



# SAFETY DATA SHEET

## DDP SPECIALTY ELECTRONIC MATERIALS US 9, LLC

**Product name:** MOLYKOTE® D-3484 Anti-Friction Coating

**Issue Date:** 05/07/2024

**Print Date:** 05/08/2024

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® D-3484 Anti-Friction Coating

**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

Flammable liquids - Category 3

Skin irritation - Category 2

Serious eye damage - Category 1

Specific target organ toxicity - single exposure - Category 3

### Label elements

#### Hazard pictograms



Signal word: **DANGER!**

**Hazards**

Flammable liquid and vapour.  
Causes skin irritation.  
Causes serious eye damage.  
May cause drowsiness or dizziness.

**Precautionary statements****Prevention**

Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.  
Keep container tightly closed.  
Ground/bond container and receiving equipment.  
Use explosion-proof electrical/ ventilating/ lighting equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
Avoid breathing spray.  
Wash skin thoroughly after handling.  
Use only outdoors or in a well-ventilated area.  
Wear protective gloves/ eye protection/ face protection.

**Response**

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.  
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/ doctor.  
If skin irritation occurs: Get medical advice/ attention.  
Take off contaminated clothing and wash before reuse.  
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

**Storage**

Store in a well-ventilated place. Keep container tightly closed.  
Store in a well-ventilated place. Keep cool.  
Store locked up.

**Disposal**

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

**Other hazards**

Static-accumulating flammable liquid.

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**3. COMPOSITION/INFORMATION ON INGREDIENTS**

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**Chemical nature:** Organic/Inorganic Coating

This product is a mixture.

**Component**

**CASRN**

**Concentration**

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|                      |           |                     |
|----------------------|-----------|---------------------|
| n-Butyl Acetate      | 123-86-4  | >= 29.0 - <= 43.0 % |
| Molybdenum disulfide | 1317-33-5 | >= 16.0 - <= 24.0 % |
| Butanol              | 71-36-3   | >= 9.0 - <= 13.0 %  |
| Graphite             | 7782-42-5 | >= 4.0 - <= 6.0 %   |
| Ethanol              | 64-17-5   | >= 1.7 - <= 2.3 %   |
| Isobutanol           | 78-83-1   | >= 0.75 - <= 1.01 % |
| Phenol               | 108-95-2  | >= 0.37 - <= 0.49 % |

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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:** Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

**Skin contact:** Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated leather items such as shoes, belts, and watchbands. 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.

**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:** Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. Maintain adequate ventilation and oxygenation of the patient. 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:** High volume water jet Do not use direct water stream.

**Special hazards arising from the substance or mixture**

**Hazardous combustion products:** Carbon oxides Sulphur oxides Metal oxides Silicon oxides

**Unusual Fire and Explosion Hazards:** Flash back possible over considerable distance. Exposure to combustion products may be a hazard to health. Vapours may form explosive mixtures with air.

**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 water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Do not use a solid water stream as it may scatter and spread fire.

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:** Remove all sources of ignition. 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. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained. Do not release the product to the aquatic environment

**Methods and materials for containment and cleaning up:** Non-sparking tools should be used. Soak up with inert absorbent material. Suppress (knock down) gases/vapours/mists with a water spray jet. Clean up remaining materials from spill with suitable absorbant. 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 breathe vapours or spray mist. Do not swallow. Do not get in eyes. Keep container tightly closed. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment. Non-sparking tools should be used. Handle in accordance with good industrial hygiene and safety practice.

Use with local exhaust ventilation. Use only in an area equipped with explosion proof exhaust ventilation. Ensure all equipment is electrically grounded before beginning transfer operations. This material can accumulate static charge due to its inherent physical properties and can therefore cause an electrical ignition source to vapors. In order to prevent a fire hazard, as bonding and grounding may be insufficient to remove static electricity, it is necessary to provide an inert gas purge before beginning transfer operations. Restrict flow velocity in order to reduce the accumulation of static electricity. Ground and bond container and receiving equipment.

**Conditions for safe storage:** Keep in properly labelled containers. Store locked up. Keep tightly closed. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations. Keep away from heat and sources of ignition.

Do not store with the following product types: Strong oxidizing agents. Organic peroxides. Flammable solids. Pyrophoric liquids. Pyrophoric solids. Self-heating substances and mixtures. Substances and mixtures, which in contact with water, emit flammable gases. Explosives. Gases. 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                    |
|----------------------------------------------------------------------------------------|------------|-----------------------------------|--------------------------|
| n-Butyl Acetate                                                                        | DUPONT AEL | AEL *                             | 50 ppm                   |
|                                                                                        | DUPONT AEL | STEL                              | 150 ppm                  |
|                                                                                        | OSHA Z-1   | TWA                               | 710 mg/m3 150 ppm        |
|                                                                                        | CAL PEL    | PEL                               | 710 mg/m3 150 ppm        |
|                                                                                        | CAL PEL    | STEL                              | 950 mg/m3 200 ppm        |
|                                                                                        | ACGIH      | TWA                               | 50 ppm                   |
|                                                                                        | ACGIH      | STEL                              | 150 ppm                  |
|                                                                                        | NIOSH REL  | TWA                               | 710 mg/m3 150 ppm        |
|                                                                                        | NIOSH REL  | ST                                | 950 mg/m3 200 ppm        |
| Molybdenum disulfide                                                                   | OSHA Z-1   | TWA total dust                    | 15 mg/m3 ,<br>Molybdenum |
|                                                                                        | ACGIH      | TWA Inhalable particulate matter  | 10 mg/m3 ,<br>Molybdenum |
|                                                                                        | ACGIH      | TWA Respirable particulate matter | 3 mg/m3 ,<br>Molybdenum  |
|                                                                                        | CAL PEL    | PEL Total dust                    | 10 mg/m3 ,<br>Molybdenum |
|                                                                                        | CAL PEL    | PEL respirable dust fraction      | 3 mg/m3 ,<br>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).....<br>Percent Passing Selector 0 ..... 100<br>1 ..... 97 2 ..... 91<br>3 ..... 74 4 ..... 50<br>5 ..... 30 6 ..... 17<br>7 ..... 9 8 ..... 5<br>10 ..... 1                                                                                        |                                   |                                     |
| Butanol    | DUPONT AEL                                                                                                                                                                                                                                                                                                                                                                                                            | AEL *                             | 20 ppm                              |
|            | DUPONT AEL                                                                                                                                                                                                                                                                                                                                                                                                            | STEL                              | 50 ppm                              |
|            | ACGIH                                                                                                                                                                                                                                                                                                                                                                                                                 | TWA                               | 20 ppm                              |
|            | OSHA Z-1                                                                                                                                                                                                                                                                                                                                                                                                              | TWA                               | 300 mg/m3 100 ppm                   |
|            | CAL PEL                                                                                                                                                                                                                                                                                                                                                                                                               | C                                 | 150 mg/m3 50 ppm                    |
|            | Further information: S: Skin                                                                                                                                                                                                                                                                                                                                                                                          |                                   |                                     |
|            | NIOSH REL                                                                                                                                                                                                                                                                                                                                                                                                             | C                                 | 150 mg/m3 50 ppm                    |
|            | Further information: skin: Potential for dermal absorption                                                                                                                                                                                                                                                                                                                                                            |                                   |                                     |
| Graphite   | OSHA Z-3                                                                                                                                                                                                                                                                                                                                                                                                              | TWA Dust                          | 15 Million particles per cubic foot |
|            | OSHA Z-1                                                                                                                                                                                                                                                                                                                                                                                                              | TWA total dust                    | 15 mg/m3                            |
|            | OSHA Z-1                                                                                                                                                                                                                                                                                                                                                                                                              | TWA respirable fraction           | 5 mg/m3                             |
|            | ACGIH                                                                                                                                                                                                                                                                                                                                                                                                                 | TWA Respirable particulate matter | 2 mg/m3                             |
|            | CAL PEL                                                                                                                                                                                                                                                                                                                                                                                                               | PEL Total dust                    | 10 mg/m3                            |
|            | CAL PEL                                                                                                                                                                                                                                                                                                                                                                                                               | PEL respirable dust fraction      | 5 mg/m3                             |
|            | 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).....<br>Percent Passing Selector 0 ..... 100<br>1 ..... 97 2 ..... 91<br>3 ..... 74 4 ..... 50<br>5 ..... 30 6 ..... 17<br>7 ..... 9 8 ..... 5<br>10 ..... 1 |                                   |                                     |
|            | CAL PEL                                                                                                                                                                                                                                                                                                                                                                                                               | PEL Respirable dust               | 2.5 mg/m3                           |
|            | NIOSH REL                                                                                                                                                                                                                                                                                                                                                                                                             | TWA Respirable                    | 2.5 mg/m3                           |
|            | OSHA P0                                                                                                                                                                                                                                                                                                                                                                                                               | TWA Total dust                    | 10 mg/m3                            |
|            | OSHA P0                                                                                                                                                                                                                                                                                                                                                                                                               | TWA respirable dust fraction      | 5 mg/m3                             |
|            | OSHA P0                                                                                                                                                                                                                                                                                                                                                                                                               | TWA respirable dust fraction      | 2.5 mg/m3                           |
| Ethanol    | DUPONT AEL                                                                                                                                                                                                                                                                                                                                                                                                            | AEL *                             | 1,000 ppm                           |
|            | ACGIH                                                                                                                                                                                                                                                                                                                                                                                                                 | TWA                               | 1,000 ppm                           |
|            | Further information: URT irr: Upper Respiratory Tract irritation                                                                                                                                                                                                                                                                                                                                                      |                                   |                                     |
|            | ACGIH                                                                                                                                                                                                                                                                                                                                                                                                                 | STEL                              | 1,000 ppm                           |
|            | Further information: URT irr: Upper Respiratory Tract irritation                                                                                                                                                                                                                                                                                                                                                      |                                   |                                     |
|            | OSHA Z-1                                                                                                                                                                                                                                                                                                                                                                                                              | TWA                               | 1,900 mg/m3 1,000 ppm               |
|            | CAL PEL                                                                                                                                                                                                                                                                                                                                                                                                               | PEL                               | 1,900 mg/m3 1,000 ppm               |
|            | NIOSH REL                                                                                                                                                                                                                                                                                                                                                                                                             | TWA                               | 1,900 mg/m3 1,000 ppm               |
| Isobutanol | Dow IHG                                                                                                                                                                                                                                                                                                                                                                                                               | TWA                               | 50 ppm                              |
|            | Dow IHG                                                                                                                                                                                                                                                                                                                                                                                                               | STEL                              | 75 ppm                              |

|        |                                                                                                       |       |                   |
|--------|-------------------------------------------------------------------------------------------------------|-------|-------------------|
|        | ACGIH                                                                                                 | TWA   | 50 ppm            |
|        | OSHA Z-1                                                                                              | TWA   | 300 mg/m3 100 ppm |
|        | OSHA P0                                                                                               | TWA   | 150 mg/m3 50 ppm  |
|        | CAL PEL                                                                                               | PEL   | 150 mg/m3 50 ppm  |
|        | NIOSH REL                                                                                             | TWA   | 150 mg/m3 50 ppm  |
| Phenol | DUPONT AEL                                                                                            | AEL * | 5 ppm             |
|        | ACGIH                                                                                                 | TWA   | 5 ppm             |
|        | Further information: A4: Not classifiable as a human carcinogen; Skin: Danger of cutaneous absorption |       |                   |
|        | OSHA Z-1                                                                                              | TWA   | 19 mg/m3 5 ppm    |
|        | Further information: X: Skin designation                                                              |       |                   |
|        | NIOSH REL                                                                                             | TWA   | 19 mg/m3 5 ppm    |
|        | Further information: skin: Potential for dermal absorption                                            |       |                   |
|        | NIOSH REL                                                                                             | C     | 60 mg/m3 15.6 ppm |
|        | Further information: skin: Potential for dermal absorption                                            |       |                   |

**Biological occupational exposure limits**

| Components | CAS-No.  | Control parameters | Biological specimen | Sampling time                                            | Permissible concentration | Basis     |
|------------|----------|--------------------|---------------------|----------------------------------------------------------|---------------------------|-----------|
| Phenol     | 108-95-2 | Phenol             | Urine               | End of shift (As soon as possible after exposure ceases) | 250 mg/g Creatinine       | ACGIH BEI |

**Exposure controls**

**Engineering measures:** Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

**Individual protection measures**

**Eye/face protection:** Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

**Skin protection**

**Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Neoprene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. 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, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

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

|                                        |                                                          |
|----------------------------------------|----------------------------------------------------------|
| Physical state                         | liquid                                                   |
| Color                                  | grey                                                     |
| Odor                                   | solvent-like                                             |
| Odor Threshold                         | No data available                                        |
| pH                                     | No data available                                        |
| Melting point/range                    | No data available                                        |
| Freezing point                         | No data available                                        |
| Boiling point (760 mmHg)               | > 35 °C ( > 95 °F)                                       |
| Flash point                            | <b>Pensky-Martens closed cup</b> 25.5 °C ( 77.9 °F)      |
| Evaporation Rate (Butyl Acetate = 1)   | No data available                                        |
| Flammability (solid, gas)              | Not applicable                                           |
| Lower explosion limit                  | No data available                                        |
| Upper explosion limit                  | No data available                                        |
| Vapor Pressure                         | No data available                                        |
| Relative Vapor Density (air = 1)       | No data available                                        |
| Relative Density (water = 1)           | 1.16                                                     |
| Water solubility                       | No data available                                        |
| Partition coefficient: n-octanol/water | No data available                                        |
| Auto-ignition temperature              | No data available                                        |
| Decomposition temperature              | No data available                                        |
| Kinematic Viscosity                    | > 20.5 mm <sup>2</sup> /s at 25 °C (77 °F)               |
| Explosive properties                   | Not explosive                                            |
| <br>                                   |                                                          |
| Oxidizing properties                   | The substance or mixture is not classified as oxidizing. |
| Molecular weight                       | No data available                                        |
| Particle size                          | Not applicable                                           |

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. When heated to temperatures above 150 °C (300 °F) in the presence of air, product can form formaldehyde vapours. Safe handling conditions may be maintained by keeping vapour concentrations within the occupational exposure limit for formaldehyde. Vapours may form explosive mixture with air. Flammable liquid and vapour.

**Conditions to avoid:** Heat, flames and sparks.

**Incompatible materials:** Oxidizing agents

**Hazardous decomposition products:** Phenol. Formaldehyde. Acetic acid. Benzene.

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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

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

Based on information for component(s):

LD50, Rat, > 5,000 mg/kg

As product: Single dose oral LD50 has not been determined.

#### Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin contact may result in absorption of harmful amounts.

Based on information for component(s):

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

As product: The dermal LD50 has not been determined.

#### Acute inhalation toxicity

Product test data not available. Refer to component data.

### Skin corrosion/irritation

Brief contact may cause skin irritation with local redness.

Prolonged contact may cause severe skin irritation with local redness and discomfort.

### 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.

Vapor may cause eye irritation experienced as mild discomfort and redness.

**Sensitization**

For some component(s):

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

Did not cause allergic skin reactions when tested in humans.

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

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

May cause drowsiness or dizziness.

Route of Exposure: Inhalation

Target Organs: Nervous system

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

Based on information for component(s):

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

Nasal tissue.

Butanol has been reported to cause eye effects (tearing, blurred vision, sensitivity to light, temporary corneal effects), hearing loss and vertigo.

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

**Carcinogenicity**

Ethanol when not consumed in an alcoholic beverage is not classifiable as a human carcinogen.

Epidemiology studies provide evidence that drinking of alcoholic beverages (containing ethanol) is associated with cancer, and IARC has classified alcoholic beverages as carcinogenic to humans.

**Teratogenicity**

Based on information for component(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

n-Butanol has caused birth defects and has been toxic to the fetus in laboratory animals at doses nontoxic to the mother. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

Phenol has been toxic to the fetus in laboratory animals at doses toxic to the mother. Birth defects (cleft palate) were seen in mice at maternally lethal doses. This is a common developmental abnormality in mice and is associated with stress to the maternal animals.

**Reproductive toxicity**

For some component(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. In animal studies, did not interfere with fertility.

**Mutagenicity**

For some component(s): In vitro genetic toxicity studies were negative. Animal 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.

**COMPONENTS INFLUENCING TOXICOLOGY:****n-Butyl Acetate****Acute inhalation toxicity**

The LC50 has not been determined.

**Molybdenum disulfide****Acute inhalation toxicity**

LC50, Rat, 4 Hour, dust/mist, > 2.82 mg/l No deaths occurred at this concentration.

**Butanol****Acute inhalation toxicity**

An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration. Central nervous system effects. Respiratory effects. LC50, Rat, 4 Hour, vapour, > 17.76 mg/l OECD Test Guideline 403

**Graphite****Acute inhalation toxicity**

An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration. LC50, Rat, 4 Hour, dust/mist, > 2 mg/l OECD Test Guideline 403

**Ethanol****Acute inhalation toxicity**

LC50, Rat, 4 Hour, vapour, 124.7 mg/l

**Isobutanol****Acute inhalation toxicity**

LC50, Rat, male and female, 6 Hour, vapour, > 28.2 mg/l

LC50, Rat, male and female, 4 Hour, vapour, > 8000 ppm

Prolonged excessive exposure may cause adverse effects. Vapor may cause irritation of the upper respiratory tract (nose and throat). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. May cause central nervous system effects.

**Phenol****Acute inhalation toxicity**

Excessive exposure may cause severe irritation to upper respiratory tract (nose and throat) and lungs. Prolonged excessive exposure may cause adverse effects. May cause pulmonary edema (fluid in the lungs.) May cause central nervous system effects. Effects may be delayed.

The LC50 has not been determined.

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**12. ECOLOGICAL INFORMATION**

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

**Toxicity****n-Butyl Acetate****Acute toxicity to fish**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 18 mg/l

**Acute toxicity to aquatic invertebrates**

LC50, Daphnia magna (Water flea), 48 Hour, 44 mg/l

**Acute toxicity to algae/aquatic plants**

ErC50, Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, 648 mg/l

**Toxicity to bacteria**

EC50, Bacteria, 16 Hour, > 1,000 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 21 d, 23 mg/l

**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

**Butanol****Acute toxicity to fish**

Pimephales promelas (fathead minnow), 96 Hour, 1,376 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), 48 Hour, 1,328 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

EC50, Raphidocelis subcapitata (freshwater green alga), 96 Hour, 225 mg/l, OECD Test Guideline 201

EC10, Raphidocelis subcapitata (freshwater green alga), 96 Hour, 134 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**

EC50, Pseudomonas putida, static test, 17 Hour, Growth inhibition, > 1,000 mg/l, DIN 38412

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 21 d, 4.1 mg/l

**Toxicity to Above Ground Organisms**

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

**Graphite**

**Acute toxicity to fish**

No toxicity at the limit of solubility

LC50, Danio rerio (zebra fish), 96 Hour, > 100 mg/l, OECD Test Guideline 203

**Acute toxicity to aquatic invertebrates**

No toxicity at the limit of solubility

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

**Acute toxicity to algae/aquatic plants**

EC50, Raphidocelis subcapitata (freshwater green alga), 72 Hour, > 100 mg/l, OECD Test Guideline 201

NOEC, Raphidocelis subcapitata (freshwater green alga), 72 Hour, >= 100 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**

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

**Ethanol**

**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), flow-through test, 96 Hour, 11,200 - 13,000 mg/l

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), 48 Hour, 5,414 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**

Ec50, Skeletonema costatum (marine diatom), 5 d, Biomass, 10,943 - 11,619 mg/l, OECD Test Guideline 201 or Equivalent

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 9 d, 9.6 mg/l

**Isobutanol**

**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, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 1,430 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia pulex (Water flea), static test, 48 Hour, 1,100 mg/l

**Acute toxicity to algae/aquatic plants**

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, 1,799 mg/l

**Toxicity to bacteria**

IC50, activated sludge, static test, 16 Hour, Growth inhibition, > 1,000 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 20 mg/l  
MATC (Maximum Acceptable Toxicant Level), Daphnia magna (Water flea), 21 d, number of offspring, 28 mg/l

**Phenol****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, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 Hour, 8.9 mg/l

**Acute toxicity to aquatic invertebrates**

LC50, Ceriodaphnia dubia (water flea), 48 Hour, 4.3 - 20 mg/l

**Acute toxicity to algae/aquatic plants**

EC50, Pseudokirchneriella subcapitata (microalgae), static test, 96 Hour, Growth inhibition (cell density reduction), 61.1 mg/l, Other guidelines

**Toxicity to bacteria**

EC50, activated sludge, 110 - 800 mg/l

**Chronic toxicity to fish**

NOEC, Fish, semi-static test, 60 d, 0.077 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC, Daphnia magna (Water flea), 16 d, 10 mg/l

**Persistence and degradability****n-Butyl Acetate**

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

10-day Window: Pass

**Biodegradation:** 83 %

**Exposure time:** 28 d

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

**Theoretical Oxygen Demand:** 2.20 mg/mg Estimated.

**Photodegradation****Sensitization:** OH radicals**Atmospheric half-life:** 2.32 d**Method:** Estimated.**Molybdenum disulfide****Biodegradability:** Biodegradability is not applicable to inorganic substances.**Butanol****Biodegradability:** Readily biodegradable.**Biodegradation:** 92 %**Exposure time:** 20 d**Theoretical Oxygen Demand:** 2.59 mg/mg Estimated.**Chemical Oxygen Demand:** 2.45 mg/mg Estimated.**Photodegradation****Test Type:** Half-life (indirect photolysis)**Sensitization:** OH radicals**Atmospheric half-life:** 55.9 Hour**Method:** Estimated.**Graphite****Biodegradability:** Not applicable**Ethanol****Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

**Biodegradation:** > 70 %**Exposure time:** 5 d**Method:** OECD Test Guideline 301D or Equivalent**Theoretical Oxygen Demand:** 2.08 mg/mg**Photodegradation****Test Type:** Half-life (indirect photolysis)**Sensitization:** OH radicals**Atmospheric half-life:** 2.99 d**Method:** Estimated.**Isobutanol****Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

**Biodegradation:** 70 - 80 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301D or Equivalent

10-day Window: Not applicable

**Biodegradation:** 90 %**Exposure time:** 14 d**Method:** OECD Test Guideline 301C or Equivalent

**Theoretical Oxygen Demand:** 2.59 mg/mg Estimated.

**Chemical Oxygen Demand:** 2.29 mg/mg Dichromate

**Biological oxygen demand (BOD)**

| Incubation Time | BOD       |
|-----------------|-----------|
| 5 d             | 64 - 69 % |
| 10 d            | 73 - 79 % |
| 20 d            | 72 - 81 % |

**Photodegradation**

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

**Sensitization:** OH radicals

**Atmospheric half-life:** 1.55 d

**Method:** Estimated.

**Phenol**

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

10-day Window: Not applicable

**Biodegradation:** 62 %

**Exposure time:** 100 Hour

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

10-day Window: Not applicable

**Biodegradation:** 85 %

**Exposure time:** 14 d

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

**Theoretical Oxygen Demand:** 2.38 mg/mg

**Photodegradation**

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

**Sensitization:** OH radicals

**Atmospheric half-life:** 3.8 Hour

**Method:** Estimated.

**Bioaccumulative potential**

**n-Butyl Acetate**

**Bioaccumulation:** Bioconcentration potential is low ( $BCF < 100$  or  $\log Pow < 3$ ).

**Partition coefficient: n-octanol/water(log Pow):** Pow: 3.2 at 25 °C Measured

**Bioconcentration factor (BCF):** 15 Fish Estimated.

**Molybdenum disulfide**

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

**Butanol**

**Bioaccumulation:** Bioaccumulation is unlikely.

**Partition coefficient: n-octanol/water(log Pow):** 1 at 25 °C

**Graphite**

**Bioaccumulation:** Not applicable Not applicable

**Ethanol**

**Bioaccumulation:** Bioaccumulation is unlikely. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** -0.31 Measured

**Isobutanol**

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

**Partition coefficient: n-octanol/water(log Pow):** 1 Measured

**Bioconcentration factor (BCF):** 2 Fish Estimated.

**Phenol**

**Partition coefficient: n-octanol/water(log Pow):** 1.5 at 25 °C

**Bioconcentration factor (BCF):** 10 - 39 Carassius auratus (goldfish) Measured

**Mobility in soil****n-Butyl Acetate**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 19 - 70 Estimated.

**Molybdenum disulfide**

No relevant data found.

**Graphite**

No relevant data found.

**Ethanol**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 1.0 Estimated.

**Isobutanol**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 2 Estimated.

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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

|                             |                                                     |
|-----------------------------|-----------------------------------------------------|
| <b>Proper shipping name</b> | Flammable liquids, n.o.s.(Ethanol, n-Butyl acetate) |
| <b>UN number</b>            | UN 1993                                             |
| <b>Class</b>                | 3                                                   |
| <b>Packing group</b>        | III                                                 |
| <b>Reportable Quantity</b>  | n-Butyl acetate, Butan-1-ol                         |

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

|                                                                                             |                                                        |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Proper shipping name</b>                                                                 | FLAMMABLE LIQUID, N.O.S.(Ethanol, n-Butyl acetate)     |
| <b>UN number</b>                                                                            | UN 1993                                                |
| <b>Class</b>                                                                                | 3                                                      |
| <b>Packing group</b>                                                                        | III                                                    |
| <b>Marine pollutant</b>                                                                     | No                                                     |
| <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> | Flammable liquid, n.o.s.(Ethanol, n-Butyl acetate) |
| <b>UN number</b>            | UN 1993                                            |
| <b>Class</b>                | 3                                                  |
| <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**

Flammable (gases, aerosols, liquids, or solids)  
Hazard not otherwise classified (physical hazards)  
Skin corrosion or irritation  
Serious eye damage or eye irritation  
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:

**Components**

**CASRN**

Butanol

71-36-3

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

Calculated RQ exceeds reasonably attainable upper limit.

**Components**

**CASRN**

**RQ (RCRA Code)**

Butanol

71-36-3

5000 lbs RQ

Butanol

71-36-3

100 lbs RQ (F003)

Xylene

1330-20-7

100 lbs RQ

Xylene

1330-20-7

100 lbs RQ (F003)

Ethylbenzene

100-41-4

1000 lbs RQ

Ethylbenzene

100-41-4

100 lbs RQ (F003)

Isobutanol

78-83-1

5000 lbs RQ

Isobutanol

78-83-1

100 lbs RQ (F005)

n-Butyl Acetate

123-86-4

5000 lbs RQ

**Pennsylvania Right To Know**

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

**Components**

**CASRN**

n-Butyl Acetate

123-86-4

Molybdenum disulfide

1317-33-5

Butanol

71-36-3

Ethoxy-1-methylethyl acetate

54839-24-6

Phenol, formaldehyde Resin

Not applicable

Phenol, polymer with formaldehyde

9003-35-4

Graphite

7782-42-5

Polyvinyl acetate

9003-20-7

Ethanol

64-17-5

Isobutanol

78-83-1

Formaldehyde

50-00-0

**California Prop. 65**

WARNING: This product can expose you to chemicals including Formaldehyde, Ethylbenzene, which is/are known to the State of California to cause cancer. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**United States TSCA Inventory (TSCA)**

The product contains an intentional component that is subject to a restriction. Production and/or use is limited by the conditions of the restriction.

## 16. OTHER INFORMATION

### Hazard Rating System

#### NFPA

| Health | Flammability | Instability |
|--------|--------------|-------------|
| 3      | 3            | 0           |

#### HMIS

| Health | Flammability | Physical Hazard |
|--------|--------------|-----------------|
| 3/     | 3            | 0               |

### Revision

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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)                                                 |
| ACGIH BEI  | ACGIH - Biological Exposure Indices (BEI)                                               |
| AEL *      | 8 & 12 hr. TWA                                                                          |
| C          | Ceiling                                                                                 |
| CAL PEL    | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
| Dow IHG    | Dow Industrial Hygiene Guideline                                                        |
| DUPONT AEL | DuPont AEL (Acceptable Exposure Limit)                                                  |
| 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        |
| OSHA Z-3   | USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts                      |
| 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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