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## Material Safety Data Sheet

Identity: Tungsten selenide

Formula: WSe<sub>2</sub>

### SECTION I - GENERAL INFORMATION

Manufacturer: Advanced Engineering Materials Limited (AEM)

The information below is believed to be accurate and represents the best information available to AEM. However, AEM makes no warranty, expressed or implied with respect to such information and assumes no liability resulting from its use.

### SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

CAS #	OSHA PEL	ACGIH TLV	%
12067-46-8	0.2mg/m <sup>3</sup>	0.2mg/m <sup>3</sup>	0.0-100.0%

### SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: N/A

Vapor Pressure (vs. air or mmHg): N/A

Melting Point: N/A

Specific Gravity(H<sub>2</sub>O=1): 0.92gm/cc

Evaporation Rate: N/A

Flash Point: N/A

Solubility in water: Insoluble

*Appearance and odor:* Blue powder and pieces, no odor

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

*Method Used:* Unknown

*Explosive Limits:* LEL: N/A

UEL: N/A

*Extinguishing Media:* Use class D or other extinguishing agent for metal fires.

*Special Fire Fighting Procedures:*

Firefighters must wear full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

*Unusual Fire and Explosion Hazards:*

When heated to decomposition, tungsten selenide may emit toxic fumes of selenium.



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## SECTION V - REACTIVITY DATA

*Stability:* Stable

*Conditions to Avoid (instability):* None

*Incompatibility:* None recorded

*Hazardous Decomposition or Byproducts:* Fumes of selenium.

*Hazardous Polymerization:* Will not occur.

*Conditions to avoid (hazardous polymerization):* None.

## SECTION VI - HEALTH HAZARD DATA

*Routes of entry:* Inhalation? Yes      Skin? Yes      Eyes? Yes

Ingestion? Yes      Other? No

To the best of our knowledge the chemical, physical and toxicological properties of zinc selenide have been thoroughly investigated and recorded.

Industrially, tungsten does not constitute an important health hazard. Exposure is related chiefly to the dust arising from the crushing and milling of the two chief ores of tungsten, namely sheelite and wolframite. Large overdoses cause central nervous system disturbances, diarrhea, respiratory failure and death in experimental animals. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Selenium compounds are poison by inhalation and intravenous routes. Some selenium compounds are experimental carcinogens. Long-term exposure may be a cause of amyotrophic lateral sclerosis in humans, just as it may cause "blind staggers" in cattle. Elemental selenium has low acute systemic toxicity, but dust or fumes can cause serious irritation of the respiratory tract. Inorganic selenium compounds can cause dermatitis. Garlic odor of breath is a common symptom. Pallor, nervousness, depression, digestive disturbances and death have been reported in cases if chronic exposure. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

### Signs and Symptoms of Overexposure:

*Inhalation:* Acute selenium poisoning may cause nervousness, fever, vomiting, somnolence, low blood pressure, labored breathing, depression, and coated tongue, garlic odor of breath.

*Ingestion:* May cause alkali disease, loss of vitality, atrophy, cirrhosis of the liver, degeneration and necrosis of the myocardium.

*Skin:* May cause redness, inflammation, and burning.

*Eyes:* May cause redness, itching, and watering.



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Health Hazards (Acute and Chronic):

*Inhalation:*

Acute: POISON, may cause irritation to the respiratory tract and acute selenium poisoning.

Chronic: May cause chronic selenium poisoning, loss of nails, hemolytic anemia, kidney, liver and spleen damage.

*Ingestion:*

Acute: May cause gastrointestinal disturbances.

Chronic: May cause chronic selenium poisoning, damage to nervous system and diarrhea.

*Skin:*

Acute: May cause irritation.

Chronic: May cause dermatitis

*Eye:*

Acute: May cause irritation.

Chronic: No chronic health effects recorded

*Target Organs:* Upper respiratory system, eyes, skin, liver, kidneys and blood.

*Carcinogenicity:* NTP? No IARC Monographs: No OSHA Regulated? No

*Medical Conditions Aggravated by Exposure:* Pre-existing respiratory and skin disorder.

Emergency and First Aid Procedures:

*Inhalation:* Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention.

*Ingestion:* Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

*Skin:* Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water, and seek medical attention if symptoms persist.

*Eye:* Flush eyes with lukewarm water, lifting upper and lower eyelids for at least 15 minutes and seek medical attention.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE
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*Steps to be taken in case material is released or spilled:*

Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

*Waste disposal method:*

In accordance with Federal, State and Local Regulations.



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*Hazard Label Information:*

Store in cool, dry area in tightly sealed container. Wash thoroughly after handling.

SECTION VIII - CONTROL MEASURES
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*Protective Equipment Summary (Hazard Label Information):*

NIOSH approved respirator, impervious gloves, safety glasses, clothes to prevent contact.

*Ventilation:*

Local Exhaust: To maintain concentration at low exposure levels.

Special: Handle in a controlled, enclosed process.

Mechanical (General): Not recommended

Other: None

*Work/Hygienic/Maintenance Practices:*

Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. 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.

Please be advised that N/A can either mean Not Applicable or No Data Has Been Established
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