Safety Data Sheet

# 12 Mix metal standard solution

Version：V2.0.0.1
Report No.：BWB2636-2016-MSDS-US
Creation Date：2025/10/21
Revision Date：-

*Prepared according to American OSHA HCS-2024 (29 CFR 1910.1200)

## 1 Identification

### Product identifier

| | |
|---|---|
| Product Name | 12 Mix metal standard solution |
| Cat No. | BWB2636-2016 |
| CAS No. | Not applicable |
| EC No. | Not applicable |
| Molecular Formula | Not applicable |

### Recommended use of the product and restrictions on use

| | |
|---|---|
| Relevant identified uses | Please consult manufacturer. |
| Uses advised against | Please consult manufacturer. |

### Details of the supplier of the Safety Data Sheet

| | |
|---|---|
| Name of the company | Weiyel Inc |
| Address of the company | Hedian Light Industrial Park, Chengguan Town, Shangcheng County, Xinyang City, Henan Province, China |
| Post code | 465350 |
| Telephone number | 010-58103678 |
| Fax number | 010-84840368 |
| E-mail address | info@weiyel.com |

### Emergency phone number

| | |
|---|---|
| Emergency phone number | 010-58103678 |

## 2 Hazard(s) identification

### Hazard classification according to 29 CFR 1910.1200

| | |
|---|---|
| Skin corrosion/irritation | Category 1A |
| Serious eye damage/irritation | Category 1 |
| Acute Toxicity - Inhalation | Category 2 |

### Label elements

| | |
|---|---|
| Hazard pictograms |  |
| Signal word | Danger |

## Hazard statements

| | |
|---|---|
| H314 | Causes severe skin burns and eye damage |
| H318 | Causes serious eye damage |
| H330 | Fatal if inhaled |

## Precautionary statements

◆ Prevention

| | |
|---|---|
| P260 | Do not breathe gas/mist/vapour/spray. |
| P264 | Wash hands and other parts of the body (if related) thoroughly after handling. |
| P271 | Use only outdoors or with adequate ventilation. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. |
| P284 | In case of inadequate ventilation wear respiratory protection. |

◆ Response

| | |
|---|---|
| P320 | Specific treatment is urgent (see related instructions on the label). |
| P321 | Specific treatment (see related instructions on the label). |
| P363 | Wash contaminated clothing before reuse. |
| P304+P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P303+P361+P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower]. |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |

◆ Storage

| | |
|---|---|
| P405 | Store locked up. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |

◆ Disposal

| | |
|---|---|
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

## Other hazards

| | |
|---|---|
| | Not applicable. |

## Hazard description

◆ Physical and chemical hazards

| | |
|---|---|
| | No information available |

◆ Health hazards

| | |
|---|---|
| Inhaled | Inhalation of vapours or aerosols (mists, fumes), generated by the product during the course of normal handling, may produce severely toxic effects; these may be fatal. Corrosive product can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. |
| Ingestion | Accidental ingestion of the product may be harmful to the health of the individual. |
| Skin Contact | The product can cause severe skin burns following direct contact with the skin. |
| Eye | The product can produce severe chemical burns to the eye following direct contact. If timely and appropriate treatment is not available may cause permanent blindness. |

◆ Environmental hazards

| | |
|---|---|
| | Please refer to 12th chapter of SDS. |

## 3 Composition/information on ingredients

### Substance/mixture

| | |
|---|---|
| | Mixture |

| Component | CAS No. | EC No. | Concentration (wt, %) |
|---|---|---|---|
| **Arsenic** | 7440-38-2 | 231-148-6 | 0.01 |
| **Cadmium** | 7440-43-9 | 231-152-8 | 0.01 |
| **Cobalt** | 7440-48-4 | 231-158-0 | 0.01 |
| **Chromium** | 7440-47-3 | 231-157-5 | 0.01 |
| **Copper** | 7440-50-8 | 231-159-6 | 0.01 |
| **Manganese** | 7439-96-5 | 231-105-1 | 0.01 |
| **Molybdenum** | 7439-98-7 | 231-107-2 | 0.01 |
| **Nickel** | 7440-02-0 | 231-111-4 | 0.01 |
| **Lead** | 7439-92-1 | 231-100-4 | 0.01 |
| **Antimony** | 7440-36-0 | 231-146-5 | 0.01 |
| **Vanadium** | 7440-62-2 | 231-171-1 | 0.01 |
| **Zinc** | 7440-66-6 | 231-175-3 | 0.01 |
| **Hydrogen chloride** | 7647-01-0 | 231-595-7 | 5 |
| **Nitric acid** | 7697-37-2 | 231-714-2 | 5 |
| **Water** | 7732-18-5 | 231-791-2 | 89.88 |

## 4 First-aid measures

### Description of first aid measures

| | |
|---|---|
| **General advice** | Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance. |
| **Eye contact** | Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable. |
| **Skin contact** | Take off contaminated clothing and shoes immediately. Wash off with plenty of soap and water for at least 15 minutes and consult a physician if feel uncomfortable. |
| **Ingestion** | Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately. |
| **Inhalation** | Move victim into fresh air. If breathing is difficult, give oxygen. Do not use mouth to mouth resuscitation if victim ingested or inhaled the substance. If not breathing, give artificial respiration and consult a physician immediately. |
| **Protecting of first-aiders** | Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination. |

### Most important symptoms/effects, acute and delayed

| | |
|---|---|
| 1 | Substance accumulation, in the human body, may occur and may cause some concern following repeated or |

| | |
|---|---|
| | long-term occupational exposure. |

### Indication of any immediate medical attention and special treatment needed

| | |
|---|---|
| 1 | Treat symptomatically. |
| 2 | Symptoms may be delayed. |

## 5 Fire-fighting measures

### Extinguishing media

| | |
|---|---|
| Suitable extinguishing media | Use extinguishing media suitable for surrounding area. |
| Unsuitable extinguishing media | There is no restriction on the type of extinguisher which may be used. |

### Specific hazards arising from the substance or mixture

| | |
|---|---|
| 1 | Development of hazardous combustion gases or vapor possible in the event of fire. |
| 2 | May expansion or decompose explosively when heated or involved in fire. |

### Special protective equipment and precautions for fire-fighters

| | |
|---|---|
| 1 | As in any fire, wear self-contained breathing apparatus ( MSHA/NIOSH approved or equivalent) and full protective gear. |
| 2 | Fight fire from a safe distance, with adequate cover. |
| 3 | Prevent fire extinguishing water from contaminating surface water or the ground water system. |

## 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

| | |
|---|---|
| 1 | Use personal protective equipment,do not breathe gas/mist/vapour/spray. |
| 2 | Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges. |
| 3 | Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. |

### Environmental precautions

| | |
|---|---|
| 1 | Prevent further leakage or spillage if safe to do so. |
| 2 | Discharge into the environment must be avoided. |

### Methods and materials for containment and cleaning up

| | |
|---|---|
| 1 | Cut off the source of the leak as much as possible. |
| 2 | Keep leaks in a ventilated place. |
| 3 | Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by bunding. |
| 4 | Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. |
| 5 | Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container. |

## 7 Handling and storage

### Precautions for safe handling

| | |
|---|---|
| 1 | Handling is performed in a well ventilated place. |
| 2 | Wear suitable protective equipment. |
| 3 | Avoid contact with skin and eyes. |

| | |
|---|---|
| 4 | Keep away from heat/sparks/open flames/ hot surfaces. |

### Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| 1 | Keep containers tightly closed. |
| 2 | Keep containers in a dry, cool and well-ventilated place. |
| 3 | Keep away from heat/sparks/open flames/hot surfaces. |
| 4 | Store away from incompatible materials and foodstuff containers. |

## 8 Exposure controls/personal protection

### Control parameters

◆Occupational exposure limit values

| Component | Country/Region | Limit value - Eight hours | | Limit value - Short term | |
|---|---|---|---|---|---|
| | | ppm | mg/m³ | ppm | mg/m³ |
| **Arsenic** | Japan - JSOH(2024–2025) | - | 0.003( individual excess lifetime risk of cancer 10^-3) | - | - |
| | Permissible exposure standards for workers in the workplace | - | 0.01(as As) | - | 0.03(as As) |
| | Australia | - | 0.05 | - | - |
| | Canada - Ontario | - | 0.01 | - | 0.05 |
| | New Zealand | - | 0.001 | - | - |
| | USA - ACGIH | - | 0.01 | - | - |
| **Cadmium** | Japan - JSOH(2024–2025) | - | 0.05 | - | - |
| | Permissible exposure standards for workers in the workplace | - | 0.05(as Cd) | - | 0.15(as Cd) |
| | Australia | - | 0.01 | - | - |
| | Canada - Ontario | - | 0.01(inhalable fraction) | - | - |
| | European Union | - | 0.001 | - | - |
| | New Zealand | - | 0.004 | - | - |
| **Cobalt** | Japan - JSOH(2024–2025) | - | 0.05 | - | - |
| | Permissible exposure standards for workers in the workplace | - | 0.05(dust and fume) | - | 0.15(dust and fume) |
| | Australia | - | 0.05 | - | - |
| | Canada - Ontario | - | 0.02 | - | - |

| | | | | | |
|---|---|---|---|---|---|
| | New Zealand | - | 0.02 | - | - |
| | USA - ACGIH | - | 0.02( inhalable fraction) | - | - |
| **Chromium** | Japan - JSOH(2024–2025) | - | 0.5 | - | - |
| | Permissible exposure standards for workers in the workplace | - | 1 | - | 2 |
| | Australia | - | 0.5 | - | - |
| | Canada - Ontario | - | 0.5 | - | - |
| | European Union | - | 2 | - | - |
| | New Zealand | - | 0.5 | - | - |
| **Copper** | Permissible exposure standards for workers in the workplace | - | 1(dust and mist) | - | 2(dust and mist) |
| | Permissible exposure standards for workers in the workplace | - | 0.2(fume) | - | 0.6(fume) |
| | Australia | - | 0.2(fume, respirable fraction) | - | - |
| | Canada - Ontario | - | 0.2(fume, respirable fraction) | - | - |
| | New Zealand | - | 0.01 | - | - |
| | USA - ACGIH | - | 1(dust and mist) | - | - |
| **Manganese** | Japan - JSOH(2024–2025) | - | 0.02(respirable particles, as Mn) | - | - |
| | Japan - JSOH(2024–2025) | - | 0.1(total particulate, as Mn) | - | - |
| | Permissible exposure standards for workers in the workplace | - | 1(fume) | - | 2(fume) |
| | Australia | - | 1 | - | - |
| | Canada - Ontario | - | 0.2 | - | - |
| | European Union | - | 0.2 | - | - |
| **Molybdenum** | Australia | - | 10 | - | - |
| | Canada - Ontario | - | 10 | - | - |
| | New Zealand | - | 10 | - | - |
| | USA - ACGIH | - | 3( respirable fraction) | - | - |

| | | | | | |
|---|---|---|---|---|---|
| | Austria | - | 15(inhalable aerosol) | - | 30(inhalable aerosol) |
| | Canada - Québec | - | 10 | - | - |
| **Nickel** | Japan - JSOH(2024–2025) | - | 1 | - | - |
| | Permissible exposure standards for workers in the workplace | - | 1 | - | 2 |
| | Australia | - | 1 | - | - |
| | Canada - Ontario | - | 1 | - | - |
| | New Zealand | - | 0.005 | - | - |
| | USA - ACGIH | - | 1.5( inhalable fraction) | - | - |
| **Lead** | Japan - JSOH(2024–2025) | - | 0.03(as Pb) | - | - |
| | Permissible exposure standards for workers in the workplace | - | 0.05 | - | 0.15 |
| | Australia | - | 0.05 | - | - |
| | Canada - Ontario | - | 0.05 | - | - |
| | European Union | - | 0.15 | - | - |
| | New Zealand | - | 0.05 | - | - |
| **Antimony** | Japan - JSOH(2024–2025) | - | 0.1 | - | - |
| | Permissible exposure standards for workers in the workplace | - | 0.5 | - | 1.5 |
| | Australia | - | 0.5 | - | - |
| | Canada - Ontario | - | 0.5 | - | - |
| | New Zealand | - | 0.5 | - | - |
| | USA - ACGIH | - | 0.5 | - | - |
| **Vanadium** | Australia | - | 0.05 | - | - |
| | New Zealand | - | 0.05 | - | - |
| | USA - OSHA | - | - | 0.1 | 0.5 |
| | Austria | - | 0.5(inhalable aerosol) | - | 1(inhalable aerosol) |
| | Germany (DFG) | - | 0.005 | - | 0.01 |
| | Latvia | - | 1 | - | - |
| **Zinc** | Germany (DFG) | - | 2 | - | 4 |
| | Switzerland | - | 0.1(respirable aerosol) | - | 0.4(respirable aerosol) |

| | | | | | |
|---|---|---|---|---|---|
| **Hydrogen chloride** | Japan - JSOH(2024–2025) | - | - | - | - |
| | Permissible exposure standards for workers in the workplace | - | - | - | - |
| | Australia | - | - | 5 | 7.5 |
| | Canada - Ontario | - | - | 2 | - |
| | European Union | 5 | 8 | 10 | 15 |
| | USA - NIOSH | - | - | 5 | 7 |
| **Nitric acid** | Japan - JSOH(2024–2025) | 2 | 5.2 | - | - |
| | Permissible exposure standards for workers in the workplace | 2 | 5.2 | 4 | 10.4 |
| | Australia | 2 | 5.2 | 4 | 10 |
| | Canada - Ontario | 2 | - | 4 | - |
| | European Union | - | - | 1 | 2.6 |
| | New Zealand | 2 | 5.2 | 4 | 10 |

### Engineering controls

| | |
|---|---|
| 1 | Ensure adequate ventilation, especially in confined areas. |
| 2 | Ensure that eyewash stations and safety showers are close to the workstation location. |
| 3 | Use explosion-proof electrical/ventilating/lighting/equipment. |
| 4 | Set up emergency exit and necessary risk-elimination area. |

### Personal protection equipment

| | |
|---|---|
| **General requirement** |  |
| **Eye protection** | Must wear appropriate anti-corrosion goggles. |
| **Hand protection** | Must wear acid and alkali resistant chemical protective gloves. |
| **Respiratory protection** | Must wear appropriate personal dust proof gas mask. |
| **Skin and body protection** | Must wear acid and alkali resistant chemical protective clothing. |

## 9 Physical and chemical properties and safety characteristics

### Physical and chemical properties

| | |
|---|---|
| **Appearance (physical state, color, etc.)** | colorless liquid |
| **Odor** | No information available |
| **Odor threshold** | No information available |
| **pH** | No information available |

| | |
|---|---|
| Melting point/freezing point(°C) | No information available |
| Initial boiling point and boiling range(°C) | >35 |
| Flash point(Closed cup,°C) | No information available |
| Evaporation rate | No information available |
| Flammability | No information available |
| Upper/lower explosive limits[%(v/v)] | Upper limit : No information available ; Lower limit : No information available |
| Vapor pressure | No information available |
| Vapor density(Air = 1) | No information available |
| Relative density(Water=1) | No information available |
| Solubility | No information available |
| n-octanol/water partition coefficient | No information available |
| Auto-ignition temperature(°C) | No information available |
| Decomposition temperature(°C) | No information available |
| Kinematic viscosity | No information available |

## 10 Stability and reactivity

### Stability and reactivity

| | |
|---|---|
| Reactivity | Contact with incompatible substances can cause decomposition or other chemical reactions. |
| Chemical stability | Stable under proper operation and storage conditions. |
| Possibility of hazardous reactions | Mixtures with metallic acetylene, when heated, cause a fire or incandescence. Reacts severely with halogens, interhalogens or other strong oxidants, or causes a fire. In contact with magnesium, sodium, potassium, copper and other metals or metal acetylense may cause a fire or explosion. In contact with active metals (alkali metals, Na, Ca etc.) causes a reaction and release hydrogen. |
| Conditions to avoid | Incompatible materials, heat, flame and spark. |
| Incompatible materials | Metal acetylide, halogen, interhalogen, halogen oxides, nitric acid, nitrous oxide, nitrates, nitrites, halogen oxyacid salts, chromates, permanganates, inorganic peroxides, metal oxides and peroxyformic acid. Halogen, interhalogen, strong oxidant, water and acids. Magnesium, sodium, potassium, copper, oxidants, acetylene metal compounds, alcohols, alkanes, hydrogen and water. Alkali, sodium, calcium, and other active metal, halogen, metal oxide, nonmetal oxide, acyl halide and metal phosphide. |
| Hazardous decomposition products | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## 11 Toxicological information

### Acute toxicity

| Component | $LD_{50}$(oral) | $LD_{50}$(dermal) | $LC_{50}$(inhalation,4h) |
|---|---|---|---|
| **Manganese** | 9000mg/kg(Rat) | No information available | No information available |
| **Hydrogen chloride** | 900mg/kg(Rabbit) | No information available | 1405ppmV(Rat) |
| **Antimony** | 7000mg/kg(Rat) | No information available | No information available |

| | | | |
|---|---|---|---|
| **Cobalt** | 6171mg/kg(Rat) | No information available | No information available |
| **Cadmium** | 2330mg/kg(Rat) | No information available | No information available |
| **Arsenic** | 763mg/kg(Rat) | No information available | No information available |

### Carcinogenicity

| Component | List of carcinogens by the IARC Monographs | Report on Carcinogens by NTP | OSHA Carcinogen List |
|---|---|---|---|
| **Arsenic** | Category 1 | Category K | Listed |
| **Cadmium** | Category 1 | Category K | Listed |
| **Cobalt** | Category 2A | Category R | Not Listed |
| **Chromium** | Category 3 | Not Listed | Not Listed |
| **Copper** | Not Listed | Not Listed | Not Listed |
| **Manganese** | Not Listed | Not Listed | Not Listed |
| **Molybdenum** | Not Listed | Not Listed | Not Listed |
| **Nickel** | Category 2B | Category R | Not Listed |
| **Lead** | Category 2B | Category R | Not Listed |
| **Antimony** | Not Listed | Not Listed | Not Listed |
| **Vanadium** | Not Listed | Not Listed | Not Listed |
| **Zinc** | Not Listed | Not Listed | Not Listed |
| **Hydrogen chloride** | Category 3 | Not Listed | Not Listed |
| **Nitric acid** | Not Listed | Not Listed | Not Listed |
| **Water** | Not Listed | Not Listed | Not Listed |

### Others

| 12 Mix metal standard solution | |
|---|---|
| **Skin corrosion/irritation** | Causes severe skin burns and eye damage(Category 1A) |
| **Serious eye damage/irritation** | Causes serious eye damage(Category 1) |
| **Skin sensitization** | Based on available data, the classification criteria are not met |
| **Respiratory sensitization** | Based on available data, the classification criteria are not met |
| **Reproductive toxicity** | Based on available data, the classification criteria are not met |
| **STOT-repeated exposure** | Based on available data, the classification criteria are not met |
| **Aspiration hazard** | Based on available data, the classification criteria are not met |
| **Germ cell mutagenicity** | Based on available data, the classification criteria are not met |

## 12 Ecological information

### Acute aquatic toxicity

| Component | Fish | Crustaceans | Algae or other aquatic plants |
|---|---|---|---|
| **Manganese** | $LC_{50}$ : 1800mg/L (96h)(Fish) | $EC_{50}$ : 40mg/L (48h)(Crustaceans) | No information available |
| **Hydrogen chloride** | $LC_{50}$ : 20.5mg/L (96h)(Fish) | No information available | No information available |

| | | | |
|---|---|---|---|
| **Cobalt** | $LC_{50}$ : 1.5mg/L (96h)(Fish) | No information available | No information available |
| **Copper** | $LC_{50}$ : 0.665mg/L (96h)(Fish) | $EC_{50}$ : 0.02mg/L (48h)(Crustaceans) | $ErC_{50}$ : 7.9mg/L (96h)(Algae) |
| **Cadmium** | $LC_{50}$ : 7.8mg/L (96h)(Fish) | $EC_{50}$ : 0.58mg/L (48h)(Crustaceans) | No information available |
| **Vanadium** | $LC_{50}$ : 0.693mg/L (96h)(Fish) | No information available | No information available |
| **Arsenic** | $LC_{50}$ : 12.6mg/L (96h)(Fish) | No information available | $ErC_{50}$ : 25.2mg/L (72h)(Algae) |
| **Zinc** | $LC_{50}$ : 2.01mg/L (96h)(Fish) | $EC_{50}$ : 1.33mg/L (48h)(Crustaceans) | No information available |
| **Molybdenum** | $LC_{50}$ : 609.1mg/L (96h)(Fish) | No information available | No information available |
| **Lead** | $LC_{50}$ : 2.8mg/L (96h)(Fish) | No information available | No information available |
| **Chromium** | $LC_{50}$ : 40.5mg/L (96h)(Fish) | $EC_{50}$ : 0.07mg/L (48h)(Crustaceans) | No information available |
| **Nickel** | $LC_{50}$ : 40mg/L (96h)(Fish) | $EC_{50}$ : 1mg/L (48h)(Crustaceans) | No information available |

### Chronic aquatic toxicity

| | |
|---|---|
| **Chronic aquatic toxicity** | No information available |

### Persistence and degradability

| Component | Persistence (water/soil) | Persistence (air) |
|---|---|---|
| **Nickel** | Low | Low |

### Bioaccumulative potential

| Component | Bioaccumulative potential | Comments |
|---|---|---|
| **Nickel** | Low | Log Kow=-1.38 |

### Mobility in soil

| Component | log Koc | Remark |
|---|---|---|
| **Nickel** | 1.155 | |

## 13 Disposal considerations

### Disposal considerations

| | |
|---|---|
| **Waste chemicals** | Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal. |
| **Contaminated packaging** | Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible. |
| **Disposal recommendations** | Refer to section waste chemicals and contaminated packaging. |

## 14 Transport information

### Label and Mark

| | |
|---|---|
| **Transporting Label** | Not applicable |

### IMDG-CODE

| | |
|---|---|
| IMDG-CODE | NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS |

### IATA-DGR

| | |
|---|---|
| IATA-DGR | NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS |

### UN-ADR

| | |
|---|---|
| UN-ADR | NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS |

### Transport in bulk according to IMO instruments

◆Transport in bulk according to Annex II of MARPOL and the IBC code

Not Available

◆Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Not Available

◆Transport in bulk in accordance with the IGC Code

Not Available

### Others

| | |
|---|---|
| Precautions for transport | Transport vehicles should be equipped with the appropriate variety and quantity of fire equipment and emergency equipment leakage during transport. Before transport, should be preceded by checking whether container integrity, sealing. The transport unit must be placarded and marked in accordance with relevant transporting requirements. |

## 15 Regulatory information

### International chemical inventory

| Component | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Cadmium | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Cobalt | √ | √ | √ | √ | √ | √ | √ | √ | × | √ | √ | √ | √ |
| Chromium | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Copper | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Manganese | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Molybdenum | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Nickel | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Lead | √ | √ | √ | √ | √ | √ | √ | √ | × | √ | √ | √ | √ |
| Antimony | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Vanadium | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Zinc | √ | √ | √ | √ | √ | √ | √ | √ | × | √ | √ | √ | √ |
| Hydrogen chloride | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Nitric acid | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Water | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

【A】 China Inventory of Existing Chemical Substances(IECSC)

【B】 European Inventory of Existing Commercial Chemical Substances(EC inventory)
【C】 United States Toxic Substances Control Act Inventory(TSCA)
【D】 Canadian Domestic Substances List(DSL)
【E】 New Zealand Inventory of Chemicals(NZIoC)
【F】 Philippines Inventory of Chemicals and Chemical Substances(PICCS)
【G】 Korea Existing Chemicals Inventory(KECL)
【H】 Australian. Inventory of Industrial Chemical (AIICS)
【I】 Japan Inventory of Existing & New Chemical Substances(ENCS)
【J】 Thailand Existing Chemicals Inventory(TECI)
【K】 Mexico National Inventory of Chemical Substances (INSQ)
【L】 Russia Inventory of Existing Substances (DRAFT)
【M】 Inventory of Existing Chemical Substances in Taiwan, China (TCSI)

## List of Chemical Substances under International Conventions

| Component | A | B | C |
|---|---|---|---|
| Arsenic | × | × | × |
| Cadmium | × | × | × |
| Cobalt | × | × | × |
| Chromium | × | × | × |
| Copper | × | × | × |
| Manganese | × | × | × |
| Molybdenum | × | × | × |
| Nickel | × | × | × |
| Lead | × | × | × |
| Antimony | × | × | × |
| Vanadium | × | × | × |
| Zinc | × | × | × |
| Hydrogen chloride | × | × | × |
| Nitric acid | × | × | × |
| Water | × | × | × |

【A】 The Montreal Protocol on Substances that Deplete the Ozone Layer
【B】 Stockholm Convention on Persistent Organic Pollutants (POPs)
【C】 Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade

## US chemical inventory

| Component | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| Arsenic | √ | × | √ | √ | √ | √ | √ | × |
| Cadmium | √ | × | √ | √ | √ | √ | √ | × |
| Cobalt | √ | √ | × | √ | √ | √ | √ | √ |
| Chromium | √ | × | √ | √ | √ | √ | √ | × |
| Copper | × | × | √ | √ | √ | √ | √ | × |
| Manganese | √ | × | × | √ | √ | √ | √ | × |
| Molybdenum | × | × | × | √ | √ | √ | √ | × |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Nickel** | √ | √ | √ | √ | √ | √ | √ | √ |
| **Lead** | √ | × | √ | √ | √ | √ | √ | × |
| **Antimony** | √ | × | √ | √ | √ | √ | √ | × |
| **Vanadium** | × | × | × | √ | √ | √ | √ | × |
| **Zinc** | × | × | √ | √ | √ | √ | √ | × |
| **Hydrogen chloride** | √ | √ | √ | √ | √ | √ | √ | × |
| **Nitric acid** | × | √ | √ | √ | √ | √ | √ | × |
| **Water** | × | × | × | × | × | × | × | × |

[A] US Clean Air Act (CAA)- Section 112, Hazardous Air Pollutants
[B] US SARA 302- Extremely Hazardous Substance List
[C] US CERCLA- Hazardous Substances List
[D] US Massachusetts Right-to-Know Substance List
[E] US New Jersey Right to Know Hazardous Substance List
[F] US Pennsylvania Right to Know Hazardous Substance List
[G] US New York City Right-to-Know Hazardous Substance List
[H] US California Proposition 65 List

Note:
"√" Indicates that the substance included in the regulations.
"×" No data or not included in the regulations.

## 16 Other information

### Information on revision

| | |
|---|---|
| Creation Date | 2025/10/21 |
| Revision Date | - |
| Reason for revision | - |

### Reference

[1] IPCS: The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home.
[2] IARC, website: http://www.iarc.fr/.
[3] OECD: The Global Portal to Information on Chemical Substances, website: https://www.echemportal.org/echemportal/.
[4] CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple.
[5] NLM: ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp.
[6] EPA: Integrated Risk Information System, website: http://cfpub.epa.gov/iris/.
[7] U.S. Department of Transportation: ERG, website: http://www.phmsa.dot.gov/hazmat/library/erg.
[8] Germany GESTIS-database on hazard substance, website: http://gestis-en.itrust.de/.

### Abbreviations and acronyms

| | | | |
|---|---|---|---|
| CAS | Chemical Abstracts Service | UN | The United Nations |
| PC-STEL | Short term exposure limit | OECD | Organization for Economic Co-operation and Development |
| PC-TWA | Time Weighted Average | IMDG-CODE | International Maritime Dangerous Goods CODE |
| MAC | Maximum Allowable Concentration | IARC | International Agency for Research on Cancer |
| DNEL | Derived No Effect Level | ICAO | International Civil Aviation Organization |
| PNEC | Predicted No Effect Concentration | IATA | International Air Transportation Association |
| NOEC | No Observed Effect Concentration | ACGIH | American Conference of Governmental Industrial Hygienists |
| $LC_{50}$ | Lethal Concentration 50% | NFPA | National Fire Protection Association |
| $LD_{50}$ | Lethal Dose 50% | NTP | National Toxicology Program |
| $EC_{50}$ | Effective Concentration 50% | PBT | Persistent, Bioaccumulative, Toxic |
| $EC_X$ | Effective Concentration X% | vPvB | very Persistent, very Bioaccumulative |
| $P_{OW}$ | Partition coefficient Octanol: Water | CMR | Carcinogens, mutagens or substances toxic to reproduction |

| | | | |
|---|---|---|---|
| BCF | Bioconcentration factor | RPE | Respiratory Protective Equipment |
| ED | Endocrine disruptor | HCS | Hazard Communication Standard |

## Disclaimer

This Safety Data Sheet (SDS) was prepared according to OSHA HCS-2024. The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.