

## Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

### Product Identifier:

**Identification as on the label/Trade name:** Ytterbium Metal.

**Molecular weight:** 173.04

**Chemical formula:** Yb

**Synonyms:** None.

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

Neonest AB  
Storgatan 70C, Solna  
SE-17152  
Sweden

### Contact details:

+46-76-219-9731

### 24-hour Emergency Contact:

Swedish Poisons Centre  
Phone: 112 - Ask for Poisons Information, 112 – begär Giftinformation.

### Other International Contacts:

CHEMTREC 24-hour: +1-703-741-5500 (US + Worldwide)  
NHS: 111 (UK)  
Charite: +49 30 450 531 000 (Netherlands)  
INTCF: +34 917689800 (Spain)  
CapTv: +33 1 40 05 48 48 (France)

## Section 2: Hazards Identification

### Classification of the substances or mixture:

**The mixture is classified according to:** Regulation EC 1272/2008 [EU-GHS/CLP]

### **Hazard classes/Hazard categories:**

Flammable Solid (Category 1)  
Acute Toxicity, Oral (Category 4)  
Acute Toxicity, Dermal (Category 4)  
Skin Irritant (Category 2)  
Eye Irritant (Category 2)  
Acute Toxicity, Inhalation (Category 4)  
STOT SE (Category 3)

### **Hazard statement:**

H228  
H302  
H312  
H315  
H319  
H332  
H335

### Label elements:

**Hazard pictograms:**



**Signal Words:** Danger.

**Hazard Statements:**

- H228 Flammable solid.
- H302 Harmful if swallowed.
- H312 Harmful in contact with skin.
- H315 Causes skin irritation.
- H319 Causes serious eye irritation.
- H332 Harmful if inhaled.
- H335 May cause respiratory irritation.

**Precautionary Statements:**

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P264 Wash hands thoroughly after handling.
- Use only outdoors or in a well-ventilated area.
- P280 Wear protective gloves/eye protection.
- P302 + P352 IF ON SKIN: Wash with plenty water.
- P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P312 Call a POISON CENTER/doctor if you feel unwell.
- P332 + P313 If skin irritation occurs: Get medical advice/attention.
- P337 + P313 If eye irritation persists: Get medical advice/attention.
- P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
- P405 Store locked up.

**Other hazards:** None known.

### Section 3: Composition/Information on Ingredients

**Substance/Mixture:** Substance.

**Ingredients:**

Substance name (IUPAC/EC)	CAS-No.	Molecular weight	Concentration % by weight	Classification EC1272/2008	
	EC-No.				
Ytterbium	7440-64-4	173.04	>99%	Flam. Sol. 1	H228
	231-173-2			Acute Tox. 4	H302
Acute Tox. 4		H312			
Skin Irrit. 2		H315			
Eye Irrit. 2		H319			
				Acute Tox. 4	H332
				STOT SE 3	H335

For explanation of abbreviations see Section 16.

## Section 4: First-Aid Measures

### Description of first aid measures:

**In case of inhalation:** Remove to fresh air, keep warm and quiet, give oxygen if breathing is difficult. Seek medical attention.

**In case of skin contact:** Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention if symptoms persist.

**In case of eye contact:** Flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

**In case of ingestion:** Rinse mouth with water. Do not induce vomiting. Seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

### Most important symptoms and effects, both acute and delayed:

**Inhalation:** Inhalation of dusts may be damaging to the health of the individual. Material may cause respiratory irritation in some persons. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis may incur further disability if excessive concentrations of particulate are inhaled.

**Eyes:** Material can cause eye irritation and damage in some persons. Contact the eye by metal dusts may cause mechanical abrasion or foreign body penetration of the eyeball.

**Skin contact:** Not thought to produce adverse health effects following contact; however, open cuts, abraded or irritated skin should not be exposed to this material. Entry into the bloodstream through cuts, abrasions or lesions may produce systemic injury with harmful effects.

**Ingestion:** Not normally a hazard due to the physical form of the product. However, accidental ingestion of the material may be damaging to the health of the individual. Lanthanide poisoning causes immediate defecation, writhing, incoordination, laboured breathing, and inactivity. Respiratory and heart failure may follow, causing death.

**Indication of any immediate medical attention and special treatment needed:** Treat symptomatically. Show this safety data sheet to a physician or emergency room.

## Section 5: Fire-Fighting Measures

### Extinguisher media:

**Suitable extinguisher media:** Use Class D dry powder extinguishing agent.

**Unsuitable extinguishing media:** Water spray.

**Special hazards arising from the mixture:** Flammable in the form of dust when exposed to heat, spark or flame. May react with water under fire conditions liberating flammable hydrogen gas. May emit fumes of ytterbium oxide under fire conditions.

**Advice for fire-fighters:** Full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.

**Further information:** None.

## Section 6: Accidental Release Measures

### Personal precautions, protective equipment and emergency procedures:

**Personal precautions:** Wear appropriate respiratory and protective equipment specified in section 8. Isolate spill area and provide ventilation. Avoid breathing dust or fume. Avoid contact with skin and eyes. If conditions are dusty, eliminate all sources of ignition.

**Environmental precautions:** Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. Local authorities should be advised if significant spillages cannot be contained.

**Methods for containment and cleaning up:**

**Methods for cleaning up:** Avoid dust formation. Sweep or scoop spilled product and place in a closed container for further handling and disposal. Use only non-sparking tools and natural bristle brushes.

**Reference to other sections:**

Treat recovered material as described in the section "Disposal considerations".

## Section 7: Handling and Storage

**Precautions for safe handling:**

**Advice on safe handling:** Handle in an enclosed, controlled process, under dry protective gas such as argon when possible. Air- and moisture-sensitive. Use non-sparking tools. Protect from sources of ignition. Protect from water/moisture. Avoid contact with skin and eyes. Wash thoroughly before eating or smoking. See Section 8 for information on personal protection equipment.

**Hygiene measures:** Do not eat, drink or smoke when using this product.

**Conditions for safe storage, including incompatibilities:**

**Requirements for storage areas and containers:** Ytterbium metal should be stored in tightly-closed containers under argon or mineral oil. Store in a cool, dry area. Protect from water/moisture. See section 10 for more information on incompatible materials.

## Section 8: Exposure Controls/Personal Protection

**Control parameters:**

**Occupational exposure limits:** Contains no substances with occupational exposure limit values.

**Exposure controls:**

**Appropriate engineering controls:** Handle in a humidity-controlled atmosphere. Handle in an enclosed, controlled process when possible. Ensure adequate ventilation to maintain exposures below occupational limits. Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

**Individual protection measures, such as personal protective equipment:**

**Eye/face protection:** Chemical safety goggles.

**Hand protection:** Impermeable gloves.

**Body protection:** Protective work clothing as necessary.

**Respiratory protection:** If permissible levels are exceeded, use NIOSH-approved respirator.

## Section 9: Physical and Chemical Properties

### Information on basic physical and chemical properties

**Appearance (form):** Solid (powder).

**Colour:** Silver-grey.

**Odour:** No data available.

**Odour threshold:** No data available.

**Molecular Weight:** 173.04

**pH (concentration):** No data available.

**Melting point/range (°C):** 819 °C

**Boiling point/range (°C):** 1196 °C

**Freezing point (°C):** No data available.

**Flash point (°C):** No data available.

**Evaporation rate:** No data available.

**Flammability (solid, gas):** The substance is a flammable solid.

**Ignition temperature (°C):** No data available.

**Upper/lower flammability/explosive limits:** No data available.

**Vapour pressure (20 °C):** Negligible.

**Vapour density:** No data available.

**Relative density (25 °C):** 6.966 g/cm<sup>3</sup>

**Water solubility (g/L) at 20 °C:** Insoluble.

**n-Octanol/Water partition coefficient:** No data available.

**Auto-ignition temperature:** No data available.

**Decomposition temperature:** No data available.

**Viscosity, dynamic (mPa s):** No data available.

**Explosive properties:** The substance or mixture is not classified as explosive.

**Oxidising properties:** The substance or mixture is not classified as oxidizing.

## Section 10: Stability and Reactivity

**Reactivity:** No dangerous reaction known under conditions of normal use.

**Chemical stability:** Stable under normal conditions.

**Possibility of hazardous reactions:** None known.

**Conditions to avoid:** Avoid creating or accumulating fines or dusts, especially near possible ignition sources such as sparks or flame.

**Incompatible materials:** Acids, acid chlorides, oxidizing agents, halogens, water/moisture, air.

**Hazardous decomposition products:** Ytterbium oxides, ytterbium hydroxides, hydrogen.

## Section 11: Toxicological Information

### Information on toxicological effects:

#### **Acute Toxicity:**

Harmful if swallowed, in contact with skin, and inhaled.

#### **Classification according to GHS (1272/2008/EG, CLP)**

#### **Skin corrosion/irritation:**

Causes skin irritation.

**Serious eye damage/eye irritation:**

Causes serious eye irritation. Material can cause eye irritation and damage in some persons. Contact the eye by metal dusts may cause mechanical abrasion or foreign body penetration of the eyeball.

**Respiratory or skin sensitisation:**

Not classified based on available information.

**Germ cell mutagenicity:**

Not classified based on available information.

**Carcinogenicity:**

IARC: Not identified as carcinogenic.

NTP: Not identified as carcinogenic.

**Reproductive toxicity:**

Not classified based on available information.

**Specific target organ toxicity – single exposure (STOT):**

May cause respiratory irritation. Inhalation of dusts may be damaging to the health of the individual. Material may cause respiratory irritation in some persons. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis may incur further disability if excessive concentrations of particulate are inhaled.

**Specific target organ toxicity (STOT) – repeated exposure:**

Not classified based on available information.

**Aspiration toxicity:**

Not classified based on available information.

**Section 12: Ecological Information****Toxicity:**

**Atmospheric Fate:** Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

**Environmental Fate:** Environmental processes, such as oxidation, the presence of acids or bases and microbiological process, may transform insoluble materials to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.

**Aquatic/Terrestrial Fate:** When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further.

**Persistence and degradability:** No data available.

**Bioaccumulative potential:** No data available.

**Mobility in soil:** No data available.

**Results of PBT& vPvB assessment:** Not relevant.

**Other adverse effects:** Do not allow material to be released to the environment.

**Section 13: Disposal Considerations**

**Waste treatment methods:** Dispose of in accordance with local and national regulations. In some areas, certain wastes must be tracked.

**Section 14: Transport Information**

**DOT:**

**Proper Shipping Name:** METAL POWDER, FLAMMABLE, N.O.S.

**Hazard Class:** 4.1

**UN Number:** 3089

**Packing Group:** II

**Hazard Label:**



**IMDG:**

**Proper Shipping Name:** METAL POWDER, FLAMMABLE, N.O.S.

**Hazard Class:** 4.1

**UN Number:** 3089

**Packing Group:** II

**Marine Pollutant:** No

**IATA:**

**Proper Shipping Name:** METAL POWDER, FLAMMABLE, N.O.S.

**Hazard Class:** 4.1

**UN Number:** 3089

**Packing Group:** II

## Section 15: Regulatory Information

**EU regulations:**

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended**

Not listed.

**Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended**

Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry**

Not listed.

**Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA**

Not listed.

**Authorisations:**

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended**  
Not listed.

**Restrictions on use:**

**Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use**  
Not regulated.

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**  
Not listed.

**Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens and mutagens at work**  
Not regulated.

**Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding.**  
Not regulated.

**Other EU regulations:**

**Directive 2012/18/EU on major accident hazards involving dangerous substances**  
Not listed.

**Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.**  
Always applicable.

**Directive 94/33/EC on the protection of young people at work**  
Not listed.

**Other regulations:** The product is classified and labelled in accordance with EC directives or respective national laws. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

**TSCA Listed:** Ytterbium (7440-64-4) is listed in the US Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

**Regulation (EC) No 1272/2008 (CLP):** N/A

**Canada WHMIS (CPR, SOR/88-66):** N/A

**HMIS Ratings:** Health: 1 Flammability: 1 Physical: 1

**NFPA Ratings:** Health: 1 Flammability: 1 Instability: 1

**National regulations:** Follow national regulation for work with chemical agents.

**Chemical safety assessment:** No Chemical Safety Assessment has been carried out.

## Section 16: Other Information

**List of abbreviations:**

ACGIH American Conference of Governmental Industrial Hygienists

ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road

ALARA As Low As Is Reasonably Achievable

AMU Atomic Mass Unit

ANSI American National Standards Institute



BLS Basic Life Support  
CAM Continuous Air Monitor  
CAS Chemical Abstracts Service (division of the American Chemical Society)  
CEN European Committee for Standardization  
CERCLA Comprehensive Environmental Response Compensation and Liability Act  
CLP Classification, Labelling and Packaging (European Union)  
CPR Controlled Products Regulations (Canada)  
CWA Clean Water Act (USA)  
DAC Derived Air Concentration (USA)  
DOE United States Department of Energy (USA)  
DOT United States Department of Transportation (USA)  
DSL Domestic Substances List (Canada)  
EC50 Half Maximal Effective Concentration  
EINECS European Inventory of Existing Commercial Chemical Substances  
EHS Environmentally Hazardous Substance  
ELINCS European List of Notified Chemical Substances  
EMS Emergency Response Procedures for Ships Carrying Dangerous Goods  
EPA Environmental Protection Agency (USA)  
EPCRA Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986  
GHS Globally Harmonized System  
HMIS Hazardous Materials Identification System (USA)  
IARC International Agency for Research on Cancer  
IATA International Air Transport Association  
IBC Intermediate Bulk Containers  
ICAO International Civil Aviation Organization  
IDLH Immediately Dangerous to Life or Health  
IMDG International Maritime Code for Dangerous Goods  
LC50 Lethal concentration, 50 percent  
LD50 Lethal dose, 50 percent  
LDLO Lethal Dose Low  
LOEC Lowest-Observed-Effective Concentration  
MARPOL International Convention for the Prevention of Pollution from Ships  
MSHA Mine Safety and Health Administration (USA)  
NCRP National Council on Radiation Protection & Measurements (USA)  
NDSL Non-Domestic Substances List (Canada)  
NFPA National Fire Protection Association (USA)  
NIOSH National Institute for Occupational Safety and Health (USA)  
NOEC No Observed Effect Concentration  
N.O.S. Not Otherwise Specified  
NRC Nuclear Regulatory Commission (USA)  
NTP National Toxicology Program (USA)  
OSHA Occupational Safety and Health Administration (USA)  
PBT Persistent Bioaccumulative and Toxic Chemical  
PEL Permissible Exposure Limit  
PIH Poisonous by Inhalation Hazard  
RCRA Resource Conservation and Recovery Act (USA)  
RCT Radiation Control Technician

REACH Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe)  
RID Regulations Concerning the International Transport of Dangerous Goods by Rail  
RTECS Registry of Toxic Effects of Chemical Substances  
SARA Superfund Amendments and Reauthorization Act (USA)  
TDG Transportation of Dangerous Goods (Canada)  
TIH Toxic by Inhalation Hazard  
TLV Threshold Limit Value  
TPQ Threshold Planning Quantity  
TSCA Toxic Substances Control Act  
TWA Time Weighted Average  
UN United Nations (Number)  
VOC Volatile Organic Compound  
vPvB Very Persistent Very Bioaccumulative Chemical  
WGK Wassergefährdungsklassen (Germany: Water Hazard Classes)  
WHMIS Workplace Hazardous Materials Information System

**References:**

Not available.

**Full text of any H-statements not written out in full under Sections 2 to 15:**

H228 Flammable solid.  
H302 Harmful if swallowed.  
H312 Harmful in contact with skin.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H332 Harmful if inhaled.  
H335 May cause respiratory irritation.

**Revision information:**

None.

**Training information:**

Follow training instructions when handling this material.

**Further Information:**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.