

# Zinc Selenide Safety Data Sheet v3.1

Product Name:	Zinc Selenide (ZnSe)
Common Chemical name:	Zinc Selenide
CAS No.:	% 1315-09-9
EU Number:	034-002-00-8
Product Use	Optic elements

## HAZARDS IDENTIFICATION

### GHS Classification

Safety information	
GHS Hazard Statements	H301 - Toxic if swallowed H331 - Toxic if inhaled H373 - May cause damage to organs through prolonged or repeated exposure H410 - Very toxic to aquatic life with long lasting effects.
Safety Precautions	P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray P273 - Avoid release to the environment P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician P311 - Call a POISON CENTER or doctor/ physician P501 - Dispose of contents/ container to an approved waste disposal plant.

### GHS Label

Name	Contains
Zinc Selenide	Selenium Compounds

### Symbols



## COMPOSITION / INFORMATION ON INGREDIENTS

### Substance/Preparation: Substance

Component	CAS Number	Weight
Zinc	7440-66-6	45.3
Selenium	7782-49-2	54.7

## FIRST AID MEASURES

**Eye:** Eye Irritation, Flush immediately with large amounts of water for at least 15 minutes. Consult physician if irritation develops or persists.

**Skin:** Wash with soap and water. Consult physician if irritation develops or persists

**Inhalation:** Remove from exposure, treat symptomatically, consult physician

**Ingestion:** Consult physician.

## FIRE FIGHTING MEASURES

**Suitable Extinguishing Media:** Use extinguishing media that can safely extinguish fuel of fire, Zinc selenide is not flammable and not explosive.

**Fire Fighting Procedures:** Exposed Firefighters must wear NIOSH-approved positive pressure self-contained breathing apparatus with full face mask and full protective clothing.

**Unusual Fire and Explosion Hazards:** Extreme heat greater than 500 °C could result in decomposition. Decomposition products include Selenium/Oxides of Selenium, Zinc Oxide and Hydrogen Selenide.

**Combustion Products:** This product is not combustible.

## ACCIDENTAL RELEASE MEASURES

**Solid Form:** If parts are dropped or otherwise broken, sweep up pieces as one would clean-up glass use (use caution with sharp edges) and use caution when transferring to disposal container. Put resistant gloves and NIOSH approved dust mask or particulate respirator are recommended.

**Dust Form:** Avoid getting Zinc Selenium dust in eyes. Use safety glasses with side shields or goggles. Use NIOSH approved dust mask or particulate respirator. If the dust is airborne allow time for the dust to settle. Clean up the dust with a damp cloth or mop.

**In Case Of Vaporisation:** Leave room and allow dust to settle. Clean all surfaces while wearing protective gloves. If room has ventilation, allow for several air changes. Locate exhaust near location of ZnSe processing or use if failure by melting is likely.

## HANDLING AND STORAGE

**Handling:** If the material is to be machined, ground or polished, it should be done wet to prevent dust that could be inhaled. Good work practices such as using impermeable gloves, keeping hands cleaned and not letting slurry splash significantly should be followed so that potential contamination of food is avoided. Always wash hands and face after handling material and before eating, drinking or smoking.

Keep away from heat that could raise the material's temperature to 500°C or higher.

**Storage:** Do not store this material with acids, bases, or oxidising agents.

## EXPOSURE CONTROLS

Exposure Limits

Material	OSHA 8 hr, TWA	ACCIH 8 hr, TWA	NIOSH REL 8 hr, TWA
Particles – Total Dust	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
Particles – Respirable	5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	--
Selenium and compounds, as Se	0.2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>

Other Exposure Limits

Exposure Limits	Selenium Compounds
"VME" (France):	TWA: 0.2 mg/m <sup>3</sup> (0,05ppm) (en Se)
"MAK" (Germany):	TWA: 0.1 mg/m <sup>3</sup> (total dust) (als Se)
"MAC" (Netherlands):	TWA: 0.1 mg/m <sup>3</sup> (als Se)
"OEL" (United Kingdom):	TWA: 0.1 mg/m <sup>3</sup> (als Se)
Italy:	TWA: 0.1 mg/m <sup>3</sup> (comme Se) Personal Protective Equipment

**Engineering Controls:** If the material is to be machined, ground, or polished, processes should be done wet as to prevent dust that could be inhaled. Local exhaust ventilation may be necessary to control air contaminants below their exposure limits.

**Personal Protective Equipment:**

Eye Protection: Safety glasses or goggles.

Skin Protection: Impervious gloves, protective work clothing.

Respiratory Protection: Use a NIOSH approved dust mask or particulate respirator.

## PHYSICAL AND CHEMICAL PROPERTIES

Form	Solid
Colour	Yellow transparent
Odour	None
Boiling point	Sublime
Melting point at 760 mmHg	1525°C
Specific gravity (H 0 =1)	5.27
pH	Not applicable
Solubility in water	Insoluble
Vapour density (air = 1)	Not applicable
Vapour pressure	Not applicable
Flash point	Not applicable
Auto-ignition temperature	Not applicable
Lower explosion point	Not applicable
Upper explosion point	Not applicable
Pour point	Not applicable
Molecular Formula	ZnSe
Molecular Weight	143.3
Evaporation Rate	Not applicable

## STABILITY AND REACTIVITY

**Stability/Incompatibility:** Stable; not reactive. Materials to avoid are strong acids, strong bases and oxidisers.

**Hazardous Reactions/Decomposition Products:** Decomposition products include Selenium, Oxides of Selenium, Zinc Oxide, and Hydrogen Selenide.

## TOXICOLOGICAL INFORMATION

### Signs and Symptoms of Overexposure: EFFECTS OF OVEREXPOSURE:

ZnSe – Effects are not known except that Zinc Selenide as a compound was found to be non-toxic at 5 g/1 kg in “Acute Oral Limit Toxicity Study” conducted by Toxikon. The test as initiated on January 7, 1993 by II-VI Inc and it was performed according to Federal Hazardous Substances Act 16CFR, Part 1500.3 January 1990.

### Additional toxicological information (selenium compounds, zinc oxide/zinc oxide fumes:

**EPA-D:** Not classifiable as to human carcinogenicity: Inadequate human and animal evidence of carcinogenicity or no data available.

**IARC-3:** Unclassifiable as to carcinogenicity in humans.

**MAK-3B:** In vitro tests or animal studies have yielded evidence of carcinogenic effects that is not sufficient for classification of the substance in one of the other categories: Further studies are required before a final classification can be made.

### Acute Organ Effects:

Eye contact: Dust may cause eye irritation.

Skin Contact: May cause mild, reversible skin irritation if it contacts skin while in slurry physical state.

Inhalation: May cause irritation.

Ingestion: May cause discomfort.

**Chronic Target Organ Effects:** Unknown

**Acute Toxicity Values:** Oral LD<sub>50</sub> (Rat) = Non toxic @ 5g/kg

## ECOLOGICAL INFORMATION

**LC<sub>50</sub> (Fathead Minnows):** Not available

**EC<sub>50</sub> (Daphnia):** Not available

**Bioaccumulation:** No information found in selected references.

## DISPOSAL CONSIDERATION

Dispose of in an industrial waste facility.

## TRANSPORTATION INFORMATION

**Generic:** ZnSe material should be wrapped in lens tissue and placed in individual plastic boxes to avoid possible breakage.

**KEMET:** ZnSe is provided in a metal frame.

UN 3283 Selenium Compound, Solid, NOS, (Zinc Selenide), Hazard Class 6.1

Not a DOT hazardous material for transportation

Sea: This product is not classified according to IMDG.

Air: This product is not classified according to IATA.

## REGULATORY INFORMATION

### US Federal Regulations

Comprehensive Environmental Responsibility and Liability Act of 1980 (CERCLA) RQ:	No
EPCRA Section 131 Toxic Chemical:	Yes
EPCRA Section 304 (EHS) RQ:	No
SARA Section 311/312 (40 CFR 370) Hazard Categories:	
Immediate Hazard:	X
Delayed Hazard:	
Fire Hazard:	
Pressure Hazard:	
Reactivity Hazard:	

This product contains the following toxic chemicals subject to reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and d 40 CFR part 372.

Component	Category Code	maximum %
Selenium	N725	54.7
Zinc	N982	46.3

Toxic substances Control Act (TSCA):	Listed on Inventory
Clean Air Act (CAA) 112 (r) TQ:	No

### International Regulations

European Inventory of Existing Chemicals (EINECS): All of the components of this product are included on EINECS.

Label Name: Zinc Selenide (Contains Selenium compounds)

EU Risk (r) and Safety (S) Phrases: (Included here for completeness) but see GHS section above.

Risk Phrases:	23/25 Toxic by inhalation, in contact with skin and if swallowed.
	33 Danger of cumulative effects
	50/53 Very toxic to aquatic organisms. May cause long-term adverse effects in aquatic environment.
Safety Phrases:	20/21 When using do not eat, drink or smoke
	28 After contact with skin, wash immediately with plenty of soap and warm water.
	44 If you feel unwell, seek medical advice immediately (show label where possible)

## OTHER INFORMATION

### NFPA Ratings

Health	Flammability	Reactivity
1	0	0

This information is intended solely for the use of individual trained in the NFPA system.

### HMIS Ratings

Health	Flammability	Reactivity	PPE
1	0	0	X