

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Ytterbium Metal
Chemical Formula	Yb
Molecular Weight	173.04 g/mol
CAS No.	7440-64-4
Supplier Address*	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number (supplier and manufacturer)	Infotrac / +1 800-535-5053 *May include subsidiaries or affiliate companies/divisions
Email	iusa@isoflex.com
Website	www.isoflex.com
Preparation Information	ISOFLEX USA Product Safety +1 415-440-4433

2. HAZARDS IDENTIFICATION

Emergency Overview:

NFPA Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 1 Flammability = 1 Reactivity = 1



Emits flammable gases with water.

HMIS Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 0 Flammability = 1 Physical Hazard = 1

HEALTH HAZARD	0
FLAMMABILITY	1
PHYSICAL HAZARD	1

GHS Label Elements:



Hazard Statements:

H228	Flammable solid
H261	In contact with water releases flammable gas

Precautionary Statements:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P231+P232	Handle under inert gas. Protect from moisture.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P223	Do not allow contact with water.
P335+P334	Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.
P370+P378	In case of fire: Use extinguishing media suitable for surrounding materials.
P402+P404	Store in a dry place. Store in a closed container.
P501	Dispose of contents/container to authorized chemical landfill or if organic to high-temperature incineration.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<i>Chemical Name:</i>	Ytterbium
<i>CAS No.:</i>	7440-64-4
<i>Chemical Formula:</i>	Yb
<i>Molecular Weight:</i>	173.04 g/mol

4. FIRST AID MEASURES

<i>General Measures</i>	Under normal handling and use, exposure to solid forms of this material present few health hazards. Subsequent operations such as grinding, melting or welding may create dusts or fumes which could be inhaled or contact skin or eyes.
<i>Oral Exposure</i>	Rinse mouth with water. Do not induce vomiting. Seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.
<i>Inhalation Exposure</i>	Remove to fresh air, keep warm and quiet, give oxygen if breathing is difficult. Seek medical attention.
<i>Dermal Exposure</i>	Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention if symptoms persist.
<i>Eye Exposure</i>	Flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

5. FIREFIGHTING MEASURES

<i>Suitable Extinguishing Media</i>	Use Class D dry powder extinguishing agent.
<i>Unsuitable Extinguishing Media</i>	Do not use water.

Firefighting

<i>Protective Equipment</i>	Full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.
<i>Specific Hazard(s)</i>	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.

6. ACCIDENTAL RELEASE MEASURES

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

Do not allow to enter drains or to be released to the environment.

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.

7. HANDLING AND STORAGE

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.

Storage

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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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.

Personal Protective Equipment

Respiratory

If permissible levels are exceeded, use NIOSH-approved respirator

Hand

Impermeable gloves

Eye

Chemical safety goggles

Body

Protective work clothing as necessary

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical State

Solid in various forms

Form

Solid in various forms

Color

Odor

Odor Threshold

	Silver-gray
metallic	Not determined
	Not determined



Safety Data

Molecular Weight:	173.04 g/mol	pH:	N/A
BP/BP Range:	1196 °C	MP/MP Range:	819 °C
Freezing Point:	N/A	Vapor Pressure:	Negligible
Vapor Density:	N/A	SG/Density:	6.966 g/cm ³
VOC Content:	N/A	Water Content:	N/A
Solvent Content:	N/A	Evaporation Rate:	N/A
Viscosity:	N/A	Surface Tension:	N/A
Partition Coefficient:	N/A	Decomposition Temperature:	N/A
Flash Point:	N/A	Explosion Limits:	N/A
Flammability:	No data	Autoignition Temperature:	No data
Miscellaneous Data:	N/A	Solubility:	Insoluble - Reacts

10. STABILITY AND REACTIVITY

<i>Reactivity</i>	No data
<i>Stability</i>	Stable under recommended storage conditions
<i>Conditions to Avoid</i>	Avoid creating or accumulating fines or dusts, especially near possible ignition sources such as sparks or flame.
<i>Materials to Avoid</i>	Acids, acid chlorides, oxidizing agents, halogens, water/moisture, air
<i>Hazardous Decomposition Products</i>	Ytterbium oxides, ytterbium hydroxides, hydrogen
<i>Hazardous Polymerization</i>	Will not occur

11. TOXICOLOGICAL INFORMATION

<i>Signs and Symptoms of Exposure</i>	To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated. Symptoms of exposure may include irritation.
Acute Toxicity	
<i>Skin Damage</i>	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.
<i>Serious Eye</i>	Material can cause eye irritation and damage in some persons. Contact
<i>Damage/Eye Irritation</i>	with the eye by metal dusts may cause mechanical abrasion or foreign body penetration of the eyeball.
<i>Respiratory Damage or Sensitization</i>	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.
<i>Ingestion Risks</i>	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, labored breathing, and inactivity. Respiratory and heart failure may follow, causing death.
Carcinogenicity	
<i>IARC</i>	Not identified as carcinogenic
<i>NTP</i>	Not identified as carcinogenic
<i>Reproductive Toxicity</i>	No data available

<i>Specific target organ toxicity - single exposure</i>	Inhalation - may cause respiratory irritation
<i>Specific target organ toxicity - repeated exposure</i>	No data available
<i>Aspiration Hazard</i>	No data available

12. ECOLOGICAL INFORMATION

Toxicity for Metal:

Atmospheric Fate:

Metal-containing inorganic substances generally have negligible vapor 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 forma. 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 (Water/Soil/Air)

No data available

Bioaccumulative Potential

No data available

Mobility in Soil

No data available

Other Adverse Effects

Do not allow material to be released to the environment. No further relevant information available.

13. DISPOSAL CONSIDERATIONS

Product

Dispose of in accordance with federal, state and local regulations. In some areas, certain wastes must be tracked.

Contaminated Packaging

Dispose of in accordance with federal, state and local regulations. In some areas, certain wastes must be tracked.

14. TRANSPORT INFORMATION

DOT

Non-Hazardous for Land Transport

ICAO / IATA / DGR

Non-Hazardous for Air Transport

IMDG Code / GGVSee

Non-Hazardous for Sea Transport

UN Number:

N/A

UN Proper Shipping Name:

N/A

Transport Hazard Class:

N/A

Packing Group:

N/A

Marine Pollutant:

No

Contact ISOFLEX for other transportation information.

15. REGULATORY INFORMATION

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
Chemical Safety Assessment:	A chemical safety assessment has not been carried out.

16. OTHER INFORMATION

Prepared By	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
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Revision Number	3
Revision Note	Update supplier address

ISOFLEX USA's Commonly Used Abbreviations and Acronyms*

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
AICS	Australian Inventory of Chemical Substances
ALARA	As Low As Is Reasonably Achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
BLS	Basic Life Support
BOD5	Biochemical Oxygen Demand
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)
COD	Chemical Oxygen Demand
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
ECL	Korean Existing Chemicals List
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
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
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
PICCS	Philippines Inventory of Chemicals and Chemical Substances
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
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act (USA)
SNUR	Significant New Use Rule (TSCA)
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

*One or more of the above-listed items may not appear in this document.

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