinc oxide)

none (source: ICSC, 2017)

(Lead)

practically insoluble (source: ICSC, 2019)

(Cadmium)

none (source: ICSC, 2005)

Persistence and degradability

[Data for components of the product]

(Zinc)

Not rapidly degradable (source: NITE)

Bioaccumulative potential

Bioaccumulative potential data is not available.

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.
Dispose of contents/container as industrial waste. Accordance with local/national regulation.

Section 14. Transport Information

UN Number or ID Number : 1436
UN Proper Shipping Name :
ZINC POWDER or ZINC DUST
Class or division (Transport hazard class) : 4.3
Subsidiary hazard(s) : 4.2
Packing group : II
ERG GUIDE No.: 138

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 1436
UN Proper Shipping Name :
ZINC POWDER or ZINC DUST
Class or division (Transport hazard class) : 4.3
Subsidiary hazard(s) : 4.2
Packing group : II

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 1436
UN Proper Shipping Name :
ZINC POWDER or ZINC DUST
Class or division (Transport hazard class) : 4.3
Subsidiary hazard(s) : 4.2
Hazard labels : Dang. when wet & Spont. comb.
Packing group : II

Environmental hazards

Marine pollutants (yes/no) : yes

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

Zinc oxide; Lead; Cadmium; Zinc

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Section 16. Other information

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 23rd edit., 2023 UN
IMDG Code, 2024 Edition (Incorporating Amendment 42-24)
IATA Dangerous Goods Regulations (66th Edition) 2025
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2025 TLVs and BEIs. (ACGIH)

JIS Z 7252 : 2019
JIS Z 7253 : 2019
2024 Recommendation on TLVs (JSOH)
Supplier's data/information

General Disclaimer

Please provide SDS to customers for selling or transferring.
All chemicals have unknown hazard. Handle the product with care.
This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.
The GHS classification data given here is based on current Data published in Japan (National Institute of Technology and Evaluation (NITE) Chemical Risk Information Platform (NITE-CHRIP), up to FY2023).