



SAFETY DATA SHEET
DDP SPECIALTY ELECTRONIC MATERIALS
US 9, LLC

**Product name: MOLYKOTE® G-4700 Extreme Pressure
Synthetic Grease**

Issue Date: 04/23/2020

Print Date: 06/23/2023

DDP SPECIALTY ELECTRONIC MATERIALS US 9, LLC 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.

1. IDENTIFICATION

Product name: MOLYKOTE® G-4700 Extreme Pressure Synthetic Grease

Recommended use of the chemical and restrictions on use

Identified uses: Lubricants and lubricant additives

COMPANY IDENTIFICATION

DDP SPECIALTY ELECTRONIC MATERIALS
US 9, LLC
974 Centre Road
Wilmington DE 19805
UNITED STATES

Customer Information Number:

833-338-7668
SDSQuestion-NA@dupont.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 1-800-424-9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Label elements

GHS classification in accordance with 29 CFR 1910.1200

Eye irritation - Category 2A

Skin sensitisation - Category 1

Reproductive toxicity - Category 1B

Label elements

Hazard pictograms



Signal word: **DANGER!**

Hazards

May cause an allergic skin reaction.
Causes serious eye irritation.
May damage fertility or the unborn child.

Precautionary statements

Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Wash contaminated clothing before reuse.

Storage

Store locked up.

Disposal

Dispose of contents/ container to an approved waste disposal plant.

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Organic grease

This product is a mixture.

Component	CASRN	Concentration
Molybdenum disulfide	1317-33-5	>= 1.0 - <= 3.0 %

Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	68457-79-4	>= 0.5 - <= 1.5 %
Boric acid, potassium salt	12712-38-8	>= 0.41 - <= 0.51 %
Distillates, petroleum, solvent-refined heavy paraffinic	64741-88-4	>= 0.4 - <= 0.5 %
Distillates (petroleum), solvent-refined light paraffinic	64741-89-5	>= 0.4 - <= 0.5 %
Naphthenic acids	1338-24-5	>= 0.1 - <= 0.5 %

4. FIRST AID MEASURES

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: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

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.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water spray Alcohol-resistant foam Carbon dioxide (CO₂) Dry chemical

Unsuitable extinguishing media: None known.

Special hazards arising from the substance or mixture

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

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

Advice for firefighters

Fire Fighting Procedures: Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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.

6. ACCIDENTAL RELEASE MEASURES

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

Environmental precautions: Discharge into the environment must be avoided. 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.

7. HANDLING AND STORAGE

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 with local exhaust ventilation. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

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

Component	Regulation	Type of listing	Value
Molybdenum disulfide	OSHA Z-1	TWA total dust	15 mg/m3 , Molybdenum
	ACGIH	TWA Inhalable particulate matter	10 mg/m3 , Molybdenum
	ACGIH	TWA Respirable particulate matter	3 mg/m3 , Molybdenum
	CAL PEL	PEL Total dust	10 mg/m3 , Molybdenum
	CAL PEL	PEL respirable dust fraction	3 mg/m3 , Molybdenum
	Further information: (n): The concentration and percentage of the particulate used for this limit are determined from the fraction passing a size selector with the following characteristics: Aerodynamic Diameter in Micrometers (unit density sphere)..... Percent Passing Selector 0 100 1 97 2 91 3 74 4 50 5 30 6 17 7 9 8 5 10 1		
Distillates, petroleum, solvent-refined heavy paraffinic	OSHA Z-1	TWA Mist	5 mg/m3
	ACGIH		See Further information
	Further information: URT irr: Upper Respiratory Tract irritation; L: Exposure by all routes should be carefully controlled to levels as low as possible.; A2: Suspected human carcinogen		
	ACGIH	TWA Inhalable particulate matter	5 mg/m3
	Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen		
	ACGIH		See Further information
	Further information: URT irr: Upper Respiratory Tract irritation; L: Exposure by all routes should be carefully controlled to levels as low as possible.; A2: Suspected human carcinogen		
	CAL PEL	PEL particulate	5 mg/m3
	Further information: (I): As sampled by method that does not collect vapor.		
	NIOSH REL	TWA Mist	5 mg/m3
	NIOSH REL	ST Mist	10 mg/m3
Distillates (petroleum), solvent-refined light paraffinic	OSHA Z-1	TWA Mist	5 mg/m3

	ACGIH	TWA Inhalable particulate matter	5 mg/m3
	Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen		
	ACGIH		See Further information
	Further information: URT irr: Upper Respiratory Tract irritation; L: Exposure by all routes should be carefully controlled to levels as low as possible.; A2: Suspected human carcinogen		
	CAL PEL	PEL particulate	5 mg/m3
	Further information: (I): As sampled by method that does not collect vapor.		
	NIOSH REL	TWA Mist	5 mg/m3
	NIOSH REL	ST Mist	10 mg/m3

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.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). **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. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Grease
Color	dark grey
Odor	slight
Odor Threshold	No data available
pH	Not applicable
Melting point/range	No data available

Freezing point	No data available
Boiling point (760 mmHg)	Not applicable
Flash point	closed cup >230 °C (446 °F)
Evaporation Rate (Butyl Acetate = 1)	Not applicable
Flammability (solid, gas)	Not classified as a flammability hazard
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	0.87
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Dynamic Viscosity	Not applicable
Kinematic Viscosity	Not applicable
Explosive properties	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.
Molecular weight	No data available
Particle size	No data available

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

10. STABILITY AND REACTIVITY

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: Ethane. Ethylene. 1-Butene. Hexene. Propylene.

11. TOXICOLOGICAL INFORMATION

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:

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.

Acute inhalation toxicity

LC50, Rat, 4 Hour, dust/mist, > 2.82 mg/l 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.

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.

Boric acid, potassium salt

Acute oral toxicity

Single dose oral LD50 has not been determined.

Based on data from similar materials LD50, Rat, > 2,600 mg/kg OECD Test Guideline 401

Acute dermal toxicity

The dermal LD50 has not been determined.

Based on data from similar materials LD50, Rabbit, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

The LC50 has not been determined.

Based on data from similar materials LC50, Rat, 4 Hour, dust/mist, > 2.12 mg/l OECD Test Guideline 403

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.
May cause skin irritation due to mechanical abrasion.

Serious eye damage/eye irritation

Solid or dust may cause irritation or corneal injury due to mechanical action.

Sensitization

For similar material(s):
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)

Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

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

Carcinogenicity

For similar material(s): Did not cause cancer in laboratory animals.

Teratogenicity

In laboratory animals, boron compounds have caused birth defects only at doses toxic to the mother and have been toxic to the fetus at doses nontoxic to the mother.

Reproductive toxicity

In animal studies, boron compounds have been shown to interfere with fertility in males, and to a lesser degree in females.

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, solvent-refined heavy paraffinic

Acute oral toxicity

LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity

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

Acute inhalation toxicity

The LC50 has not been determined.

Skin corrosion/irritation

|| Prolonged contact may cause moderate skin irritation with local redness.
|| Repeated 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

For this family of materials, sensitization studies done in guinea pigs have been negative.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

No relevant data found.

Carcinogenicity

For similar material(s): Did not cause cancer in animal skin painting studies.

Teratogenicity

No relevant data found.

Reproductive toxicity

No relevant data found.

Mutagenicity

For similar material(s): In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative in some cases and positive in other cases.

Aspiration Hazard

May be fatal if swallowed and enters airways.

Distillates (petroleum), solvent-refined light paraffinic

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, > 5,000 mg/kg

Acute inhalation toxicity

LC50, Rat, male and female, 4 Hour, dust/mist, > 5.53 mg/l

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 this family of materials, sensitization studies done in guinea pigs have been negative.

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)

For this family of materials:

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

Liver

Carcinogenicity

No relevant information found.

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. For this family of materials: Animal genetic toxicity studies were negative.

Aspiration Hazard

May be fatal if swallowed and enters airways.

Naphthenic acids

Acute oral toxicity

LD50, Rat, male, > 5,000 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 severe skin irritation with pain and local redness.

Serious eye damage/eye irritation

May cause eye irritation.

May cause corneal injury.

Sensitization

For skin sensitization:

Has caused 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)

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

Teratogenicity

Available data are inadequate for evaluation of potential to cause fetotoxicity.

Reproductive toxicity

In animal studies, did not interfere with reproduction.

Mutagenicity

Based on information for a similar material: In vitro genetic toxicity studies were negative.

Aspiration Hazard

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

Carcinogenicity

Component

List

Classification

Distillates, petroleum, solvent-refined heavy paraffinic

IARC

Group 1: Carcinogenic to humans

Distillates (petroleum), solvent-refined light paraffinic

ACGIH

A2: Suspected human carcinogen

IARC

Group 1: Carcinogenic to humans

US NTP

Known to be human carcinogen

ACGIH

A2: Suspected human carcinogen

12. ECOLOGICAL INFORMATION

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

Toxicity

Molybdenum disulfide

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

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

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

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

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

Boric acid, potassium salt

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Based on data from similar materials

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 1,000 mg/l

Acute toxicity to aquatic invertebrates

For similar material(s):

EC50, Daphnia magna (Water flea), 48 Hour, > 1,000 mg/l

Acute toxicity to algae/aquatic plants

Based on data from similar materials

ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, > 120 mg/l

Based on data from similar materials

NOEC, Pseudokirchneriella subcapitata (green algae), 96 Hour, 120 mg/l

Toxicity to bacteria

Based on data from similar materials
NOEC, 3 Hour, 20 mg/l

Chronic toxicity to fish

Based on data from similar materials
NOEC, Pimephales promelas (fathead minnow), 32 d, 11.2 mg/l

Chronic toxicity to aquatic invertebrates

Based on data from similar materials
NOEC, Daphnia magna (Water flea), 14 d, 18 mg/l

Distillates, petroleum, solvent-refined heavy paraffinic

Acute toxicity to fish

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 1,000 mg/l

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, > 1,000 mg/l

Acute toxicity to algae/aquatic plants

EC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Biomass, > 1,000 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 fish

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

Chronic toxicity to aquatic invertebrates

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

Distillates (petroleum), solvent-refined light paraffinic

Acute toxicity to fish

Typical for this family of materials.
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
For this family of materials:
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates

For this family of materials:
EC50, Daphnia magna (Water flea), semi-static test, 48 Hour, > 100 mg/l

Naphthenic acids

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Lepomis macrochirus (Bluegill sunfish), 96 Hour, 5.6 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 20 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate, 30 mg/l

Persistence and degradability

Molybdenum disulfide

Biodegradability: Biodegradability is not applicable to inorganic substances.

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

Boric acid, potassium salt

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: 13 %

Exposure time: 28 d

Method: OECD Test Guideline 301D

Distillates, petroleum, solvent-refined heavy paraffinic

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

Distillates (petroleum), solvent-refined light paraffinic

Biodegradability: For this family of materials: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Fail

Biodegradation: 1.5 - 29 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

Naphthenic acids

Biodegradability: No relevant data found.

Bioaccumulative potential

Molybdenum disulfide

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

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

Boric acid, potassium salt

Bioaccumulation: Based on data from similar materials Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): -1.09

Bioconcentration factor (BCF): 8 Lepomis macrochirus (Bluegill sunfish)

Distillates, petroleum, solvent-refined heavy paraffinic

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.

Distillates (petroleum), solvent-refined light paraffinic

Bioaccumulation: For this family of materials: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).

Naphthenic acids

Bioaccumulation: No specific, relevant data available for assessment.

Bioconcentration factor (BCF): 2 Oncorhynchus mykiss (rainbow trout)

Mobility in soil

Molybdenum disulfide

No relevant data found.

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

No specific, relevant data available for assessment.

Boric acid, potassium salt

No relevant data found.

Distillates, petroleum, solvent-refined heavy paraffinic

No relevant data found.

Distillates (petroleum), solvent-refined light paraffinic

No relevant data found.

Naphthenic acids

No specific, relevant data available for assessment.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE

INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section 10 Regulatory Information, MSDS Section 15

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Environmentally hazardous substance, solid, n.o.s.(Naphthenic Acids)
UN number	UN 3077
Class	9
Packing group	III
Reportable Quantity	Naphthenic Acids

Classification for SEA transport (IMO-IMDG):

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Not regulated for transport Consult IMO regulations before transporting ocean bulk
---	---

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.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Serious eye damage or eye irritation
Respiratory or skin sensitisation

Reproductive toxicity

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Components	CASRN
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	68457-79-4

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103

Calculated RQ exceeds reasonably attainable upper limit.

Components	CASRN	RQ (RCRA Code)
Naphthenic acids	1338-24-5	100 lbs RQ

Pennsylvania Right To Know

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
1-Decene, homopolymer, hydrogenated	68037-01-4
Hydroxystearate sebacate lithium complexes	68815-49-6
Polybutene No aspiration hazard	9003-29-6
1-Butene, polymer with ethene	25087-34-7
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	68457-79-4
Distillates, petroleum, solvent-refined heavy paraffinic	64741-88-4
Distillates (petroleum), solvent-refined light paraffinic	64741-89-5
Distillates (petroleum), hydrotreated heavy naphthenic	64742-52-5

California Prop. 65

This product contains a chemical that is at or below California Propositions 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Flammability	Instability
2	1	0

HMIS

Health	Flammability	Physical Hazard
2*	1	0

* = Chronic Effects (See Hazards Identification)

Revision

Identification Number: 4027325 / A776 / Issue Date: 04/23/2020 / Version: 7.0

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)
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
NIOSH REL	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
PEL	Permissible exposure limit
ST	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
TWA	8-hour time weighted average

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; 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; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance 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.

DDP SPECIALTY ELECTRONIC MATERIALS US 9, LLC 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.

US