

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Osmium, Enriched Osmium
Chemical Formula	Os
Molecular Weight	39.95
CAS No.	7440-04-2
SARA 313	No
RTECS No.	RN1100000
Synonyms	Metallic Osmium
Supplier Address*	ISO FLEX USA PO Box 29475 San Francisco CA 94129 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number (both 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	ISO FLEX USA Product Safety +1 415-440-4433

2. HAZARDS IDENTIFICATION

Emergency Overview

Flammable (USA) Highly Flammable (EU). Irritant.
Risk of serious damage to eyes.

Effects of Exposure

Osmium is considered poisonous and should be handled with caution. Effects include ocular disturbances, respiratory difficulties, heavy metal poisoning.

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

Health Hazard = 2 Flammability = 4 Reactivity = 1



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

Health Hazard = 2 Flammability = 4 Physical Hazard = 1

HEALTH HAZARD	2
FLAMMABILITY	4
PHYSICAL HAZARD	1

For additional information on toxicity, please refer to Section 10.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Osmium, Enriched Osmium
Chemical Formula	Os
Molecular Weight	39.95
CAS No.	7440-04-2

4. FIRST AID MEASURES

<i>Ingestion</i>	If swallowed, wash out mouth with water, provided person is conscious. Call a physician.
<i>Inhalation</i>	If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.
<i>Dermal Exposure</i>	In case of contact, immediately wash skin with soap and copious amounts of water.
<i>Eye Exposure</i>	Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water.
<i>Notes to Physician</i>	Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water.

5. FIREFIGHTING MEASURES

<i>Flash Point</i>	Not available
<i>Autoignition Temperature</i>	Not available
<i>Suitable Extinguishing Media</i>	Flammable solid. If involved in a fire, do not use water, carbon dioxide or halogenated extinguishers. Use dry chemical extinguishing agents, dry sand or dry ground dolomite.

Firefighting

<i>Protective Equipment</i>	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
<i>Specific Hazards</i>	Flammable solid. Emits toxic fumes under fire conditions.

6. ACCIDENTAL RELEASE MEASURES

<i>In Case of Leak or Spill</i>	Evacuate area. Cover spill with dry sand or vermiculite. Mix well and carefully transfer to a container.
<i>Personal Precautions</i>	Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
<i>Methods for Cleaning Up</i>	Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

<i>Handling</i>	Avoid contact and inhalation.
<i>Storage</i>	Keep tightly closed. Keep away from heat, sparks and open flame. Store in a cool, dry place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<i>Engineering Controls</i>	Use only in a chemical fume hood. Provide safety shower and eye bath.
Personal Protective Equipment	
<i>Skin and Body</i>	Wear appropriate government-approved respirator, chemical-resistant gloves, safety goggles and other protective clothing.
<i>Hygiene Measures</i>	Wash thoroughly after handling. Discard contaminated clothing and shoes.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Form	Bluish-white metal
Odor	No odor
Safety Data	
Molecular Weight:	190.2 amu
Boiling Point:	5027 °C
Melting Point:	3045 °C
Vapor Density:	N/A
Vapor Pressure:	Essentially 0
Specific Gravity:	22.6 gm/cc
% Volatiles:	0
Solubility in H ₂ O:	Insoluble

10. STABILITY AND REACTIVITY

<i>Chemical Stability</i>	Stable
<i>Conditions to Avoid</i>	Extreme heat
<i>Incompatible Materials</i>	ClF ₃ , OF ₂ , halogens, phosphorus, oxygen, oxidizers, acids, organic solvents, NH ₄
<i>Hazardous Decomposition Products</i>	Oxides of osmium. Osmium dust reacts violently with ClF ₃ and OF ₂ . On heating in air, it gives off poisonous fumes of osmium tetroxide.
<i>Hazardous Polymerization</i>	Will not occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure	
<i>Skin Contact</i>	Causes skin irritation
<i>Eye Contact</i>	Causes severe eye irritation
<i>Inhalation</i>	Material is irritating to mucous membranes and upper respiratory tract
<i>Multiple Routes</i>	May be harmful by inhalation, ingestion, or skin absorption
Sensitization	
<i>Skin</i>	Causes dermatitis

Acute Effects

<i>Inhalation</i>	Irritating to mucous membranes and upper respiratory tract; may cause asthmatic condition, bronchitis.
<i>Ingestion</i>	May cause gastrointestinal irritation; no other effects known
<i>Skin</i>	Causes irritation, dermatitis, ulceration of the skin
<i>Eye</i>	Causes severe eye irritation, ocular disturbances, conjunctivitis; may cause blindness

Chronic Effects

<i>Inhalation</i>	Bronchitis
<i>Ingestion</i>	None known
<i>Skin</i>	Dermatitis
<i>Eye</i>	May cause blindness

Other Health Hazards

<i>Adverse Health Effects</i>	Mainly due to OsO4
<i>Most Likely Routes of Entry</i>	Ingestion
<i>Target Organs</i>	May cause kidney damage; route of overexposure not known
<i>Medical Conditions Generally Aggravated by Exposure</i>	None known

Carcinogenicity

<i>NTP</i>	No
<i>IARC</i>	No
<i>OSHA</i>	No
<i>EPA</i>	No

12. ECOLOGICAL INFORMATION

<i>Toxicity</i>	No data available
<i>Persistence and Degradability</i>	No data available
<i>Bioaccumulative Potential</i>	No data available
<i>Mobility in Soil</i>	No data available
<i>PBT and vPvB Assessment</i>	Not available, as chemical safety assessment not required/not conducted
<i>Other Adverse Effects</i>	No data available

13. DISPOSAL CONSIDERATIONS

<i>Product</i>	Material in the elemental state should be recovered for reuse or recycling. Observe all federal, state and local environmental regulations.
----------------	---

14. TRANSPORT INFORMATION**DOT**

<i>Proper Shipping Name</i>	Metal powders, flammable, n.o.s.
<i>UN No.</i>	3089
<i>Class</i>	4.1
<i>Packing Group</i>	II
<i>Hazard Label</i>	Flammable solid
<i>PIH</i>	Not PIH

IATA

<i>Proper Shipping Name</i>	Metal powder, flammable, n.o.s.
<i>UN No.</i>	3089
<i>Hazard Class</i>	4.1
<i>Packing Group</i>	II

15. REGULATORY INFORMATION

SARA 302 Components	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302
SARA 313 Components	This material does not contain any chemical components with known CAS numbers that exceed the threshold (de minimis) reporting levels established by SARA Title III, Section 313.
SARA 311/312 Hazards	Fire Hazard, Acute Health Hazards
Massachusetts Right to Know Components	No components are subject to the Massachusetts Right to Know Act.
Pennsylvania Right to Know Components	CAS No. 7440-04-2
New Jersey Right to Know Components	CAS No. 7440-04-2
California Prop. 65 Components	This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

<i>Prepared By</i>	ISOFLEX USA PO Box 29475 San Francisco CA 94129 United States
<i>Issuing Date</i>	September 15, 2014
<i>Revision Date</i>	August 1, 2021
<i>Revision Number</i>	3
<i>Revision Note</i>	Required review and update

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
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	Wassergefährungsklassen (Germany: Water Hazard Classes)
WHMIS	Workplace Hazardous Materials Information System

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

General Disclaimer

For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between ISOFLEX USA (or any of its affiliates and subsidiaries) and the purchaser.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. ISOFLEX shall not be held liable for any damage resulting from handling or from contact with the above product.

