



# SAFETY DATA SHEET

**MATERION**

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

<b>Name of the substance</b>	Molybdenum sulphide (MoS <sub>2</sub> )
<b>Identification number</b>	215-263-9 (EC number)
<b>Synonyms</b>	None.
<b>Document number</b>	1XE
<b>Materion Code</b>	1XE
<b>Issue date</b>	16-May-2015
<b>Version number</b>	03
<b>Revision date</b>	12-January-2018
<b>Supersedes date</b>	18-November-2015

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

<b>Identified uses</b>	Not available.
<b>Uses advised against</b>	None known.

### 1.3. Details of the supplier of the safety data sheet

#### Supplier

<b>Company name</b>	Materion Advanced Chemicals Inc.
<b>Address</b>	407 N. 13th Street 1316 W. St. Paul Avenue Milwaukee, WI 53233 United States
<b>Division</b>	Milwaukee
<b>Telephone</b>	414.212.0257
<b>e-mail</b>	advancedmaterials@materion.com
<b>Contact person</b>	Noreen Atkinson

### 1.4. Emergency telephone number

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

#### Classification according to Regulation (EC) No 1272/2008 as amended

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended.

<b>Hazard summary</b>	Exposure to powder or dusts may be irritating to eyes, nose and throat. Not classified for health hazards. However, occupational exposure to the mixture or substance(s) may cause adverse health effects.
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### 2.2. Label elements

#### Label according to Regulation (EC) No. 1272/2008 as amended

<b>Contains:</b>	Molybdenum Sulfide
<b>Hazard pictograms</b>	None.
<b>Signal word</b>	None.
<b>Hazard statements</b>	The substance does not meet the criteria for classification.

#### Precautionary statements

<b>Prevention</b>	Observe good industrial hygiene practices.
<b>Response</b>	Wash hands after handling.
<b>Storage</b>	Store away from incompatible materials.
<b>Disposal</b>	Dispose of waste and residues in accordance with local authority requirements.

<b>Supplemental label information</b>	For further information, please contact the Product Stewardship Department at +1.800.862.4118.
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### 2.3. Other hazards

None known.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

#### General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Molybdenum Sulfide	90 - 100	1317-33-5 215-263-9	-	-	
<b>Classification:</b>	-				

#### List of abbreviations and symbols that may be used above

M: M-factor

vPvB: very persistent and very bioaccumulative substance.

PBT: persistent, bioaccumulative and toxic substance.

#: This substance has been assigned Community workplace exposure limit(s).

## SECTION 4: First aid measures

#### General information

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

#### 4.1. Description of first aid measures

##### Inhalation

Move to fresh air. Call a physician if symptoms develop or persist.

##### Skin contact

Wash off with soap and water. Get medical attention if irritation develops and persists.

##### Eye contact

Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists.

##### Ingestion

Rinse mouth. Get medical attention if symptoms occur.

#### 4.2. Most important symptoms and effects, both acute and delayed

Dusts may irritate the respiratory tract, skin and eyes.

#### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5: Firefighting measures

#### General fire hazards

No unusual fire or explosion hazards noted.

#### 5.1. Extinguishing media

##### Suitable extinguishing media

Water fog. Foam. Dry chemical powder. Carbon dioxide (CO<sub>2</sub>).

##### Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

#### 5.2. Special hazards arising from the substance or mixture

During fire, gases hazardous to health may be formed.

#### 5.3. Advice for firefighters

##### Special protective equipment for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

##### Special firefighting procedures

Use water spray to cool unopened containers.

#### Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

## SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### For non-emergency personnel

Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. For personal protection, see section 8 of the SDS.

##### For emergency responders

Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.

#### 6.2. Environmental precautions

Avoid discharge into drains, water courses or onto the ground.

**6.3. Methods and material for containment and cleaning up** Avoid the generation of dusts during clean-up. Collect dust using a vacuum cleaner equipped with HEPA filter. Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

**6.4. Reference to other sections**

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

## SECTION 7: Handling and storage

**7.1. Precautions for safe handling**

Minimise dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid prolonged exposure. Practice good housekeeping.

**7.2. Conditions for safe storage, including any incompatibilities**

Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

**7.3. Specific end use(s)**

Not available.

## SECTION 8: Exposure controls/personal protection

**8.1. Control parameters**

**Occupational exposure limits**

**Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	MAK	10 mg/m <sup>3</sup>	Inhalable fraction.
	STEL	20 mg/m <sup>3</sup>	Inhalable fraction.

**Belgium. Exposure Limit Values.**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	TWA	10 mg/m <sup>3</sup>

**Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	TWA	10 mg/m <sup>3</sup>

**Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	MAC	10 mg/m <sup>3</sup>
	STEL	20 mg/m <sup>3</sup>

**Czech Republic. OELs. Government Decree 361**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	Ceiling	25 mg/m <sup>3</sup>
	TWA	5 mg/m <sup>3</sup>

**Denmark. Exposure Limit Values**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	TLV	10 mg/m <sup>3</sup>

**Estonia. OELs. Occupational Exposure Limits of Hazardous Substances. (Annex of Regulation No. 293 of 18 September 2001)**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	5 mg/m <sup>3</sup>	Respirable dust.
		10 mg/m <sup>3</sup>	Total dust.

**Greece. OELs (Decree No. 90/1999, as amended)**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	TWA	15 mg/m <sup>3</sup>

**Hungary. OELs. Joint Decree on Chemical Safety of Workplaces**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	STEL	60 mg/m <sup>3</sup>
	TWA	15 mg/m <sup>3</sup>

**Iceland. OELs. Regulation 154/1999 on occupational exposure limits**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	TWA	10 mg/m <sup>3</sup>

**Ireland. Occupational Exposure Limits**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	3 mg/m <sup>3</sup>	Respirable fraction.
		10 mg/m <sup>3</sup>	Inhalable fraction.

**Italy. Occupational Exposure Limits**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	3 mg/m <sup>3</sup>	Respirable fraction.
		10 mg/m <sup>3</sup>	Inhalable fraction.

**Lithuania. OELs. Limit Values for Chemical Substances, General Requirements**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	5 mg/m <sup>3</sup>	Respirable fraction.
		10 mg/m <sup>3</sup>	Inhalable fraction.

**Norway. Administrative Norms for Contaminants in the Workplace**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	TLV	10 mg/m <sup>3</sup>

**Poland. MACs. Regulation regarding maximum permissible concentrations and intensities of harmful factors in the work environment, Annex 1**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	STEL	10 mg/m <sup>3</sup>
	TWA	4 mg/m <sup>3</sup>

**Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	3 mg/m <sup>3</sup>	Respirable fraction.
		10 mg/m <sup>3</sup>	Inhalable fraction.

**Romania. OELs. Protection of workers from exposure to chemical agents at the workplace**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	STEL	10 mg/m <sup>3</sup>
	TWA	5 mg/m <sup>3</sup>

**Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	5 mg/m <sup>3</sup>	Respirable fraction.
		10 mg/m <sup>3</sup>	Inhalable fraction.

**Sweden. OELs. Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2015:7)**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	5 mg/m <sup>3</sup>	Respirable dust.
		10 mg/m <sup>3</sup>	Total dust.

**Switzerland. SUVA Grenzwerte am Arbeitsplatz**

Material	Type	Value	Form
Molybdenum Sulfide (CAS 1317-33-5)	TWA	10 mg/m3	Inhalable dust.

**UK. EH40 Workplace Exposure Limits (WELs)**

Material	Type	Value
Molybdenum Sulfide (CAS 1317-33-5)	STEL	20 mg/m3
	TWA	10 mg/m3

**Biological limit values** No biological exposure limits noted for the ingredient(s).

**Recommended monitoring procedures** Follow standard monitoring procedures.

**Derived no effect levels (DNELs)** Not available.

**Predicted no effect concentrations (PNECs)** Not available.

**8.2. Exposure controls**

**Appropriate engineering controls** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL (occupational exposure limit), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

**Individual protection measures, such as personal protective equipment**

**General information** Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

**Eye/face protection** Wear safety glasses with side shields (or goggles).

**Skin protection**

**- Hand protection** Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

**- Other** Wear suitable protective clothing.

**Respiratory protection** Wear respirator with dust filter.

**Thermal hazards** Wear appropriate thermal protective clothing, when necessary.

**Hygiene measures** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**Environmental exposure controls** Environmental manager must be informed of all major releases.

**SECTION 9: Physical and chemical properties****9.1. Information on basic physical and chemical properties****Appearance**

**Physical state** Solid.

**Form** Powder.

**Colour** Not available.

**Odour** Not available.

**Odour threshold** Not available.

**pH** Not available.

**Melting point/freezing point** 2375 °C (4307 °F)

**Initial boiling point and boiling range** 450 °C (842 °F)

**Flash point** Not available.

**Evaporation rate** Not available.

**Flammability (solid, gas)** Not available.

**Upper/lower flammability or explosive limits**

**Flammability limit - lower (%)** Not available.

**Flammability limit - upper (%)** Not available.

**Vapour pressure** < 0,0000001 kPa at 25 °C

**Vapour density** Not available.

**Relative density** Not available.

**Solubility(ies)**

**Solubility (water)** Not available.

**Partition coefficient (n-octanol/water)** Not available.

**Auto-ignition temperature** Not available.

**Decomposition temperature** Not available.

**Viscosity** Not available.

**Explosive properties** Not explosive.

**Oxidising properties** Not oxidising.

**9.2. Other information**

**Density** 5,06 g/cm<sup>3</sup> estimated at 15 °C

**Molecular formula** Mo-S<sub>2</sub>

**Molecular weight** 160,08 g/mol

**Specific gravity** 5,06 at 15 °C

**SECTION 10: Stability and reactivity**

**10.1. Reactivity** The product is stable and non-reactive under normal conditions of use, storage and transport.

**10.2. Chemical stability** Material is stable under normal conditions.

**10.3. Possibility of hazardous reactions** No dangerous reaction known under conditions of normal use.

**10.4. Conditions to avoid** Contact with incompatible materials.

**10.5. Incompatible materials** Strong oxidising agents.

**10.6. Hazardous decomposition products** No hazardous decomposition products are known.

**SECTION 11: Toxicological information**

**General information** Occupational exposure to the substance or mixture may cause adverse effects.

**Information on likely routes of exposure**

**Inhalation** Dust may irritate respiratory system. Prolonged inhalation may be harmful.

**Skin contact** Dust or powder may irritate the skin.

**Eye contact** Dust may irritate the eyes.

**Ingestion** May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.

**Symptoms** Dusts may irritate the respiratory tract, skin and eyes.

**11.1. Information on toxicological effects**

**Acute toxicity** No data available.

**Skin corrosion/irritation** Due to partial or complete lack of data the classification is not possible.

**Serious eye damage/eye irritation** Due to partial or complete lack of data the classification is not possible.

**Respiratory sensitisation** Due to partial or complete lack of data the classification is not possible.

**Skin sensitisation** Due to partial or complete lack of data the classification is not possible.

**Germ cell mutagenicity** Due to partial or complete lack of data the classification is not possible.

**Carcinogenicity** Due to partial or complete lack of data the classification is not possible.

**Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)**

Not listed.

**Reproductive toxicity** Due to partial or complete lack of data the classification is not possible.

<b>Specific target organ toxicity - single exposure</b>	Due to partial or complete lack of data the classification is not possible.
<b>Specific target organ toxicity - repeated exposure</b>	Due to partial or complete lack of data the classification is not possible.
<b>Aspiration hazard</b>	Due to partial or complete lack of data the classification is not possible.
<b>Mixture versus substance information</b>	No information available.
<b>Other information</b>	Not available.

## SECTION 12: Ecological information

<b>12.1. Toxicity</b>	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
<b>12.2. Persistence and degradability</b>	No data is available on the degradability of this product.
<b>12.3. Bioaccumulative potential</b>	No data available.
<b>Partition coefficient n-octanol/water (log Kow)</b>	Not available.
<b>Bioconcentration factor (BCF)</b>	Not available.
<b>12.4. Mobility in soil</b>	No data available.
<b>12.5. Results of PBT and vPvB assessment</b>	Not available.
<b>12.6. Other adverse effects</b>	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

### 12.7. Additional information

#### Estonia Dangerous substances in groundwater Data

Molybdenum Sulfide (CAS 1317-33-5)

Molybdenum (Mo) 5 UG/L  
Molybdenum (Mo) 70 UG/L

#### Estonia Dangerous substances in soil Data

Molybdenum Sulfide (CAS 1317-33-5)

Molybdenum (Mo) 10 mg/kg  
Molybdenum (Mo) 20 mg/kg  
Molybdenum (Mo) 200 mg/kg

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

<b>Residual waste</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
<b>EU waste code</b>	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>Disposal methods/information</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
<b>Special precautions</b>	Dispose in accordance with all applicable regulations.

## SECTION 14: Transport information

### ADR

14.1. - 14.6.: Not regulated as dangerous goods.

### RID

14.1. - 14.6.: Not regulated as dangerous goods.

### ADN

14.1. - 14.6.: Not regulated as dangerous goods.

### IATA

14.1. - 14.6.: Not regulated as dangerous goods.

### IMDG

14.1. - 14.6.: Not regulated as dangerous goods.

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

#### EU regulations

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended**

Not listed.

**Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended**

Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended**

Not listed.

**Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA**

Not listed.

#### Authorisations

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended**

Not listed.

#### Restrictions on use

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**

Not listed.

**Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.**

Not listed.

#### Other EU regulations

**Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended**

Not listed.

#### Other regulations

The product is classified and labelled in accordance with EC directives or respective national laws. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

#### National regulations

Follow national regulation for work with chemical agents.

#### 15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

## SECTION 16: Other information

#### List of abbreviations

Not available.

#### Information on evaluation method leading to the classification of mixture

Not applicable.

#### Disclaimer

Materion Advanced Chemicals Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. This document has been prepared using data from sources considered to be technically reliable and the information is believed to be correct. Materion makes no warranties, expressed or implied, as to the accuracy of the information contained herein. Materion cannot anticipate all conditions under which this information and its products may be used and the actual conditions of use are beyond its control. The user is responsible to evaluate all available information when using this product for any particular use and to comply with all Federal, State, Provincial and Local laws, statutes and regulations.