



SAFETY DATA SHEET

Section 1. Identification

Product Name:	Tungsten hexacarbonyl
Product Type:	Solid
CAS Number:	14040-11-0
Product Number:	W0110
Product Manufacturer:	Ereztech LLC 11555 Medlock Bridge Road, Suite 100 Johns Creek, GA 30097
Product Information:	(888) 658-1221
<u>In Case of an Emergency:</u>	CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International); CCN836180 *** Contact manufacturer for all non-emergency calls.

Section 2. Hazards Identification

Appearance/Odor:	White crystalline solid, odorless.
Classification:	Not classified.
<u>GHS Label Elements</u>	
Signal Word:	None.
Hazard Statements:	Not applicable.
Hazard Pictograms:	Not applicable.
<u>Precautionary Statements</u>	
Prevention:	Not applicable.
Response:	Not applicable.
Storage:	Not applicable.
Disposal:	Not applicable.
General:	None.
OSHA/HCS Status:	This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Hazards Not Otherwise Classified [HNOC]:	None known.

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Section 3. Composition/Information on Ingredients

Formula	: C ₆ O ₆ W
Molecular Weight	: 351.9 g/mol
CAS-No.	: 14040-11-0
Synonyms	: Tungsten carbonyl; (OC-6-11)-Tungstencarbonyl; (oc-6-11)-tungstencarbonyl(w(co)6; Hexacarbonylwolfram; Tungsten carbonyl (W(CO)6); Tungsten carbonyl (W(CO)6), (OC-6-11)-; Tungstencarbonyl(W(CO)6); Tungstencarbonyl(W(CO)6)

Ingredient Name	%	CAS Number
Tungsten hexacarbonyl	≥ 99	14040-11-0

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First Aid Measures

Description of Necessary First Aid Measures

- General Advice:** Move out of dangerous area. Call a POISON CENTER or doctor/physician immediately if symptoms develop or if you feel unwell. Show this safety data sheet to the doctor in attendance.
- Eye Contact:** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue rinsing. Call a physician or POISON CONTROL CENTER if eye irritation develops and persists.
- Skin Contact:** Take off contaminated clothing and shoes immediately. Wash off contaminated skin with soap and plenty of water. Call a physician or POISON CONTROL CENTER if irritation develops and persists, if symptoms develop or if you feel unwell.
- Inhalation:** Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a physician or POISON CONTROL CENTER if symptoms develop or if you feel unwell.
- Ingestion:** Rinse mouth. Do NOT induce vomiting. Remove dentures if any. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a physician or POISON CONTROL CENTER if symptoms develop or if you feel unwell.

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Section 4. First Aid Measures

Most Important Symptoms/Effects, Acute And Delayed Potential Acute Health Effects

- Eye Contact:** The acute eye contact symptoms of this product have not been determined.
- Inhalation:** Product may be harmful if inhaled and may cause respiratory irritation. The acute symptoms of inhalation of this product have not been determined.
- Skin Contact:** Product may be harmful in contact with skin and may cause skin irritation. The acute symptoms of dermal contact of this product have not been determined.
- Ingestion:** Product may be harmful if swallowed. The acute symptoms of ingestion of this product have not been determined.

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary

- Notes to Physician:** Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Tungsten carbonyl is reported to have a weakly fibrinogenic and general toxicity.
- Specific Treatments:** No specific treatment.
- Protection of First Responders:** No action taken shall be taken involving any personal risk without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See Toxicological Information (Section 11)

Section 5. Fire Fighting Measures

- General Hazards:** None known.
- Suitable Extinguishing Media:** Use water fog, water spray, dry chemical or carbon dioxide (CO₂). Fight larger fires with water stream or alcohol resistant foam.
- Unsuitable Extinguishing Media:** None identified.
- Unusual Fire and Explosion Hazards:** Unopened containers may become pressurized and rupture during a fire. Use water spray to cool unopened containers. Thermal decomposition can lead to the production of irritating and toxic gases and vapors.
- Product of Combustion:** Decomposition products include carbon monoxide, carbon dioxide and tungsten oxide fumes.
- Protection of Firefighters:** Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Avoid contact with skin or eyes. Avoid the formation and inhalation of dusts, aerosols, vapors and gases.

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Section 5. Fire Fighting Measures

Protection of Firefighters: Fire-fighters should wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in a positive pressure mode.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

For Non-Emergency Personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Prevent unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid the formation and inhalation of dusts, aerosols, vapors, and gases. Provide adequate ventilation. Wear respiratory protection. Put on appropriate personal protective equipment.

For Emergency Responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For Non-Emergency Personnel".

Environmental Precautions: Do not allow dispersal of spilled material and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for Containment

General: Move containers from spill area if safe to do so. Avoid the formation and inhalation of dusts and aerosols. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.

Small Spill: Contain and collect spillage with a dry, binding material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in a dry, sealed container for disposal according to local regulations (see Section 13).

Large Spill: Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with a dry binding material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in a dry, sealed container for disposal according to local regulations (see Section 13).

Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

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Section 7. Handling and Storage

Precautions:

Avoid formation and inhalation of dusts and aerosols. Keep away from incompatible materials. Keep container tightly sealed. Avoid contact with skin, eyes and clothing. Do not ingest. Avoid prolonged exposure. Ensure adequate ventilation.

Protective Measures:

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid the formation and inhalation of dusts, aerosols, vapors and gases. Keep in the original container kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

General Occupational Hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Safe Storage Conditions:

Store in original container protected from direct sunlight in a dry and well-ventilated area, away from incompatible materials and food and drink. Keep container tightly closed and sealed until ready for use. Store locked up.

Section 8. Exposure Controls/Personal Protection

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and conduct regular repairs. Waste from these procedures should be handled in accordance with Section 13.

Occupational Exposure Limits

List	Components	CAS-No.	Type	Value
ACGIH	Tungsten hexacarbonyl	14040-11-0	TLV	5.0 mg/m ³ as W TWA
			TLV	10.0 mg/m ³ as W STEL
NIOSH	Tungsten hexacarbonyl	14040-11-0	REL	5.0 mg/m ³ as W TWA
			REL	10.0 mg/m ³ as W ST

Engineering Controls:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Provide an eyewash/shower station.

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Section 8. Exposure Controls/Personal Protection

Environmental Exposure Controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual Protection Measures

Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Remove all soiled and contaminated clothing immediately. Avoid the formation and inhalation of dusts, aerosols, gases and vapors. Avoid contact with eyes and skin. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face Protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to dusts and aerosols. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles, faceshield (8-inch minimum). Refer to 29 CFR 1910.133, ANSI Z87.1, or European Standard EN166.

Skin Protection

Hand Protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical-resistant gloves.

Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product.

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Section 8. Exposure Controls/Personal Protection

Hand Protection (cont.):	Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Full contact material: Neoprene or nitrile rubber.
Other Skin Protection:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory Protection:	Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Section 9. Physical and Chemical Properties

Physical State:	Crystalline solid.
Color:	White.
Odor:	Odorless.
Odor Threshold:	No data available.
pH:	No data available.
Melting Point:	170 °C (338 °F) – decomposes [1].
Boiling Point:	175 °C (347 °F).
Flash Point:	200 °C (392 °F).
Auto-Ignition Temperature:	300 °C (572 °F).
Flammability:	No data available.
Relative Density:	2.65 g/cm ³ @ 20 °C (68 °F).
Vapor Pressure:	1.2 mm Hg @ 67 °C (152.6 °F).
Vapor Density:	12.1 @ 20 °C (68 °F).
Water Solubility:	Insoluble.
Evaporation Rate:	No data available.

Section 10. Stability and Reactivity

Reactivity:	No specific data available.
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Section 10. Stability and Reactivity

Chemical Stability:	Stable at normal ambient temperature and pressure and under recommended storage conditions.
Conditions to Avoid:	No additional information available.
Incompatible Materials:	Oxidizing agents.
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Product decomposes slowly in contact with moisture or water to produce carbon monoxide. Hazardous decomposition products formed under fire conditions: organic acid vapors, carbon oxides and tungsten oxide fumes. In the event of a fire: see section 5.
Possibility of Hazardous Reactions:	Under normal conditions of storage and use, hazardous reactions are not expected to occur. Hazardous reactions or instability may occur under certain conditions of storage or use.

Section 11. Toxicological Information

Information on Toxicological Effects

Acute Toxicity : No specific data available. Product may be harmful if ingested, inhaled and in contact with skin.

Product/Ingredient Name	Result	Species	Dose	Exposure
Tungsten hexacarbonyl	LD50 Oral	Rat	>5000 mg/kg	-

Irritation/Corrosion : No specific data available. Product may cause skin and eye irritation and may be harmful in contact with skin.

Sensitization : No specific data available.

Germ Cell Mutagenicity : No specific data available.

Carcinogenicity

IARC : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.

NTP : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

OSHA : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.

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Section 11. Toxicological Information

Reproductive Toxicity	: No specific data available.
Teratogenicity	: No specific data available.
Specific Target Organ Toxicity (Single Exposure)	: Product may be harmful if inhaled and may cause respiratory tract irritation.
Specific Target Organ Toxicity (Repeat Exposure)	: No specific data available.
Aspiration Hazard	: No specific data available.
Information on the Likely Routes of Exposure	: Common routes of exposure: inhalation (failure to prevent dust formation), dermal (failure to use skin protection), eye (failure to use safety eyewear). Less common: ingestion (failure to employ recommended hygiene measures (e.g. smoking after handling product without washing hands or using hand protection)).
Additional Information	: While no extended toxicity data is available, it is reasonable to assume that when exposed to moisture/water, tungsten carbonyl will generate carbon monoxide which complexes with hemoglobin. Tungsten carbonyl is reported to have a weakly fibrinogenic effect and general toxicity. To the best of our knowledge, the chemical, physical and toxicological properties of this product have not been thoroughly investigated.

Section 12. Ecological Information

Numerical Measures of Toxicity

Toxicity to Fish	: No specific data available.
Toxicity to Daphnia and Other Aquatic Invertebrates	: No specific data available.
Toxicity to Algae	: No specific data available.
Persistence and Degradability	
Biodegradability	: No specific data available.
Bioaccumulative Potential	: No specific data available.
Mobility in Soil	: Product is not expected to be mobile based on its low water solubility.
Other Adverse Effects	: This substance may be hazardous to the environment. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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Section 13. Disposal Considerations

Waste Treatment Methods

- Product:** Dispose of in accordance with local, state, and federal regulations. Refer to 40 CFR 260-299 for complete waste disposal regulations. Consult your local, state, or federal agency before disposing of any chemicals.
- Contaminated Packaging:** Empty containers retain product residue (dusts, aerosols, gases) and can be dangerous. Dispose of as unused product.

Section 14. Transport Information

	DOT	IMDG	IATA
UN Number	Not Regulated	Not Regulated	Not Regulated
UN Proper Shipping Name	-	-	-
Transport Hazard Classes	-	-	-
Packing Group	-	-	-
Environmental Hazards	-	-	-
Additional Information	-	-	-

Special Precautions for User : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transporting in Bulk According to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

Section 15. Regulatory Information

TSCA (Toxic Substance Control Act)

This product is listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory).

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

None identified.

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Section 15. Regulatory Information

Massachusetts Right to Know Components

Tungsten	CAS-No. 7440-33-7	Revision Date
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Pennsylvania Right to Know Components

Tungsten	CAS-No. 7440-33-7	Revision Date
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New Jersey Right to Know Components

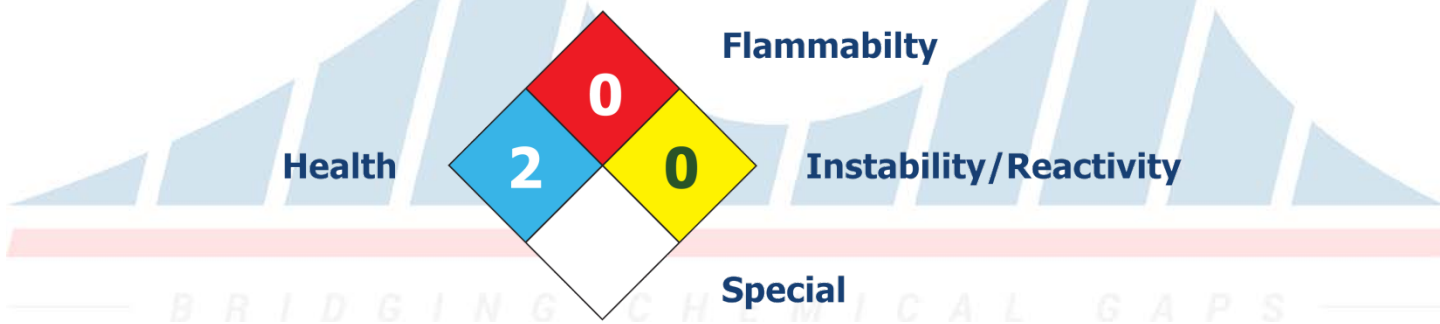
Tungsten	CAS-No. 7440-33-7	Revision Date
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California Proposition 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16. Other Information

National Fire Protection Association (U.S.A.)



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HMIS Rating

HEALTH	2
FLAMMABILITY	0
PHYSICAL HAZARD	0

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Section 16. Other Information

History

Date of Issue/Date of Revision : 1/10/2023

Date of Previous Issue : 3/11/2022

References

[1] Pradyot Patnaik, Ph.D. (2003), *Handbook of Inorganic Chemicals* (p 953).

Abbreviations and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists.

ATE: Acute Toxicity Estimate

CAS: Chemical Abstracts Service (division of the American Chemical Society).

DOT: US Department of Transportation.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

HMIS: Hazardous Materials Identification System.

HNOC: Hazards Not Otherwise Classified.

IARC: International Agency for Research on Cancer.

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA).

IDLH: Immediately Dangerous to Life or Health (US National Institute for Occupation Health and Safety (NIOSH)).

IMDG: International Maritime Code for Dangerous Goods.

NFPA: National Fire Protection Association.

NIOSH: National Institute of Occupational Safety and Health.

NTP: National Toxicology Program.

OEL: Occupational Exposure Limit.

OSHA: Occupational Safety and Health Administration.

PEL: Permissible Exposure Limits.

REL: Recommended Exposure Limits.

SARA: Superfund Amendments and Reauthorization Act.

STEL: Short Term Exposure Limit (ACGIH)

STOT: Specific Target Organ Toxicity.

TLV: Threshold Limit Values (ACGIH).

TWA: Time Weighted Average.

VOC: Volatile Organic Compound.

Disclaimer

The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by Ereztech LLC regarding the accuracy or completeness of the information. Ereztech LLC shall not be liable for any damages resulting from the handling, or from the contact with the above product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.