Material Safety Data Sheet

1. Product and Company Identification

Product name: Tungsten Hexafluoride
Chemical formula: F6W
Synonyms: Tungsten fluoride (WF6), (OC-6-11)-; (OC-6-11) Tungsten Fluoride (WF6); Tungsten fluoride (WF6); Wolfram Hexafluoride; Hexafluorotungsten; Tungsten (6+) Fluoride; Tungsten Hexafluoride (WF6); Tungsten VI Fluoride; Tungsten fluoride; UN 2196

Company: Med Tech Gases, Inc.
20 Hall Street
Medford, MA 02155
Telephone: 800-FINE-GAS
Emergency: 800-424-9300

2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>% Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten hexafluoride</td>
<td>7783-82-6</td>
<td>100%</td>
</tr>
</tbody>
</table>

Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Tungsten compounds, n.o.s., Fluorides.

3. Hazards Identification

Emergency Overview
Containers may rupture or explode if exposed to heat. May ignite combustibles. Reacts violently with water to generate toxic and/or flammable gases. May cause respiratory tract burns, skin burns, eye burns, mucous membrane burns, tears.

Potential Health Effects
- Inhalation: Same as reported in digestion, asthma, dizziness, lung digestion.
- Eye contact: Burns, tearing.
- Skin contact: Absorption may occur, same as effects reported in short term ingestion.
- Ingestion: Burns, rash, nausea, diarrhea, stomach pain, difficulty breathing, irregular heartbeat, headache, tingling sensation, visual disturbances, dilated pupils, bluish skin color, paralysis, convulsions, coma.
- Chronic Health Hazard: Not available.

4. First Aid Measures

Eye contact: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.
Skin contact: Wash skin with soap and water for at least 15 minutes while removing
contaminated clothing and shoes. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

Ingestion: If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Notes to physician: For inhalation, consider oxygen. Avoid gastric lavage or emesis.

Antidote: Dimercaprol; calcium disodium edetate; calcium gluconate; intravenous; milk of magnesia.

5. Fire-Fighting Measures

Suitable extinguishing media: Carbon dioxide, regular dry chemical.
Specific hazards: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials. Containers may rupture or explode if exposed to heat.
Fire fighting: Do not get water inside container. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Keep unnecessary people away, isolate hazard area and deny entry. Use extinguishing agents appropriate for surrounding fire. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

6. Accidental Release Measures


Additional advice: None.

7. Handling and Storage

Handling: Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage: Store in accordance with all current regulations and standards. Store in a cool, dry place. Store in a well-ventilated area. Keep separated from incompatible substances. Do not puncture or burn containers, even when empty. Store below 52°C.

8. Exposure Controls / Personal Protection

Exposure limits:
- ACGIH: 2.5 mg/m³ TWA (as F)
- OSHA (final): 2.5 mg/m³ TWA as F
- OSHA (vacated): 2.5 mg/m³ TWA
Component Biological Limit Values
ACGIH: Fluorides in urine: 3 mg/g creatinine, prior to shift (B, Ns); Fluorides in urine: 10 mg/g creatinine, end of shift (B, Ns).

Engineering measures/Ventilation
Ensure compliance with applicable exposure limits. Provide local exhaust or process enclosure ventilation system.

Personal protective equipment
Respiratory protection: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. For unknown concentrations or Immediately Dangerous to Life or Health – Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Hand protection: Wear appropriate chemical resistant gloves.
Eye protection: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body protection: Wear appropriate chemical resistant clothing.

9. Physical and Chemical Properties
Form: Gas liquid.
Color: Colorless or yellow.
Odor: Odorless.
Molecular weight: 297.84
Vapor density: 10.6 (air = 1)
Vapor pressure: 863 mmHg @ 21°C
Boiling point: 18 – 20°C
Melting point: 2 – 3°C
Water solubility: Decomposes, reacts.
Solvent solubility: Soluble: alkali, carbon disulfide, hydrogen fluoride.

10. Stability and Reactivity
Stability: Reacts violently with water to generate toxic and/or flammable gases.
Conditions to avoid: Minimize contact with material. Avoid inhalation of material or combustion by-products. Containers may rupture or explode if exposed to heat.
Materials to avoid: Combustible materials, reducing agents, acids, metals.
Hazardous decomposition products: Thermal decomposition products: hydrogen fluoride.

11. Toxicological Information
The components of this material have been reviewed in various sources and no selected endpoints have been identified.
Acute Toxicity Level
TUNGSTEN HEXAFLUORIDE (7783-82-6) : Highly toxic: Inhalation.

Component Carcinogenicity
ACGIH : A4 – Not Classifiable as a Human Carcinogen.

Local Effects
TUNGSTEN HEXAFLUORIDE (7783-82-6) : Corrosive: Inhalation, skin, eye. Lacrimator: Eye.

Medical Conditions Aggravated by Exposure
Central nervous system disorders, bone, joint or tooth disorders, eye disorders, kidney disorders, respiratory disorders, skin disorders and allergies.

Additional Data
May cross the placenta. May be excreted in breast milk.

12. Ecological Information

No LOI ecotoxicity data are available for this product’s components.

13. Disposal Considerations

Contaminated packaging : Return cylinder to supplier.

14. Transport Information

DOT (US only)
Proper shipping name : Tungsten Hexafluoride
Class : 2.3
UN/ID No. : UN2196
Labeling : Poison Gas, Corrosive
Additional Info : Toxic-Inhalation Hazard Zone B

15. Regulatory Information

U.S. Federal Regulations
None of this product’s components are listed under SARA Section 302/304 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA 311/312
Acute: Yes
Chronic: Yes
Fire: Yes
Reactive: Yes
Pressure: Yes
U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
<th>RI</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUNGSTEN HEXAFLUORIDE</td>
<td>7783-82-6</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>(related to: Tungsten compounds, n.o.s.)</td>
<td>(related to: Fluorides)</td>
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Not regulated under California Proposition 65