



ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	Molybdenum diselenide few-layer film on SiO ₂ /Si
Synonyms	Molybdenum (IV) selenide, Molybdenum selenide
Chemical Name	Molybdenum diselenide
Chemical Formula	MoSe ₂
Product code	M2170
CAS No.	12058-18-3
EC No.	235-027-9
REACH Registration No.	Not applicable.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s)	PC21 Laboratory chemicals
-------------------	---------------------------

1.3 Details of the supplier of the safety data sheet

Company Identification	Ossila Limited
Address of Supplier	Solpro Business Park Windsor Street Sheffield
Postal code	S4 7WB, UK
Telephone:	+441142999180
E-mail	info@ossila.com
Office hours	08:00 - 17:00

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008 (CLP)	Acute Tox. 3: Toxic if swallowed. Acute Tox. 3: Toxic if inhaled. STOT RE 2: May cause damage to organs through prolonged or repeated exposure. Aquatic Chronic 1: Very toxic to aquatic life with long lasting effects.
-------------------------------------	---

2.2 Label elements

Product Name	According to Regulation (EC) No. 1272/2008 (CLP) Molybdenum diselenide few-layer film on SiO ₂ /Si
--------------	--

Hazard Pictogram(s)



GHS06
GHS08
GHS09

Signal Word(s) Danger

Hazard Statement(s) H301 + H331: Toxic if swallowed or if inhaled.
H373: May cause damage to organs through prolonged or repeated exposure.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s) P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P301 + P310 + P330: IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.
P304 + P340 + P311: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician.

2.3 Other hazards

None known.

2.4 Additional Information

Not applicable.



SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

HAZARDOUS INGREDIENT(S)	CAS No.	EC No. / REACH Registration No.	%W/W	Hazard Statement(s)
Silicon	7440-21-3	235-027-9	>99	Not classified
Silicon dioxide	7631-86-9		<0.1	Not classified
Molybdenum Diselenide	12058-18-3		<0.1	Acute Tox. 3 H301 Acute Tox. 3 H331 STOT RE 2 H373 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

3.2 Mixtures

Not applicable.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician.
Skin Contact	Rinse skin with water. If skin irritation occurs, get medical advice/attention.
Eye Contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Ingestion	Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.

4.2 Most important symptoms and effects, both acute and delayed

SECTION 11: Most important symptoms and effects, both acute and delayed

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing media	As appropriate for surrounding fire.
Unsuitable extinguishing media	As appropriate for surrounding fire.

5.2 Special hazards arising from the substance or mixture

May decompose in a fire, giving off toxic and irritant vapours.

5.3 Advice for firefighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation. Wear protective clothing as per section 8.

6.2 Environmental precautions

Avoid release to the environment.

6.3 Methods and material for containment and cleaning up

Sweep up spilled substance but avoid making dust. Use vacuum equipment for collecting spilt materials, where practicable. Dispose of contents in accordance with local, state or national legislation.

6.4 Reference to other sections

See Also Section 8, 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid breathing dust/aerosols. Use only in a well-ventilated area. Wear protective clothing as per section 8.

7.2 Conditions for safe storage, including any incompatibilities

Storage temperature	Ambient
Storage life	Stable under normal conditions.
Incompatible materials	None known.

7.3 Specific end use(s)

Not known. See Section: 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits



Occupational Exposure Limits						
SUBSTANCE.	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Molybdenum compounds (as Mo)insoluble compounds	7440-21-3 7631-86-9 12058-18-3		10		20	

Region EU United Kingdom
 Source EU Occupational Exposure Limits UK Workplace Exposure Limits EH40/2005 (Third edition, published 2018)

8.2 Exposure controls

8.2.1. Appropriate engineering controls Ensure adequate ventilation. A washing facility/water for eye and skin cleaning purposes should be present.

8.2.2. Personal protection equipment

Eye Protection

Wear eye protection with side protection (EN166).



Skin protection

Wear protective clothing and gloves: Impervious gloves (EN 374).



Respiratory protection

A suitable mask with filter type A (EN14387 or EN405) may be appropriate.



Thermal hazards

None known.



8.2.3. Environmental Exposure Controls Avoid release to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Film
	Colour: Transparent
Odour	Not known.
Odour threshold	Not known.
pH	Not known.
Melting point/freezing point	Not known
Initial boiling point and boiling range	Not known.
Flash Point	Not known.
Evaporation rate	Not known.
Flammability (solid, gas)	Not known.
Upper/lower flammability or explosive limits	Not known.
Vapour pressure	Not known.
Vapour density	Not known.
Density (g/ml)	Not known.
Relative density	Not known.
Solubility(ies)	Solubility (Water): Not known. Solubility (Other): Not known.
Partition coefficient: n-octanol/water	Not known.
Auto-ignition temperature	Not known.
Decomposition Temperature (°C)	Not known.
Viscosity	Not known.
Explosive properties	Not known.
Oxidising properties	Not known.

9.2 Other information

None.



SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity	None anticipated.
10.2 Chemical Stability	Stable under normal conditions.
10.3 Possibility of hazardous reactions	Not known.
10.4 Conditions to avoid	Not known.
10.5 Incompatible materials	Not known.
10.6 Hazardous decomposition products	No hazardous decomposition products known.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects	
Acute toxicity - Ingestion	Self classification: Toxic if swallowed.
Acute toxicity - Skin Contact	Not classified.
Acute toxicity - Inhalation	Self classification: Toxic if inhaled.
Skin corrosion/irritation	Not classified.
Serious eye damage/irritation	Not classified.
Skin sensitization data	Not classified.
Respiratory sensitization data	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity	Not classified.
Reproductive toxicity	Not classified.
Lactation	Not classified.
STOT - single exposure	Not classified.
STOT - repeated exposure	Self classification: May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	Not classified.
11.2 Other information	Not known.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity	Very toxic to aquatic life with long lasting effects.
Toxicity - Aquatic invertebrates	Not known.
Toxicity - Fish	Not known.
Toxicity - Algae	Not known.
Toxicity - Sediment Compartment	Not classified.
Toxicity - Terrestrial Compartment	Not classified.
12.2 Persistence and Degradation	Not known.
12.3 Bioaccumulative potential	Not known.
12.4 Mobility in soil	Not known.
12.5 Results of PBT and vPvB assessment	Not known.
12.6 Other adverse effects	Not known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods	Dispose of contents in accordance with local, state or national legislation. Recycle only completely emptied packaging. Normal disposal is via incineration operated by an accredited disposal contractor. Send to a licensed recycler, reclaimer or incinerator.
13.2 Additional Information	Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number	
UN No.	3283

**14.2 UN proper shipping name**

UN proper shipping name Selenium compound, solid, n.o.s. (Molybdenum diselenide)

14.3 Transport hazard class(es)ADR/RID 6.1
IMDG 6.1
IATA 6.1**14.4 Packing group**

Packing group III

14.5 Environmental hazards

Environmental hazards Classified as a Marine Pollutant.

14.6 Special precautions for user

Special precautions for user Not known.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not known.

SECTION 15: REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

European Regulations - Authorisations and/or Restrictions On Use

Candidate List of Substances of Very High Concern for Authorisation Not listed

REACH: ANNEX XIV list of substances subject to authorisation Not listed

REACH: Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not listed

Community Rolling Action Plan (CoRAP) Regulation (EC) N° 850/2004 of the European Parliament and of the Council on persistent organic pollutants Not listed

Regulation (EC) N° 1005/2009 on substances that deplete the ozone layer Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals Not listed

A REACH chemical safety assessment has not been carried out.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements:

LEGEND

Acronyms

ADN : European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
 ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road
 CAS : Chemical Abstracts Service
 CLP : Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
 DNEL : Derived No Effect Level
 EC : European Community
 EINECS : European Inventory of Existing Commercial Chemical Substances
 IATA : International Air Transport Association
 IBC : Intermediate Bulk Container
 ICAO : International Civil Aviation Organization
 IMDG : International Maritime Dangerous Goods
 LTEL : Long term exposure limit
 PBT : Persistent, Bioaccumulative and Toxic
 PNEC : Predicted No Effect Concentration
 REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals
 RID : Regulations concerning the International Carriage of Dangerous Goods by Rail
 STEL : Short term exposure limit
 STOT : Specific Target Organ Toxicity
 UN : United Nations



vPvB : very Persistent and very Bioaccumulative

Disclaimers

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Ossila Limited gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Ossila Limited accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.