



**SAFETY DATA SHEET**  
SPECIALTY ELECTRONIC MATERIALS  
SWITZERLAND GMBH

**Product name: MOLYKOTE® BR-2 Plus High Performance Grease**

**Issue Date: 2022.07.15**

**Print Date: 2023.06.23**

SPECIALTY ELECTRONIC MATERIALS SWITZERLAND GMBH encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

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## 1. PRODUCT AND COMPANY IDENTIFICATION

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**Product name: MOLYKOTE® BR-2 Plus High Performance Grease**

**Recommended use of the chemical and restrictions on use**

**Identified uses:** Lubricants and lubricant additives

**COMPANY IDENTIFICATION**

SPECIALTY ELECTRONIC MATERIALS  
SWITZERLAND GMBH  
GROSSMATTE 4  
6014 LUZERN  
SWITZERLAND

**Customer Information Number:**

00800-3876-6838

SDSQuestion-EU@dupont.com

**EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:** +(41)- 435082011

**Local Emergency Contact:** +1 703-741-5970

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## 2. HAZARDS IDENTIFICATION

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**Classification of the substance or mixture**

Serious eye damage - Category 1 - H318

Long-term (chronic) aquatic hazard - Category 3 - H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

**Label elements**

**Hazard pictograms**



**Signal word: DANGER**

**Hazard statements**

H318 Causes serious eye damage.  
H412 Harmful to aquatic life with long lasting effects.

**Precautionary statements**

P273 Avoid release to the environment.  
P280 Wear eye protection/ face protection.  
P305 + P351 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/  
+ P338 + doctor.  
P310  
P501 Dispose of contents/ container to an approved waste disposal plant.

**Supplemental information**

The following percentage of the mixture consists of ingredient(s) with unknown acute dermal toxicity:  
1.3 %

**Contains** Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts

**Other hazards**

This product contains no substances assessed to be PBT or vPvB at levels of 0.1% or higher.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical nature:** Molybdenum disulfide grease

This product is a mixture.

CASRN / EC-No. / Index-No.	Concentration	Component	Classification
CASRN 68457-79-4 EC-No. 270-608-0 Index-No. -	>= 3.0 - < 10.0 %	Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	Skin Irrit. - 2 - H315 Eye Dam. - 1 - H318 Aquatic Chronic - 2 - H411
CASRN 64742-52-5 EC-No. 265-155-0 Index-No. 649-465-00-7	>= 40.0 - < 50.0 %	Distillates (petroleum), hydrotreated heavy naphthenic	Not classified
CASRN	>= 40.0 - < 50.0 %	Solvent dewaxed heavy	Not classified

64742-65-0 <b>EC-No.</b> 265-169-7 <b>Index-No.</b> 649-474-00-6		paraffinic distillates	
<b>CASRN</b> 7620-77-1 <b>EC-No.</b> 231-536-5 <b>Index-No.</b> —	>= 1.0 - < 10.0 %	Lithium 12-hydroxyoctadecanoate	Not classified
<b>CASRN</b> 64742-62-7 <b>EC-No.</b> 265-166-0 <b>Index-No.</b> 649-471-00-X	>= 1.0 - < 10.0 %	Solvent dewaxed residual oil (petroleum)	Not classified
<b>CASRN</b> 7782-42-5 <b>EC-No.</b> 231-955-3 <b>Index-No.</b> —	>= 1.0 - < 10.0 %	Graphite	Not classified
<b>CASRN</b> 1317-33-5 <b>EC-No.</b> 215-263-9 <b>Index-No.</b> —	>= 1.0 - < 10.0 %	Molybdenum disulfide	Not classified

For the full text of the H-Statements mentioned in this Section, see Section 16.

*Note*

Distillates (petroleum), hydrotreated heavy naphthenic:

The classification as a carcinogen need not to apply because the substance contains less than 3% DMSO extract as measured by IP 346. Note L of Annex VI to Regulation (EC) 1272/2008.

*Note*

Solvent dewaxed heavy paraffinic distillates:

The classification as a carcinogen need not to apply because the substance contains less than 3% DMSO extract as measured by IP 346. Note L of Annex VI to Regulation (EC) 1272/2008.

*Note*

Solvent dewaxed residual oil (petroleum):

The classification as a carcinogen need not to apply because the substance contains less than 3% DMSO extract as measured by IP 346. Note L of Annex VI to Regulation (EC) 1272/2008.

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## 4. FIRST AID MEASURES

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### Description of first aid measures

**General advice:** First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** No emergency medical treatment necessary.

**Skin contact:** Wash off with plenty of water. Suitable emergency safety shower facility should be available in work area.

**Eye contact:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available. Get medical attention immediately.

**Ingestion:** No emergency medical treatment necessary.

### Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

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

**Notes to physician:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

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## 5. FIREFIGHTING MEASURES

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### Extinguishing media

**Suitable extinguishing media:** Water spray. Alcohol-resistant foam. Carbon dioxide (CO<sub>2</sub>). Dry chemical.

**Unsuitable extinguishing media:** None known..

### Special hazards arising from the substance or mixture

**Hazardous combustion products:** Metal oxides. Oxides of phosphorus. Sulphur oxides. Carbon oxides.

**Unusual Fire and Explosion Hazards:** Exposure to combustion products may be a hazard to health..

### Advice for firefighters

**Fire Fighting Procedures:** Collect contaminated fire extinguishing water separately. This must not be discharged into drains.. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage..

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

**Special protective equipment for firefighters:** In the event of fire, wear self-contained breathing apparatus.. Use personal protective equipment..

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## **6. ACCIDENTAL RELEASE MEASURES**

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**Personal precautions, protective equipment and emergency procedures:** Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

**Environmental precautions:** Do not release the product to the aquatic environment above defined regulatory levels. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

**Methods and materials for containment and cleaning up:** Wipe up or scrape up and contain for salvage or disposal. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, Sections 13 and 15 of this SDS provide information regarding certain local or national requirements. See sections: 7, 8, 11, 12 and 13.

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## **7. HANDLING AND STORAGE**

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**Precautions for safe handling:** Do not get on skin or clothing. Do not swallow. Do not get in eyes. Keep container tightly closed. Take care to prevent spills, waste and minimize release to the environment. Handle in accordance with good industrial hygiene and safety practice. Use only with adequate ventilation. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

**Conditions for safe storage:** Keep in properly labelled containers. Keep tightly closed. Store in accordance with the particular national regulations.

Do not store with the following product types: Strong oxidizing agents.  
 Unsuitable materials for containers: None known.

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## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**Control parameters**

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

<b>Component</b>	<b>Regulation</b>	<b>Type of listing</b>	<b>Value</b>
Distillates (petroleum), hydrotreated heavy naphthenic	ACGIH	TWA Inhalable particulate matter	5 mg/m3
Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen			

	ARE OEL	TWA Mist	0.2 mg/m3
	ARE OEL	TWA Measured as inhalable fraction of the aerosol.	5 mg/m3
	Further information: A4: Not Classifiable as a Human Carcinogen		
Solvent dewaxed heavy paraffinic distillates	ACGIH	TWA Inhalable particulate matter	5 mg/m3
	Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen		
	ARE OEL	TWA Mist	0.2 mg/m3
Lithium 12-hydroxyoctadecanoate	ACGIH	TWA Inhalable particulate matter	10 mg/m3
	Further information: LRT irr: Lower Respiratory Tract irritation; J: Does not include stearates of toxic metals.; A4: Not classifiable as a human carcinogen; varies: varies		
	ACGIH	TWA Respirable particulate matter	3 mg/m3
	Further information: LRT irr: Lower Respiratory Tract irritation; J: Does not include stearates of toxic metals.; A4: Not classifiable as a human carcinogen; varies: varies		
	ARE OEL	TWA	10 mg/m3
	Further information: A4: Not Classifiable as a Human Carcinogen; (J): Does not include stearates of toxic metals.		
Solvent dewaxed residual oil (petroleum)	ACGIH	TWA Inhalable particulate matter	5 mg/m3
	Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen		
	ARE OEL	TWA Measured as inhalable fraction of the aerosol.	5 mg/m3
	Further information: A4: Not Classifiable as a Human Carcinogen		
	ARE OEL	TWA Mist	0.2 mg/m3
Graphite	ACGIH	TWA Respirable particulate matter	2 mg/m3
	Further information: pneumoconiosis: Pneumoconiosis		
	ARE OEL	TWA Respirable dust	2 mg/m3
	ARE OEL	TWA Respirable dust	2 mg/m3
Molybdenum disulfide	ACGIH	TWA Inhalable particulate matter	10 mg/m3 , Molybdenum
	ACGIH	TWA Respirable particulate matter	3 mg/m3 , Molybdenum
	ARE OEL	TWA Respirable dust	3 mg/m3 , Molybdenum
	ARE OEL	TWA Measured as inhalable fraction of the aerosol.	10 mg/m3 , Molybdenum

**Exposure controls**

**Engineering controls:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

**Individual protection measures**

**Eye/face protection:** Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

**Skin protection**

**Hand protection:** Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Other protection:** Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

**Respiratory protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. If there are no applicable exposure limit requirements or guidelines, use an approved respirator.

See SECTION 7: Handling and storage and SECTION 13: Disposal considerations for measures to prevent excessive environmental exposure during use and waste disposal.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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<b>Appearance</b>	
<b>Physical state</b>	Grease
<b>Color</b>	black
<b>Odor</b>	slight
<b>Odor Threshold</b>	No data available
<b>pH</b>	Not applicable
<b>Melting point/range</b>	No data available
<b>Freezing point</b>	No data available
<b>Boiling point (760 mmHg)</b>	Not applicable
<b>Flash point</b>	<b>closed cup</b> >200 °C
<b>Evaporation Rate (Butyl Acetate = 1)</b>	Not applicable
<b>Flammability (solid, gas)</b>	Not classified as a flammability hazard
<b>Lower explosion limit</b>	No data available
<b>Upper explosion limit</b>	No data available
<b>Vapor Pressure</b>	Not applicable
<b>Relative Vapor Density (air = 1)</b>	No data available
<b>Relative Density (water = 1)</b>	0.89
<b>Water solubility</b>	No data available
<b>Partition coefficient: n-octanol/water</b>	No data available
<b>Auto-ignition temperature</b>	No data available
<b>Decomposition temperature</b>	No data available
<b>Dynamic Viscosity</b>	Not applicable
<b>Kinematic Viscosity</b>	Not applicable

<b>Explosive properties</b>	Not explosive
<b>Oxidizing properties</b>	The substance or mixture is not classified as oxidizing.
<b>Molecular weight</b>	No data available
<b>Particle size</b>	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Not classified as a reactivity hazard.

**Chemical stability:** Stable under normal conditions.

**Possibility of hazardous reactions:** Can react with strong oxidizing agents.

**Conditions to avoid:** None known.

**Incompatible materials:** Oxidizing agents

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

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## 11. TOXICOLOGICAL INFORMATION

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*Toxicological information appears in this section when such data is available.*

### **Acute toxicity**

#### **Acute oral toxicity**

Product test data not available. Refer to component data.

#### **Acute dermal toxicity**

Product test data not available. Refer to component data.

#### **Acute inhalation toxicity**

Product test data not available. Refer to component data.

### **Skin corrosion/irritation**

Product test data not available. Refer to component data.

### **Serious eye damage/eye irritation**

Product test data not available. Refer to component data.

### **Sensitization**

Product test data not available. Refer to component data.

### **Specific Target Organ Systemic Toxicity (Single Exposure)**

Product test data not available. Refer to component data.



**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

Product test data not available. Refer to component data.

**Carcinogenicity**

Product test data not available. Refer to component data.

**Teratogenicity**

Product test data not available. Refer to component data.

**Reproductive toxicity**

Product test data not available. Refer to component data.

**Mutagenicity**

Product test data not available. Refer to component data.

**Aspiration Hazard**

Product test data not available. Refer to component data.

**COMPONENTS INFLUENCING TOXICOLOGY:**

**Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts**

**Acute oral toxicity**

LD50. Rat. male. 3,600 mg/kg

**Acute dermal toxicity**

LD50. Rabbit. male and female. > 20,000 mg/kg

**Acute inhalation toxicity**

The LC50 has not been determined.

**Skin corrosion/irritation**

Brief contact may cause slight skin irritation with local redness.

**Serious eye damage/eye irritation**

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

**Sensitization**

For skin sensitization:

Based on data from similar materials

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

Observations in animals include:

Gastrointestinal irritation.

**Carcinogenicity**

No relevant data found.

**Teratogenicity**

No relevant data found.

**Reproductive toxicity**

No relevant data found.

**Mutagenicity**

For similar material(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

**Aspiration Hazard**

Based on physical properties, not likely to be an aspiration hazard.

**Distillates (petroleum), hydrotreated heavy naphthenic**

**Acute oral toxicity**

LD50. Rat. > 5,000 mg/kg

**Acute dermal toxicity**

LD50. Rabbit. > 2,000 mg/kg

**Acute inhalation toxicity**

Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs.

LC50. Rat. 3 Hour. dust/mist. > 3.11 mg/l No deaths occurred at this concentration.

**Skin corrosion/irritation**

Prolonged contact is essentially nonirritating to skin.

Repeated contact may cause moderate skin irritation with local redness.

**Serious eye damage/eye irritation**

Essentially nonirritating to eyes.

**Sensitization**

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant information found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

In animals, effects have been reported on the following organs after dermal exposure:

Skin.

**Carcinogenicity**

Has caused tumors in skin painting tests in animals. Not classifiable as a human carcinogen.

**Teratogenicity**

Did not cause birth defects or any other fetal effects in laboratory animals.

**Reproductive toxicity**

In animal studies, did not interfere with reproduction.

**Mutagenicity**

In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

**Aspiration Hazard**

Based on physical properties, not likely to be an aspiration hazard.

**Solvent dewaxed heavy paraffinic distillates**

**Acute oral toxicity**

Typical for this family of materials. LD50. Rat. > 5,000 mg/kg

**Acute dermal toxicity**

Typical for this family of materials. LD50. Rabbit. > 2,000 mg/kg

**Acute inhalation toxicity**

LC50. Rat. male and female. 4 Hour. dust/mist. > 5 mg/l No deaths occurred at this concentration.

**Skin corrosion/irritation**

Brief contact may cause slight skin irritation with local redness. Prolonged contact may cause moderate skin irritation with local redness.

**Serious eye damage/eye irritation**

May cause slight eye irritation. Corneal injury is unlikely.

**Sensitization**

For skin sensitization:  
No relevant data found.

For respiratory sensitization:  
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

The substance or mixture is not classified as specific target organ toxicant, single exposure.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

For this family of materials:  
In animals, effects have been reported on the following organs:  
Liver.

**Carcinogenicity**

For this family of materials: Did not cause cancer in animal skin painting studies.

**Teratogenicity**

Typical for this family of materials. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

**Reproductive toxicity**

Typical for this family of materials. Limited data in laboratory animals suggest that the material does not affect reproduction.

**Mutagenicity**

Typical for this family of materials. In vitro genetic toxicity studies were predominantly negative.

**Aspiration Hazard**

Based on physical properties, not likely to be an aspiration hazard.

**Lithium 12-hydroxyoctadecanoate**

**Acute oral toxicity**

LD50. Rat. female. > 2,000 mg/kg OECD Test Guideline 420 No deaths occurred at this concentration.

**Acute dermal toxicity**

LD50. Rat. male and female. > 2,000 mg/kg OECD Test Guideline 402 No deaths occurred at this concentration.

**Acute inhalation toxicity**

The LC50 has not been determined.

**Skin corrosion/irritation**

Brief contact is essentially nonirritating to skin.

**Serious eye damage/eye irritation**

May cause slight eye irritation.

**Sensitization**

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

**Carcinogenicity**

No relevant data found.

**Teratogenicity**

Did not cause birth defects in laboratory animals.

**Reproductive toxicity**

In animal studies, did not interfere with reproduction.

**Mutagenicity**

In vitro genetic toxicity studies were negative.

**Aspiration Hazard**

Based on physical properties, not likely to be an aspiration hazard.

**Solvent dewaxed residual oil (petroleum)**

**Acute oral toxicity**

LD50. Rat. male and female. > 5,000 mg/kg

**Acute dermal toxicity**

LD50. Rabbit. male and female. > 2,000 mg/kg No deaths occurred at this concentration.

**Acute inhalation toxicity**

LC50. Rat. male and female. 4 Hour. dust/mist. > 5.53 mg/l No deaths occurred at this concentration.

**Skin corrosion/irritation**

Prolonged contact may cause moderate skin irritation with local redness.

**Serious eye damage/eye irritation**

May cause slight temporary eye irritation.  
Corneal injury is unlikely.

**Sensitization**

Did not cause allergic skin reactions when tested in guinea pigs.  
Did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:  
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

In animals, effects have been reported on the following organs:  
Liver.

**Carcinogenicity**

No relevant information found.

**Teratogenicity**

Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

**Reproductive toxicity**

In animal studies, did not interfere with reproduction.

**Mutagenicity**

In vitro genetic toxicity studies were negative in some cases and positive in other cases.  
Animal genetic toxicity studies were negative.

**Aspiration Hazard**

Based on available information, aspiration hazard could not be determined.

**Graphite**

**Acute oral toxicity**

LD50. Rat. > 2,000 mg/kg OECD Test Guideline 423

**Skin corrosion/irritation**

Brief contact is essentially nonirritating to skin.

**Serious eye damage/eye irritation**

May cause slight temporary eye irritation.

**Sensitization**

Did not demonstrate the potential for contact allergy in mice.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

The substance or mixture is not classified as specific target organ toxicant, single exposure.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

**Teratogenicity**

Did not cause birth defects or any other fetal effects in laboratory animals.

**Reproductive toxicity**

In animal studies, did not interfere with reproduction.

**Mutagenicity**

In vitro genetic toxicity studies were negative.

**Aspiration Hazard**

No aspiration toxicity classification

**Molybdenum disulfide**

**Acute oral toxicity**

LD50. Rat. > 2,000 mg/kg No deaths occurred at this concentration.

**Acute dermal toxicity**

LD50. Rat. male and female. > 2,000 mg/kg No deaths occurred at this concentration.

**Skin corrosion/irritation**

Brief contact is essentially nonirritating to skin.

Prolonged contact may cause slight skin irritation with local redness.

**Serious eye damage/eye irritation**

May cause slight temporary eye irritation.

Corneal injury is unlikely.

**Sensitization**

For skin sensitization:

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

No relevant data found.

**Carcinogenicity**

No relevant data found.

**Teratogenicity**

No relevant data found.

**Reproductive toxicity**

No relevant data found.

**Mutagenicity**

For similar material(s): In vitro genetic toxicity studies were negative.

**Aspiration Hazard**

Based on physical properties, not likely to be an aspiration hazard.

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**12. ECOLOGICAL INFORMATION**

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*Ecotoxicological information appears in this section when such data is available.*

**Toxicity****Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts****Acute toxicity to fish**

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

Based on data from similar materials

LL50. *Cyprinodon variegatus* (sheepshead minnow). semi-static test. 96 Hour. 4.5 mg/l. OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**

Based on data from similar materials

EL50. *Daphnia magna* (Water flea). static test. 48 Hour. 23 mg/l. OECD Test Guideline 202

**Acute toxicity to algae/aquatic plants**

Based on data from similar materials

EL50. *Desmodesmus subspicatus* (green algae). 72 Hour. 24 mg/l. OECD Test Guideline 201

**Toxicity to bacteria**

Based on data from similar materials

EC50. 3 Hour. > 1,000 mg/l. OECD Test Guideline 209

**Chronic toxicity to aquatic invertebrates**

Based on data from similar materials

NOEC. *Daphnia magna* (Water flea). 21 d. 0.4 mg/l

**Distillates (petroleum), hydrotreated heavy naphthenic****Acute toxicity to fish**

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LC50. *Oncorhynchus mykiss* (rainbow trout). static test. 96 Hour. > 1,000 mg/l. OECD Test Guideline 203 or Equivalent

LC50. Oncorhynchus mykiss (rainbow trout). 96 Hour. > 5,000 mg/l. OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50. Daphnia magna (Water flea). static test. 48 Hour. > 1,000 mg/l. OECD Test Guideline 202 or Equivalent

EC50. scud Gammarus sp.. 96 Hour. > 10,000 mg/l. Method Not Specified.

**Acute toxicity to algae/aquatic plants**

EbC50. alga Scenedesmus sp.. static test. 96 Hour. Biomass. > 1,000 mg/l. OECD Test Guideline 201 or Equivalent

**Chronic toxicity to fish**

NOEC. Pimephales promelas (fathead minnow). 7 d. growth. > 5,000 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC. Daphnia magna (Water flea). 21 d. number of offspring. > 1,000 mg/l

**Solvent dewaxed heavy paraffinic distillates**

**Acute toxicity to fish**

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LL50. Pimephales promelas (fathead minnow). static test. 96 Hour. > 100 mg/l

**Acute toxicity to aquatic invertebrates**

EL50. Daphnia magna (Water flea). static test. 48 Hour. > 10,000 mg/l

**Acute toxicity to algae/aquatic plants**

NOEC. Pseudokirchneriella subcapitata (green algae). static test. 72 Hour. Growth rate. > 100 mg/l

**Toxicity to bacteria**

Based on data from similar materials

NOEC. 10 min. > 1.93 mg/l. DIN 38 412 Part 8

**Chronic toxicity to aquatic invertebrates**

Based on data from similar materials

NOEC. Daphnia magna (Water flea). 21 d. 10 mg/l

**Lithium 12-hydroxyoctadecanoate**

**Acute toxicity to fish**

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LC50. Oncorhynchus mykiss (rainbow trout). semi-static test. 96 Hour. > 100 mg/l. OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**

EC50. Daphnia magna (Water flea). static test. 48 Hour. > 100 mg/l. OECD Test Guideline 202

**Acute toxicity to algae/aquatic plants**

EC50. Pseudokirchneriella subcapitata (green algae). static test. 72 Hour. Growth rate. > 160 mg/l. OECD Test Guideline 201



**Solvent dewaxed residual oil (petroleum)**

**Acute toxicity to fish**

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

LL50. Pimephales promelas (fathead minnow). Static. 96 Hour. > 100 mg/l. OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

LL50. scud Gammarus sp.. semi-static test. 48 Hour. > 10,000 mg/l. OECD Test Guideline 202 or Equivalent

EL50. water flea Daphnia magna. Static. 48 Hour. > 10,000 mg/l. OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

NOEC. green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum). Static. 72 Hour. Growth rate inhibition. > 100 mg/l. OECD Test Guideline 201 or Equivalent

**Toxicity to bacteria**

Based on data from similar materials

NOEC. 10 min. > 1.93 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC. Daphnia magna. semi-static test. 21 d. number of offspring. 10 mg/l

**Graphite**

**Acute toxicity to algae/aquatic plants**

NOEC. 72 Hour. >= 100 mg/l. OECD Test Guideline 201

**Toxicity to bacteria**

EC50. 3 Hour. > 1,012.5 mg/l. OECD Test Guideline 209

**Molybdenum disulfide**

**Acute toxicity to fish**

Material is not classified as dangerous to aquatic organisms (LC50/EC50/IC50/LL50/EL50 greater than 100 mg/L in most sensitive species).

For similar material(s):

LC50. Fish. 96 Hour. > 100 mg/l

**Acute toxicity to aquatic invertebrates**

Based on data from similar materials

EC50. Daphnia magna (Water flea). 48 Hour. > 100 mg/l

**Acute toxicity to algae/aquatic plants**

Based on data from similar materials

ErC50. algae. 72 Hour. Growth rate. > 100 mg/l

**Toxicity to bacteria**

EC50. 30 Hour. Respiration rates.. > 100 mg/l

**Chronic toxicity to fish**

Based on data from similar materials

NOEC. Fish. 34 d. > 10 mg/l

**Chronic toxicity to aquatic invertebrates**

Based on data from similar materials  
NOEC. Daphnia magna. 21 d. > 10 mg/l

**Persistence and degradability**

**Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts**

**Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Based on data from similar materials 10-day Window: Fail

**Biodegradation:** 1.5 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B

**Distillates (petroleum), hydrotreated heavy naphthenic**

**Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

10-day Window: Fail

**Biodegradation:** 6 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B or Equivalent

10-day Window: Fail

**Biodegradation:** 22 - 51 %

**Exposure time:** 21 - 28 d

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitization:** OH radicals

**Solvent dewaxed heavy paraffinic distillates**

**Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Fail

**Biodegradation:** 2 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301B

**Lithium 12-hydroxyoctadecanoate**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

**Biodegradation:** 78 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301C

**Solvent dewaxed residual oil (petroleum)**

**Biodegradability:** Based on information for a similar material: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

**Graphite**

**Biodegradability:** Not applicable

**Molybdenum disulfide**

**Biodegradability:** Biodegradability is not applicable to inorganic substances.

**Bioaccumulative potential**

**Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts**

**Bioaccumulation:** For similar material(s): Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** 0.69 OECD Test Guideline 107

**Distillates (petroleum), hydrotreated heavy naphthenic**

**Bioaccumulation:** Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

**Partition coefficient: n-octanol/water(log Pow):** 3.9 - 6 Estimated.

**Solvent dewaxed heavy paraffinic distillates**

**Bioaccumulation:** Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

**Partition coefficient: n-octanol/water(log Pow):** 3.9 - 6 Estimated.

**Lithium 12-hydroxyoctadecanoate**

**Bioaccumulation:** No relevant data found.

**Solvent dewaxed residual oil (petroleum)**

**Bioaccumulation:** No relevant data found.

**Graphite**

**Bioaccumulation:** Not applicable No relevant data found.

**Molybdenum disulfide**

**Bioaccumulation:** Partitioning from water to n-octanol is not applicable.

**Mobility in soil**

**Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts**

No specific, relevant data available for assessment.

**Distillates (petroleum), hydrotreated heavy naphthenic**

No data available.

**Solvent dewaxed heavy paraffinic distillates**

No relevant data found.

**Lithium 12-hydroxyoctadecanoate**

No relevant data found.

**Solvent dewaxed residual oil (petroleum)**

No relevant data found.

**Graphite**

No relevant data found.

**Molybdenum disulfide**

No relevant data found.

**Results of PBT and vPvB assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

**Other adverse effects**

**Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Distillates (petroleum), hydrotreated heavy naphthenic**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Solvent dewaxed heavy paraffinic distillates**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Lithium 12-hydroxyoctadecanoate**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Solvent dewaxed residual oil (petroleum)**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Graphite**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

**Molybdenum disulfide**

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

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### **13. DISPOSAL CONSIDERATIONS**

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**Disposal methods:**

Do not dump into any sewers, on the ground, or into any body of water. This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 2008/98/EC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required.

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### **14. TRANSPORT INFORMATION**

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**Classification for ROAD and Rail transport:**

Not regulated for transport

**Classification for SEA transport (IMO-IMDG):**

Not regulated for transport

**Transport in bulk  
according to Annex I or II  
of MARPOL 73/78 and the**

Consult IMO regulations before transporting ocean bulk

**IBC or IGC Code****Classification for AIR transport (IATA/ICAO):**

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

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## 15. REGULATORY INFORMATION

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### Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Listed in Regulation: Not applicable

Classification and labeling have been performed according to Regulation (EC) No 1272/2008.

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## 16. OTHER INFORMATION

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**Full text of H-Statements referred to under sections 2 and 3.**

H315	Causes skin irritation.
H318	Causes serious eye damage.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

**Revision**

Identification Number: 3272834 / A715 / Issue Date: 2022.07.15 / Version: 6.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ARE OEL	Abu Dhabi Emirate - EHSMS Manual, Volume 2, Environment, Health and Safety Protection Policies, Section 2, Part I: EEPP Air Quality Standards
TWA	8-hour, time-weighted average
Aquatic Chronic	Long-term (chronic) aquatic hazard
Eye Dam.	Serious eye damage
Skin Irrit.	Skin irritation

**Full text of other abbreviations**

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German

Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

#### **Information Source and References**

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

SPECIALTY ELECTRONIC MATERIALS SWITZERLAND GMBH urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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