

1. PRODUCT AND COMPANY IDENTIFICATION

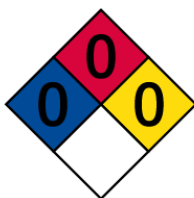
Product Name	Tungsten Oxide, Enriched Tungsten
CAS No.	1314-35-8
Chemical Formula	WO ₃
Molecular Weight	231.85 amu
RTECS Number	YO7760000
Synonyms	C.I. 77901; Tungsten Blue; Tungsten trioxide; Tungstic acid; Tungstic anhydride; Tungstic oxide
Supplier Address*	ISO FLEX USA PO Box 29475 San Francisco 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: Harmful. Harmful if swallowed. Irritating to eyes, respiratory system and skin.
Target organ(s): Lungs.

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

Health Hazard = 0 Flammability = 0 Reactivity = 0



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

Health Hazard = 0 Flammability = 0 Physical Hazard = 0

HEALTH HAZARD	0
FLAMMABILITY	0
PHYSICAL HAZARD	0

Potential Health Effects

<i>Skin Contact</i>	Causes skin irritation
<i>Skin Absorption</i>	May be harmful if absorbed through the skin
<i>Eye Contact</i>	Causes eye irritation
<i>Inhalation</i>	Material is irritating to mucous membranes and upper respiratory tract; may be harmful if inhaled
<i>Ingestion</i>	Harmful if swallowed

For additional information on toxicity, please refer to Section 11.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name:	Tungsten Oxide
CAS No.	1314-35-8
Chemical Formula:	WO ₃
Molecular Weight:	231.85 amu

4. FIRST AID MEASURES

<i>Oral Exposure</i>	If swallowed, wash out mouth with water, provided person is conscious. Call a physician.
<i>Inhalation Exposure</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 skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.
<i>Eye Exposure</i>	In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

5. FIREFIGHTING MEASURES

<i>Flash Point</i>	Not available
<i>Autoignition Temperature</i>	Not available
<i>Flammability</i>	Not available
<i>Suitable Extinguishing Media</i>	Water spray; carbon dioxide, dry chemical powder, or appropriate foam

Firefighting

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

6. ACCIDENTAL RELEASE MEASURES

<i>Personal Precautions</i>	Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves. Avoid raising dust.
<i>Environmental Precautions</i>	No special environmental precautions required
<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>	Do not breathe dust. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Provide appropriate exhaust ventilation at places where dust is formed.
<i>Storage</i>	Keep tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls Safety shower and eye bath. Mechanical exhaust required.

Exposure Limits - RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	5 mg(W)/m ³
		STEL	10 mg(W)/m ³
USA	MSHA Standard-air	TWA	5 mg(W)/m ³
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	5 mg(W)/m ³
		STEL	10 mg/m ³

Personal Protective Equipment

<i>Respiratory</i>	Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate, use a dust mask type N95 (US) or type P1 (EN 143) respirator.
<i>Hand</i>	Compatible chemical-resistant gloves
<i>Eye</i>	Chemical safety goggles
<i>General Hygiene Measures</i>	Wash thoroughly after handling

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical State	Solid
Form	Powder
Color	Light yellow

Safety Data

Molecular Weight:	231.85 amu	Solubility:	N/A
pH:	6.1	Concentration:	100 g/l
BP/BP Range:	N/A	MP/MP Range:	1470.0-1475.0 °C
Freezing Point:	N/A	Vapor Pressure:	N/A
Vapor Density:	N/A	Saturated Vapor Concentration:	N/A
SG/Density:	7.16 g/cm ³	Bulk Density:	300.0-2800.0 kg/l
Odor Threshold:	N/A	Volatile%:	N/A
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
Flammability: N/A
Refractive Index: N/A
Miscellaneous Data: N/A

Explosion Limits: N/A
Autoignition Temperature: N/A
Optical Rotation: N/A

N/A = not available

10. STABILITY AND REACTIVITY

<i>Stability</i>	Stable
<i>Materials to Avoid</i>	Strong acids
<i>Hazardous Decomposition Products</i>	Tungsten oxide
<i>Hazardous Polymerization</i>	Will not occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure

<i>Skin Contact</i>	Causes skin irritation
<i>Skin Absorption</i>	May be harmful if absorbed through the skin
<i>Eye Contact</i>	Causes eye irritation
<i>Inhalation</i>	Material is irritating to mucous membranes and upper respiratory tract; may be harmful if inhaled
<i>Ingestion</i>	Harmful if swallowed
<i>Target Organ(s) or System(s)</i>	Lungs
<i>Signs and Symptoms of Exposure</i>	To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Toxicity Data

Oral LD50 (Rat) 1059 mg/kg

Remarks: Behavioral: Muscle weakness. Behavioral: Somnolence (general depressed activity). Behavioral: Excitement.

Carcinogenicity

<i>IARC</i>	No component of this product present at levels greater than or equal to 0.1% is identified as a probable, possible or confirmed human carcinogen by IARC.
<i>ACGIH</i>	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
<i>NTP</i>	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
<i>OSHA</i>	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

12. ECOLOGICAL INFORMATION

Toxicity

<i>Toxicity to Fish</i> (OECD Test Guideline 203)	Static test LC0 - <i>Danio rerio</i> (zebra fish) - \geq 5.25 mg/l - 96 h
<i>Toxicity to Daphnia and other Aquatic Invertebrates</i>	Immobilization EC0 - <i>Daphnia magna</i> (Water flea) - \geq 2.6 mg/l - 48 h (OECD Test Guideline 202)
<i>Toxicity to Algae</i>	Growth inhibition EC0 - <i>Desmodesmus subspicatus</i> (green algae) - \geq 1 mg/l - 72 h (OECD Test Guideline 201)
<i>Toxicity to Bacteria</i>	Respiration inhibition EC50 - Sludge Treatment - $>$ 10,000 mg/l - 3 h
<i>Persistence and Degradability</i>	No data available
<i>Bioaccumulative Potential</i>	No data available
<i>Mobility in Soil</i>	No data available
<i>Results of PBT and vPvB Assessment</i>	PBT/vPvB assessment not available, as chemical safety assessment not required/not conducted
<i>Other Adverse Effects</i>	No data available

13. DISPOSAL CONSIDERATIONS

<i>Product</i>	Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations.
<i>Contaminated Packaging</i>	Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT

<i>Proper Shipping Name</i>	None
<i>Non-Hazardous for Transport</i>	This substance is considered to be non-hazardous for transport.

IATA

<i>Non-Hazardous for Air Transport</i>	Non-hazardous for air transport.
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15. REGULATORY INFORMATION

EU Additional Classification

Symbol of Danger	Xn
Indication of Danger	Harmful.
R	22-36/37/38
Risk Statements	Harmful if swallowed. Irritating to eyes, respiratory system and skin.
S	26-36
Safety Statements	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.

US Classification and Label Text

Indication of Danger	Harmful
Risk Statements	Harmful if swallowed; irritating to eyes, respiratory system and skin
Safety Statements	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.
US Statements	Target organ(s): Lungs

United States Regulatory Information

SARA Listed	No
TSCA Inventory Item	Yes

Canada Regulatory Information

WHMIS Classification	This product has been classified in accordance with the hazard criteria of the CPR, and the SDS contains all the information required by the CPR.
DSL	Yes
NDSL	No

SARA 311/312 Hazards Chronic Health Hazard

Massachusetts Right to Know Components No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right to Know Components Tungsten trioxide

New Jersey Right to Know Components Tungsten trioxide / CAS No. 1314-35-8

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>	January 12, 2014
<i>Revision Date</i>	July 29, 2021
<i>Revision Number</i>	2
<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	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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