SAFETY DATA SHEET

Molylube Shovel & Dragline Lubricant Medium

Section 1. Identification

GHS product identifier : Molylube Shovel & Dragline Lubricant Medium

Product code : 301755150002

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Lubricating Oil

Uses advised against
Not applicable.

Supplier's details : Calumet Branded Products, LLC
1060 N Capitol Ave Suite 6-401
Indianapolis, IN 46204
USA
Technical Services:317-328-5660

Emergency telephone number (with hours of operation) : 24 hr. CHEMTREC 1-800-424-9300 / International 1-703-527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN SENSITIZATION - Category 1
AQUATIC HAZARD (ACUTE) - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 3

Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5%

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : May cause an allergic skin reaction.
Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention : Wear protective gloves. Avoid release to the environment. Avoid breathing vapor. Contaminated work clothing must not be allowed out of the workplace.

Response : IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice or attention. Take off contaminated clothing and wash it before reuse.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 2. Hazards identification

Hazards identified when used : No known significant effects or critical hazards.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

Ingredient name	Synonyms	%	Identifiers
Residual oils (petroleum), solvent-dewaxed	Baseoil - unspecified; Residual oils, petroleum, solvent, dewaxed; Residual oils, petroleum, solvent-dewaxed; Residual oils (petroleum) solvent dewaxed; OILS, PETROLEUM, RESIDUAL, SOLVENT DEWAXED; RESIDUAL OIL (PETROLEUM), SOLVENT-DEWAXED HEAVY PARAFFINIC; RESIDUAL OIL (PETROLEUM), SOLVENT-DEWAXED; OILS, RESIDUAL, SOLVENT-DEWAXED; SOLVENT-DEWAXED RESIDUAL OIL; Residual oils (petroleum), solvent-dewaxed, Baseoil - unspecified; Residual oils (petroleum), solvent dewaxed	≥65 - ≤85	CAS: 64742-62-7
Petroleum resins	Hydrocarbon resin, postpolymerised with maleic anhydride; Arien; Petroleum resin; Petroleum resin {C4-5 hydrocarbon-(styrene,alpha-methylstyrene,vinyltoluene) copolymer}; CRAON 17-505; HYDROCARBON RESIN; NEOPOLYMER (PETROLEUM RESIN); HYDROCARBON RESIN/PETROLEUM RESINS; PETROLEUM HYDROCARBON RESIN	≥10 - ≤30	CAS: 64742-16-1
Natural graphite	Graphite, natural, respirable dust; Graphite (Natural); GRAPHITE NATURAL; Stove black; Silver graphite; Plumbago; Mineral carbon; Black lead; Graphite - All forms except graphite fibres	≥7 - ≤13	CAS: 7782-42-5
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	1,3,4-Thiadiazole-2(3H)-thione, 5,5'-dithiobis-; Vanlube 829; Di (5-mercapto-1,3,4-thiadiazol-2-yl) disulfide; THIADIZOLE(1,3,4)-2 (3H)-THIONE, 5,5'-DITHIOBIS-; 5-[(5-sulfanylidene-4,5-dihydro-1,3,4-thiadiazol-2-yl)disulfanyl] -2,3-dihydro-1,3,4-thiadiazole-2-thione; 5,5''-Dithiodi-1,3,4-thiadiazole-2(3H)-thione	≥3 - ≤7	CAS: 72676-55-2
carbon black, non respirable	Lampblack; Acetylene black; C.I. 77266; C.I. Pigment Black 6; C.I.	≥3 - ≤7	CAS: 1333-86-4

Section 3. Composition/information on ingredients

	Pigment Black 7; Charcoal		
Fatty acids, tallow, hydrogenated, reaction products with aluminum isopropoxide and benzoic acid	Fatty acids, tallow, hydrogenated, reaction products with aluminium isopropoxide and benzoic acid; Fatty acids, tallow, hydrogenated, aluminium hydroxy, benzoate complex salt; Fatty acids, tallow, hydrogenated reaction products with aluminum isopropoxide and benzoic acid	≥3 - ≤7	CAS: 68201-44-5
Phosphorodithioic acid, mixed O,O-bis (iso-Bu and pentyl) esters, zinc salts	Phosphorodithioic acid, mixed O, O-bis(isobutyl and pentyl) esters, zinc salts; Phosphorodithioic acid, mixed O,O-bis(2-methylpropyl and pentyl) esters, zinc salt; Zinc dialkyl dithiophosphorate; Dithiophosphoric acid, O,O'-isobutyl amyl ester, zinc salt; Zinc, dithiophosphate mixed iso-Bu and pentyl esters; Zinc dialkyl (C3-6) dithiophosphate; Phosphorodithioic acid O,O-bis (mixed iso-Bu and pentyl) esters zinc salts; Phosphorodithioic acid, mixed O,O-bis(iso-butyl and pentyl) esters, zinc salts; MIXED ESTER, PHOSPHORODITHIOIC ACID, O,O-BIS(ISO-BU AND PENTYL), ZINC SALTS; zinc dialkyl dithiophosphate; zinc mixed O,O-bis(iso-butyl and pentyl)phosphorodithioic acid	≥1 - ≤5	CAS: 68457-79-4
molybdenum disulphide	Molybdenum sulfide (MoS2); Molybdenum sulfide; molybdenum disulfide; C.I. 77770; C.I. Pigment Black 34; MOLYBDENUM (IV) SULFIDE	≥0.5 - ≤1.5	CAS: 1317-33-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Section 4. First aid measures

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
metal oxide/oxides

Section 5. Fire-fighting measures

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Residual oils (petroleum), solvent-dewaxed	**NIOSH REL (United States, 10/2020) [OIL MIST MINERAL]** TWA 10 hours: 5 mg/m³. Form: Mist. STEL 15 minutes: 10 mg/m³. Form: Mist. **OSHA PEL (United States, 5/2018) [Oil mist, mineral]** TWA 8 hours: 5 mg/m³. **ACGIH TLV (United States, 1/2025) [Mineral Oil, pure, highly and severely refined]** A4. TWA 8 hours: 5 mg/m³. Form: Inhalable fraction.
Petroleum resins	None.
Natural graphite	**NIOSH REL (United States, 10/2020)** TWA 10 hours: 2.5 mg/m³. Form: Respirable fraction. **CAL OSHA PEL (United States, 1/2025)** TWA 8 hours: 2.5 mg/m³. Form: respirable dust. **OSHA PEL Z3 (United States, 6/2016)** TWA 8 hours: 15 mppcf. **OSHA PEL (United States, 5/2018)** TWA 8 hours: 15 mg/m³. Form: Total dust. TWA 8 hours: 5 mg/m³. Form: Respirable fraction. **OSHA PEL 1989 (United States, 3/1989)** TWA 8 hours: 2.5 mg/m³. Form: Respirable dust. **ACGIH TLV (United States, 1/2025)** TWA 8 hours: 2 mg/m³. Form: Respirable fraction.
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	None.
carbon black, non respirable	**NIOSH REL (United States, 10/2020)** NIA. TWA 10 hours: 3.5 mg/m³. TWA 10 hours: 0.1 mg/m³ (as cyclohexane-extractable fraction). **CAL OSHA PEL (United States, 1/2025)** TWA 8 hours: 3.5 mg/m³. **OSHA PEL (United States, 5/2018)** TWA 8 hours: 3.5 mg/m³. **OSHA PEL 1989 (United States, 3/1989)** TWA 8 hours: 3.5 mg/m³. **ACGIH TLV (United States, 1/2025)** A3. TWA 8 hours: 3 mg/m³. Form: Inhalable fraction.
Fatty acids, tallow, hydrogenated, reaction products with aluminum isopropoxide and benzoic acid	**NIOSH REL (United States, 10/2020) [aluminum soluble salts and alkyls]** TWA 10 hours: 2 mg/m³ (as Al). **CAL OSHA PEL (United States, 1/2025) [aluminum soluble salts]** TWA 8 hours: 2 mg/m³. **OSHA PEL 1989 (United States, 3/1989) [Aluminum (as Al) Metal, Soluble salts]** TWA 8 hours: 2 mg/m³ (as Al).
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	None.
molybdenum disulphide	**CAL OSHA PEL (United States, 1/2025)**

Section 8. Exposure controls/personal protection

	[molybdenum, insoluble compounds] TWA 8 hours: 3 mg/m³ (as Mo). Form: respirable fraction. TWA 8 hours: 10 mg/m³ (as Mo). Form: total dust. TWA 8 hours: 0.5 mg/m³ (as Mo). **OSHA PEL (United States, 5/2018) [Molybdenum Insoluble Compounds]** TWA 8 hours: 15 mg/m³ (as Mo). Form: Total dust. **OSHA PEL 1989 (United States, 3/1989) [Molybdenum (as Mo) insoluble compounds]** TWA 8 hours: 10 mg/m³ (as Mo). Form: Total dust. **ACGIH TLV (United States, 1/2025) [Molybdenum, Metal and insoluble compounds]** TWA 8 hours: 10 mg/m³ (as Mo). Form: Inhalable fraction. TWA 8 hours: 3 mg/m³ (as Mo). Form: Respirable fraction.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state : Liquid. [Viscous liquid. Paste.]

Color : Black.

Odor : Not available.

Odor threshold : Not available.

pH : Not available.

Melting point/freezing point : Not available.

Boiling point or initial boiling point and boiling range : Not available.

Flash point : Closed cup: 288°C (550.4°F) [Pensky-Martens]

Evaporation rate : Not available.

Flammability : Not available.

Lower and upper explosion limit/flammability limit : Not available.

Vapor pressure :

Ingredient name	Vapor Pressure at 20˚C			Vapor pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Residual oils (petroleum), solvent-dewaxed	<0.07501	<0.01	ASTM D 5191			

Relative vapor density : Not available.

Relative density : 0.97

Solubility(ies) :

Media	Result
cold water	Not soluble
hot water	Not soluble

Solubility in water : Not available.

Partition coefficient: n-octanol/water : Not applicable.

Auto-ignition temperature :

Ingredient name	°C	°F	Method
Natural graphite	>400	>752	EN 50281-2-1

Decomposition temperature : Not available.

Viscosity : Dynamic (room temperature): Not available.
Kinematic (room temperature): Not available.
Kinematic (40°C (104°F)): Not applicable.

Particle characteristics

Median particle size : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result
Residual oils (petroleum), solvent-dewaxed	**Rat - Oral - LD50** >5000 mg/kg **Rabbit - Dermal - LD50** >2000 mg/kg **Rat - Inhalation - LC50 Dusts and mists** >5.53 mg/l [4 hours]
Petroleum resins	**Rat - Oral - LD50** 2000 mg/kg
Natural graphite	**Rat - Oral - LD50** >2000 mg/kg **Rat - Inhalation - LC50 Vapor** >2000 mg/m³ [4 hours]
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	**Rabbit - Dermal - LD50** >2000 mg/kg **Rat - Oral - LD50** >2000 mg/kg
carbon black, non respirable	**Rat - Oral - LD50** >15400 mg/kg Toxic effects: Behavioral - Somnolence (general depressed activity) **Rabbit - Dermal - LD50** 3000 mg/kg
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	**Rat - Oral - LD50** 3.6 g/kg Toxic effects: Behavioral - Somnolence (general depressed activity) Lung, Thorax, or Respiration - Other changes Gastrointestinal - Hypermotility, diarrhea **Rabbit - Dermal - LD50** 20000 mg/kg OECD [Acute Dermal Toxicity]
molybdenum disulphide	**Rat - Oral - LD50** 5000 mg/kg **Rat - Dermal - LD50** >2000 mg/kg **Rat - Inhalation - LC50 Vapor** >5.1 mg/l [4 hours]

Conclusion/Summary [Product] : Not available.

Ingredient name **Conclusion/Summary**

Section 11. Toxicological information

Natural graphite	No known significant effects or critical hazards. Inhalation exposure is considered to be not relevant.

Skin corrosion/irritation

Product/ingredient name	Result
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	**Rat - Skin - Moderate irritant** OECD [Acute Dermal Irritation/Corrosion] Duration of treatment/exposure: 4 hours

Conclusion/Summary [Product] : Not available.

Serious eye damage/eye irritation

Product/ingredient name	Result
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	**Rabbit - Eyes - Severe irritant** OECD [Acute Eye Irritation/Corrosion]

Conclusion/Summary [Product] : Not available.

Respiratory corrosion/irritation

Not available.

Conclusion/Summary [Product] : Not available.

Respiratory or skin sensitization

Product/ingredient name	Result
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	**Mouse - skin** Result: Sensitizing
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	**Guinea pig - Respiratory** OECD [Skin Sensitization] Result: Not sensitizing

Skin

Conclusion/Summary [Product] : Not available.

Respiratory

Conclusion/Summary [Product] : Not available.

Germ cell mutagenicity

Product/ingredient name	Result
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	**In vitro - Mammalian-Animal** OECD [In vitro Mammalian Cell Gene Mutation Test] Result: Positive **In vitro - Bacteria** OECD [Bacterial Reverse Mutation Test] Result: Negative **In vitro - Mammalian-Animal** OECD [In vitro Micronucleus Test] Result: Negative

Conclusion/Summary [Product] : Not available.

Carcinogenicity

Section 11. Toxicological information

Not available.

Conclusion/Summary [Product] : Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
carbon black, non respirable	-	2B	-

Reproductive toxicity

Product/ingredient name	Result
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	**Rat - Oral** 300 mg/kg [47 days]

Conclusion/Summary [Product] : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Section 11. Toxicological information

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Result
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	**Sub-acute - Rat - Oral - NOAEL** 1000 mg/kg [14 days]

Conclusion/Summary [Product] : Not available.

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
Residual oils (petroleum), solvent-dewaxed	N/A	2500	N/A	N/A	N/A
Petroleum resins	2000	N/A	N/A	N/A	N/A
Natural graphite	2500	N/A	N/A	N/A	N/A
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	2500	2500	N/A	N/A	N/A
carbon black, non respirable	N/A	3000	N/A	N/A	N/A
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	3600	20000	N/A	N/A	N/A
molybdenum disulphide	5000	2500	N/A	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result
Residual oils (petroleum), solvent-dewaxed	**Acute - LC50** Fish >100 mg/l [96 hours] **Acute - EC50** Crustaceans >100 mg/l [48 hours] **Acute - EC50** Algae >100 mg/l [72 hours]
Petroleum resins	**Acute - EC50** Daphnia 100 mg/l [48 hours] **EC50** Algae 100 mg/l [72 hours]
Natural graphite	**Acute - LC50** Fish >100 mg/l [96 hours] **Acute - NOEC** Fish >100 mg/l [96 hours]

Section 12. Ecological information

5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	**Acute - EC10** Algae 9.4 mg/l [72 hours] **Acute - EC50** Algae 20 mg/l [72 hours] **Acute - EC50** Daphnia 3 mg/l [48 hours] **Acute - EC50** Fish >454 mg/l [96 hours]
carbon black, non respirable	**Acute - EC50 - Fresh water** OECD Daphnia - Water flea - *Daphnia magna* - Neonate Age: <24 hours 37.563 mg/l [48 hours] Effect: Intoxication
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	**LC50** Fish 4.5 mg/l [4 days] **NOEC** Fish 46 mg/l [4 days] **EC50** Daphnia 23 mg/l [2 days] **NOEC** Daphnia 10 mg/l [2 days] **EC50** Aquatic plants 24 mg/l [3 days] **NOEC** Aquatic plants 10 mg/l [3 days]

Conclusion/Summary [Product] : Not available.

Ingredient name	Conclusion/Summary
Natural graphite molybdenum disulphide	No known significant effects or critical hazards. The risks to the environment for the preparation itself are not available because of a lack of calculation methods.

Persistence and degradability

Product/ingredient name	Result
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	OECD [Ready Biodegradability - CO_2 Evolution Test] 0% [28 days] - Not readily
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	OECD [Ready Biodegradability - CO_2 Evolution Test] 1.5% [28 days]

Conclusion/Summary [Product] : Not available.

Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Residual oils (petroleum), solvent-dewaxed	-	-	Inherent
5,5'-dithiodi-1,3,4-thiadiazole-2(3H)-thione	-	-	Not readily
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	-	-	Not readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Residual oils (petroleum), solvent-dewaxed	>6	-	High
Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	0.69	-	Low

Mobility in soil

Soil/Water partition coefficient : Not available.

Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name			-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

Section 14. Transport information

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

Clean Water Act (CWA) 307: Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts

TSCA 12(b) - Chemical export notification

Not applicable.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : SKIN SENSITIZATION - Category 1

Composition/information on ingredients

Name	%	Classification
Petroleum resins	≥10 - ≤30	ACUTE TOXICITY (oral) - Category 4
5,5'-dithiodi-1,3,4-thiadiazole-2 (3H)-thione	≥3 - ≤7	SKIN SENSITIZATION - Category 1
carbon black, non respirable	≥3 - ≤7	CARCINOGENICITY - Category 2
Phosphorodithioic acid, mixed O, O-bis(iso-Bu and pentyl) esters, zinc salts	≥1 - ≤5	SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	68457-79-4	≥1 - ≤5
Supplier notification	Phosphorodithioic acid, mixed O,O-bis(iso-Bu and pentyl) esters, zinc salts	68457-79-4	≥1 - ≤5

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: OIL MIST, MINERAL; GRAPHITE (NATURAL) DUST; CARBON BLACK; MOLYBDENUM DISULFIDE

Section 15. Regulatory information

New York : None of the components are listed.

New Jersey : The following components are listed: GRAPHITE (NATURAL); CARBON BLACK; ZINC compounds

Pennsylvania : The following components are listed: GRAPHITE; CARBON BLACK; ZINC COMPOUNDS

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : All components are listed or exempted.

Canada : At least one component is not listed in DSL but all such components are listed in NDSL.

China : All components are listed or exempted.

Eurasian Economic Union : **Russian Federation inventory**: Not determined.

Japan : **Japan inventory (CSCL)**: Not determined.
Japan inventory (ISHL): Not determined.

New Zealand : All components are listed or exempted.

Philippines : All components are listed or exempted.

Republic of Korea : All components are listed or exempted.

Taiwan : All components are listed or exempted.

Thailand : Not determined.

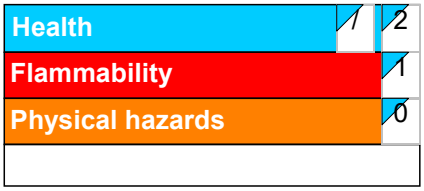
Turkey : Not determined.

United States : All components are active or exempted.

Viet Nam : All components are listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

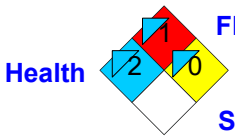


Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Section 16. Other information

National Fire Protection Association (U.S.A.)



Procedure used to derive the classification

Classification	Justification
SKIN SENSITIZATION - Category 1	Calculation method
AQUATIC HAZARD (ACUTE) - Category 3	Calculation method
AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method

History

Date of printing : 12/1/2025

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Date of previous issue : 9/10/2024

Version : 4

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
DOT = Department of Transportation
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
IMO = International Maritime Organization
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
TDG = Transportation of Dangerous Goods
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

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