



# SAFETY DATA SHEET

DDP SPECIALTY ELECTRONIC MATERIALS  
US 9, LLC

Product name: MOLYKOTE® DX Paste

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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® DX Paste

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

### Hazard classification

GHS classification in accordance with 29 CFR 1910.1200

Specific target organ toxicity - repeated exposure - Category 2

### Label elements

Hazard pictograms



Signal word: **WARNING!**

**Hazards**

May cause damage to organs (small intestine) through prolonged or repeated exposure.

**Precautionary statements****Prevention**

Do not breathe dust.

**Response**

Get medical advice/ attention if you feel unwell.

**Disposal**

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

**Other hazards**

No data available

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

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**Chemical nature:** Inorganic and organic compounds, Mixture

This product is a mixture.

Component	CASRN	Concentration
Distillates (petroleum), hydrotreated heavy naphthenic	64742-52-5	>= 35.0 - <= 65.0 %
Solvent dewaxed heavy paraffinic distillates	64742-65-0	>= 4.0 - <= 6.0 %
Lithium 12-hydroxyoctadecanoate	7620-77-1	>= 2.0 - <= 4.0 %
N-Tallow Alkyltrimethylenediamine Oleate	61791-53-5	>= 2.0 - <= 4.0 %
Petroleum Distillates, Hydrotreated, Heavy Paraffinic	64742-54-7	>= 1.0 - <= 3.0 %
Zinc Oxide	1314-13-2	>= 1.0 - <= 3.0 %

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### 4. FIRST AID MEASURES

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**Description of first aid measures****General advice:**

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

**Eye contact:** Flush eyes with plenty of water; remove contact lenses after the first 1-2 minutes then continue flushing for several minutes. Only mechanical effects expected. If effects occur, consult a physician, preferably an ophthalmologist.

**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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**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:** Carbon oxides Oxides of phosphorus Fluorine compounds Nitrogen oxides (NO<sub>x</sub>)

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

**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. Wear neoprene gloves to prevent contact with hydrofluoric acid.

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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.

## 7. HANDLING AND STORAGE

**Precautions for safe handling:** Do not get on skin or clothing. Do not swallow. Avoid contact with eyes. 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. 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.

## 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
Distillates (petroleum), hydrotreated heavy naphthenic	OSHA Z-1	TWA Mist	5 mg/m <sup>3</sup>
	ACGIH	TWA Inhalable particulate matter	5 mg/m <sup>3</sup>
	Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen		
	CAL PEL	PEL particulate	5 mg/m <sup>3</sup>
Further information: (I): As sampled by method that does not collect vapor.			
Solvent dewaxed heavy paraffinic distillates	OSHA Z-1	TWA Mist	5 mg/m <sup>3</sup>
	ACGIH	TWA Inhalable particulate matter	5 mg/m <sup>3</sup>
	Further information: URT irr: Upper Respiratory Tract irritation; A4: Not classifiable as a human carcinogen		
	CAL PEL	PEL particulate	5 mg/m <sup>3</sup>
Further information: (I): As sampled by method that does not collect vapor.			
	NIOSH REL	TWA Mist	5 mg/m <sup>3</sup>
	NIOSH REL	ST Mist	10 mg/m <sup>3</sup>

	OSHA P0	TWA Mist	5 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		
Petroleum Distillates, Hydrotreated, Heavy 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		
	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
	OSHA P0	TWA Mist	5 mg/m3
Zinc Oxide	ACGIH	TWA Respirable particulate matter	2 mg/m3
	ACGIH	STEL Respirable particulate matter	10 mg/m3
	OSHA P0	TWA Total dust	10 mg/m3
	OSHA P0	TWA respirable dust fraction	5 mg/m3
	OSHA P0	TWA Fumes	5 mg/m3
	OSHA P0	STEL Fumes	10 mg/m3
	OSHA P0	STEL	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. Local exhaust ventilation may be necessary for some operations.

### Individual protection measures

**Eye/face protection:** Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear 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 handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Appearance

<b>Physical state</b>	paste
<b>Color</b>	white
<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 ( 392 °F)
<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>	1.14
<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:** Hexafluoroethane. Hydrogen Fluoride. 1,1,1,3,3,3-Hexafluoro-2-propanone. Carbonic difluoride. Carbon monoxide. Fluorinated hydrocarbons.

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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:**

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

**Acute oral toxicity**

LD50, Rat, > 5,000 mg/kg OECD Test Guideline 401

**Acute dermal toxicity**

LD50, Rabbit, > 5,000 mg/kg OECD Test Guideline 402

**Acute inhalation toxicity**

LC50, Rat, 4 Hour, dust/mist, > 5.53 mg/l OECD Test Guideline 403

**Skin corrosion/irritation**

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 (Repeated Exposure)**

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

**Carcinogenicity**

No relevant data found.

**Mutagenicity**

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.



**Aspiration Hazard**

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity 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.

**N-Tallow Alkyltrimethylenediamine Oleate**

**Acute oral toxicity**

LD50, Rat, > 5,000 mg/kg

**Acute dermal toxicity**

Based on data from similar materials LD50, Rat, > 2,000 mg/kg OECD Test Guideline 402

**Skin corrosion/irritation**

Based on data from similar materials

**Serious eye damage/eye irritation**

Based on data from similar materials

**Sensitization**

Based on data from similar materials

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

Based on data from similar materials

**Petroleum Distillates, Hydrotreated, Heavy Paraffinic**

**Acute oral toxicity**

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

**Acute dermal toxicity**

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

**Acute inhalation toxicity**

For this family of materials: LC50, Rat, 4 Hour, vapour, 2.18 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)**

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

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

For this family of materials:

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

Liver.

**Carcinogenicity**

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

**Aspiration Hazard**

May be fatal if swallowed and enters airways.

**Zinc Oxide**

**Acute oral toxicity**

LD50, Rat, > 5,000 mg/kg

**Acute dermal toxicity**

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

**Acute inhalation toxicity**

Exposure to metal oxide fumes may cause metal fume fever, characterized by influenza-like symptoms. Dust may cause irritation to upper respiratory tract (nose and throat).

LC50, Rat, 4 Hour, dust/mist, > 5.7 mg/l No deaths occurred at this concentration.

**Skin corrosion/irritation**

Prolonged contact is essentially nonirritating to skin.

**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)**

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 additional significant adverse effects.

**Carcinogenicity**

Available data are inadequate to evaluate carcinogenicity.

**Teratogenicity**

Did not cause birth defects in laboratory animals.

**Reproductive toxicity**

In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

**Mutagenicity**

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

**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****Distillates (petroleum), hydrotreated heavy naphthenic****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).  
LL50, Pimephales promelas (fathead minnow), 96 Hour, > 100 mg/l, OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**

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

**Acute toxicity to algae/aquatic plants**

EL50, Pseudokirchneriella subcapitata (green algae), 72 Hour, > 100 mg/l, OECD Test Guideline 201  
NOELR, Pseudokirchneriella subcapitata (green algae), 72 Hour, 100 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**

NOEC, 10 min, >= 1.93 mg/l

**Chronic toxicity to aquatic invertebrates**

NOELR, Daphnia magna (Water flea), 21 d, 10 mg/l

**Solvent dewaxed heavy paraffinic distillates****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).  
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 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), 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

**N-Tallow Alkyltrimethylenediamine Oleate**

**Acute toxicity to fish**

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).  
Based on data from similar materials  
LC50, Danio rerio (zebra fish), 96 Hour, > 0.1 - 1 mg/l, OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**

Based on data from similar materials  
EC50, Daphnia magna (Water flea), 48 Hour, > 0.1 - 1 mg/l

**Acute toxicity to algae/aquatic plants**

Based on data from similar materials  
EC50, 72 Hour, > 0.01 - 0.1 mg/l, OECD Test Guideline 201  
Based on data from similar materials  
NOEC, 72 Hour, > 0.01 - 0.1 mg/l, OECD Test Guideline 201

**Chronic toxicity to aquatic invertebrates**

Based on data from similar materials  
EC10, Daphnia (water flea), > 1 mg/l

**Petroleum Distillates, Hydrotreated, Heavy 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

**Acute toxicity to algae/aquatic plants**

NOELR, Pseudokirchneriella subcapitata (green algae), 72 Hour, >100, OECD Test Guideline 201

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, >100, OECD Test Guideline 201

**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**

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 10 mg/l

**Zinc Oxide**

**Acute toxicity to fish**

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50, Danio rerio (zebra fish), static test, 96 Hour, 1.55 mg/l

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), 48 Hour, 0.481 mg/l

**Acute toxicity to algae/aquatic plants**

IC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate, 0.136 mg/l

NOEC, Pseudokirchneriella subcapitata (green algae), 72 Hour, 0.024 mg/l

**Chronic toxicity to fish**

NOEC, Danio rerio (zebra fish), 32 d, mortality, >= 0.540 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 0.058 mg/l

**Persistence and degradability**

**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.

10-day Window: Fail

**Biodegradation:** 31 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301F

**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

**N-Tallow Alkyltrimethylenediamine Oleate**

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

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

**Biodegradation:** 65 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301D

**Petroleum Distillates, Hydrotreated, Heavy 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

**Zinc Oxide**

**Biodegradability:** Biodegradation is not applicable.

**Bioaccumulative potential**

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

**Bioaccumulation:** No relevant data found.

**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.

**N-Tallow Alkyltrimethylenediamine Oleate**

**Bioaccumulation:** No relevant data found.

**Petroleum Distillates, Hydrotreated, Heavy Paraffinic**

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

**Zinc Oxide**

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

**Mobility in soil**

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

No relevant data found.

**Solvent dewaxed heavy paraffinic distillates**

No relevant data found.

**Lithium 12-hydroxyoctadecanoate**

No relevant data found.



**N-Tallow Alkyltrimethylenediamine Oleate**

No relevant data found.

**Petroleum Distillates, Hydrotreated, Heavy Paraffinic**

No relevant data found.

**Zinc Oxide**

No data available.

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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. 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.

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**14. TRANSPORT INFORMATION**

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**DOT**

Not regulated for transport

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

<b>Proper shipping name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(N-Tallow Alkyltrimethylenediamine Oleate, Zinc oxide)
<b>UN number</b>	UN 3077
<b>Class</b>	9
<b>Packing group</b>	III
<b>Marine pollutant</b>	N-Tallow Alkyltrimethylenediamine Oleate, Zinc oxide
<b>Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code</b>	Consult IMO regulations before transporting ocean bulk

**Classification for AIR transport (IATA/ICAO):**

<b>Proper shipping name</b>	Environmentally hazardous substance, solid, n.o.s. (N-Tallow Alkyltrimethylenediamine Oleate, Zinc oxide)
<b>UN number</b>	UN 3077
<b>Class</b>	9
<b>Packing group</b>	III

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

Specific target organ toxicity (single or repeated exposure)

**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:

<b>Components</b>	<b>CASRN</b>
Zinc Oxide	1314-13-2

**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.

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**16. OTHER INFORMATION**

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**Hazard Rating System**

**NFPA**

<b>Health</b>	<b>Flammability</b>	<b>Instability</b>
1	1	0

**HMIS**

<b>Health</b>	<b>Flammability</b>	<b>Physical Hazard</b>
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2*	1	0
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\* = Chronic Effects (See Hazards Identification)

### Revision

Identification Number: 1288563 / A776 / Issue Date: 08/04/2022 / Version: 9.0

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 P0	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
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
STEL	Short-term exposure limit
TWA	8-hour time weighted average

### Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; 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; TECl - 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.

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.

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