



Safety Data Sheet

HiTEC® 352 Performance Additive

SDS no. H352

Section 1. Identification

Product identifier : HiTEC® 352 Performance Additive
Product use : Petrochemical industry: Industrial Gear Additive
Date of issue/Revisions : 30 November 2023

In case of emergency - Chemical

+1-703-527-3887 (International)
+65-3158-1349 (Asia Pacific)
+61-290372994 (Australia)
4001-204937 (China)
+81-345209637 (Japan)
00-308-13-2549 (South Korea)
+1-703-741-5979 (Spanish language)
+44-870-8200418 (UK)
1-800-424-9300 (US & Canada)

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Section 2. Hazards identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 4
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A
SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2
LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : Combustible liquid.
Causes skin irritation.
Causes serious eye irritation.
Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : Wear protective gloves, protective clothing and eye or face protection. Keep away from flames and hot surfaces. No smoking. Avoid release to the environment. Wash thoroughly after handling.

Response : Collect spillage. Take off contaminated clothing and wash it before reuse. IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention. In case of fire, use water spray (fog), foam, dry chemical or CO₂.

Storage : Store in a well-ventilated place. Keep cool.

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

Other hazards which do not result in classification : None known.

Please note some GHS hazard classifications listed above may not be applicable in your country or region and are shown for informational purposes only.

For other GHS hazard classifications not listed above, the classification is not applicable in your region.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Section 3. Composition/information on ingredients

Ingredient name	CAS number	%	GHS Classification	Type
1-Propene, 2-methyl-, sulfurized	68511-50-2	≥35 - ≤45	FLAMMABLE LIQUIDS - Category 4	[1]
Solvent naphtha (petroleum), heavy arom.	64742-94-5	≥10 - ≤15	ASPIRATION HAZARD - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2	[1]
Distillates (petroleum), hydrotreated heavy paraffinic	64742-54-7	≥10 - ≤15	Not classified.	[2]
2-methylnaphthalene	91-57-6	≥5 - ≤10	FLAMMABLE SOLIDS - Category 2 ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION/IRRITATION - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE (lungs) - Category 2 ASPIRATION HAZARD - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2	[1] [2]
Amines, C12-14-tert-alkyl	68955-53-3	≥3 - ≤5	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 2 SKIN CORROSION/IRRITATION - Category 1B SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SKIN SENSITISATION - Category 1A SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 (M=1) LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 (M=1)	[1]
1-methylnaphthalene	90-12-0	≥3 - ≤5	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION/IRRITATION - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	[1] [2]

Section 3. Composition/information on ingredients

			(Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE (lungs) - Category 2 ASPIRATION HAZARD - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2	
2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	89347-09-1	≥3 - ≤5	SKIN CORROSION/IRRITATION - Category 3 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 3 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3	[1]
Alkyl phosphonate	Proprietary	≥1 - ≤3	ACUTE TOXICITY (oral) - Category 5 ACUTE TOXICITY (dermal) - Category 5 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 3 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3	[1]
bis(2-ethylhexyl) hydrogen phosphate	298-07-7	≥1 - <2.7	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 5 SKIN CORROSION/IRRITATION - Category 1B SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 3	[1]
2-ethylhexyl dihydrogen phosphate	1070-03-7	≥1 - <2.2	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 5 SKIN CORROSION/IRRITATION - Category 1B SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 3	[1]
(Z)-octadec-9-enylamine	112-90-3	≥0.5 - <1	ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION/IRRITATION - Category 1B SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN	[1]

Section 3. Composition/information on ingredients

			TOXICITY - REPEATED EXPOSURE (gastrointestinal tract, immune system, liver) - Category 2 ASPIRATION HAZARD - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 (M=10) LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 (M=10)	
Alcohols, C12-16, ethoxylated	68551-12-2	≥0.5 - ≤0.95	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 (M=1) LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3	[1]
octylamine	111-86-4	≥0.3 - ≤0.5	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 1A SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 (M=1) LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2	[1]

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

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

Please note some GHS hazard classifications listed above may not be applicable in your country or region and are shown for informational purposes only.

Type

[1] Substance classified with a physical, health or environmental hazard

[2] Substance with a workplace exposure limit

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

: Immediately flush eyes with plenty of water for at least 15 minutes, 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.

Section 4. First aid measures

- Inhalation** : If inhaled, remove to fresh air. 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. If not breathing, give artificial respiration. If breathing is difficult, administer oxygen.
- Skin contact** : Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse. Continue to rinse for at least 15 minutes.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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** : Causes serious eye irritation.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Causes skin irritation. Defatting to the skin.
- Ingestion** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- 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.

Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media : In case of fire, use water spray (fog), foam, dry chemical or CO₂.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is toxic 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
phosphorus oxides
metal oxide/oxides

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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

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.

HazChem Code (Australia) : 3Z

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 spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised 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 spilt 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. Collect spillage.

Section 6. Accidental release measures

Methods and material for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry 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. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. 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 (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. 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 a segregated and approved area. 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. Eliminate all ignition sources. Separate from oxidising materials. 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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Distillates (petroleum), hydrotreated heavy paraffinic	<p>Safe Work Australia (Australia, 10/2022). [Oil mist, refined mineral] TWA: 5 mg/m³ 8 hours. Form: Mist</p> <p>Japan Society for Occupational Health (Japan, 9/2022). [Oil mist, mineral] OEL-M: 3 mg/m³ 8 hours. Form: Mist</p> <p>Workplace Safety and Health Act (Singapore, 2/2006). [Oil Mist, mineral] PEL (long term): 5 mg/m³ 8 hours. Form: Mist</p> <p>PEL (short term): 10 mg/m³ 15 minutes. Form: Mist</p>
2-methylnaphthalene	<p>Ministry of Employment and Labor (Republic of Korea, 1/2020). [Particulate polycyclic aromatic hydrocarbons (as benzene solubles)] TWA: 0.2 mg/m³, (as benzene solubles) 8 hours.</p>
1-methylnaphthalene	<p>Ministry of Employment and Labor (Republic of Korea, 1/2020). [Particulate polycyclic aromatic hydrocarbons (as benzene solubles)] TWA: 0.2 mg/m³, (as benzene solubles) 8 hours.</p>

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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. 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

Section 8. Exposure controls/personal protection

- Hand protection** : Hand Protection: Wear chemical resistant gloves. Nitrile gloves of minimum thickness 0.4 mm have an expected breakthrough time of 120 minutes or less when in frequent contact with the product. Due to variable exposure conditions the user must consider that the practical use of a chemical-protective glove in practice may be much shorter than the permeation time above. Manufacturer's directions for use, especially about the minimum thickness and the minimum breakthrough time, must be observed. This information does not replace suitability tests by the end user since glove protection varies depending on the conditions under which the product is used.
- 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.
- 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

- Physical state** : Liquid. [Clear.]
- Colour** : Amber.
- Odour** : Pungent.
- Odour threshold** : Not available.
- pH** : Not available.
- Melting point** : Not available.
- Boiling point** : Not available.
- Flash point** : Closed cup: 82°C (179.6°F) [Minimum Pensky-Martens]
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapour pressure** : Not available.
- Relative vapour density** : Not available.
- Vapour density** : Not available.
- Density** : 1.012 g/cm³ [59°F (15°C)]
- Relative density** : 1.014
- Solubility(ies)** : Not available.
- Partition coefficient: n-octanol/water** : Not applicable.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.

Section 9. Physical and chemical properties

Viscosity : Kinematic (40°C): 35 mm²/s (35 cSt) Minimum
4 cSt @ 100°C

Explosive properties : Not available.

Oxidising properties : Not available.

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 : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Reactive or incompatible with the following materials:
oxidising materials

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	Test	Result	Species	Dose	Exposure	Remarks
1-Propene, 2-methyl-, sulfurized Solvent naphtha (petroleum), heavy arom.	None available.	LC50 Inhalation Vapour	Rat	>0.39 mg/l	4 hours	-
	None available.	LC50 Inhalation Vapour	Rat	>2 mg/l	6 hours	-
	None available.	LD50 Dermal	Rabbit	>7940 mg/kg	-	-
	None available.	LD50 Oral	Rat	5700 mg/kg	-	-
	None available.	LD50 Oral	Rat	9800 mg/kg	-	-
	403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat	>4778 mg/m ³	4 hours	Based on data for a similar substance.
	403 Acute Inhalation Toxicity	LC50 Inhalation Vapour	Rat	>4688 mg/m ³	4 hours	Based on data for a similar substance.
	402 Acute Dermal Toxicity	LD50 Dermal	Rabbit	>2000 mg/kg	-	Based on data for a similar substance.
401 Acute Oral Toxicity	LD50 Oral	Rat	6318 mg/kg	-	Based on data for a similar substance.	

Section 11. Toxicological information

Distillates (petroleum), hydrotreated heavy paraffinic	403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat	>5.53 mg/l	4 hours	Based on data for a similar substance. Based on data for a similar substance. Based on data for a similar substance.
	402 Acute Dermal Toxicity	LD50 Dermal	Rabbit	>5000 mg/kg	-	
	401 Acute Oral Toxicity	LD50 Oral	Rat	>5000 mg/kg	-	
2-methylnaphthalene	402 Acute Dermal Toxicity	LD50 Dermal	Rat	>2000 mg/kg	-	-
Amines, C12-14-tert-alkyl	None available.	LD50 Oral	Rat	1630 mg/kg	-	-
	403 Acute Inhalation Toxicity	LC50 Inhalation Vapour	Rat	1.19 mg/l	4 hours	-
1-methylnaphthalene 2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	402 Acute Dermal Toxicity	LD50 Dermal	Rat	251 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	612 mg/kg	-	-
	None available.	LD50 Oral	Rat	1840 mg/kg	-	-
	403 Acute Inhalation Toxicity	LC50 Inhalation Vapour	Rat	>2.75 mg/l	4 hours	Based on data for a similar substance.
	402 Acute Dermal Toxicity	LD50 Dermal	Rabbit	>2000 mg/kg	-	Based on data for a similar substance.
Alkyl phosphonate	401 Acute Oral Toxicity	LD50 Oral	Rat	>10000 mg/kg	-	Based on data for a similar substance.
	433 Acute Inhalation Toxicity	LC50 Inhalation Vapour	Rat	>22 mg/l	1 hours	-
	434 Acute Dermal Toxicity-Fixed Dose Procedure	LD50 Dermal	Rabbit	5000 mg/kg	-	-
	420 Acute Oral Toxicity - Fixed Dose Method	LD50 Oral	Rat	>3000 mg/kg	-	-
bis(2-ethylhexyl) hydrogen phosphate	402 Acute Dermal Toxicity	LD50 Dermal	Rabbit	>2000 mg/kg	-	-
	423 Acute Oral toxicity - Acute Toxic Class Method	LD50 Oral	Rat	2500 mg/kg	-	Based on data for a similar substance.
2-ethylhexyl dihydrogen phosphate	None available.	LD50 Dermal	Rabbit	>4640 mg/kg	-	-
	423 Acute Oral toxicity - Acute Toxic Class Method	LD50 Oral	Rat	2500 mg/kg	-	Based on data for a similar substance.
(Z)-octadec-9-enylamine	402 Acute Dermal Toxicity	LD50 Dermal	Rat	>2000 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	1689 mg/kg	-	-
Alcohols, C12-16, ethoxylated	403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat	>5 mg/l	4 hours	-
	403 Acute	LC50 Inhalation	Rat	>1.6 mg/l	4 hours	-

Section 11. Toxicological information

octylamine	Inhalation Toxicity 402 Acute Dermal Toxicity	Vapour LD50 Dermal	Rabbit	>2000 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	>2000 mg/kg	-	-
	403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat	1.6 mg/l	4 hours	-
	402 Acute Dermal Toxicity	LD50 Dermal	Rabbit	200 to 2000 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	<200 mg/kg	-	-

Conclusion/Summary : Acute inhalation toxicity Not classified. On basis of test data

Irritation/Corrosion

Product/ingredient name	Test	Species	Result	Remarks
1-Propene, 2-methyl-, sulfurized	None available.	Rabbit	Eyes - Not irritant	-
Solvent naphtha (petroleum), heavy arom.	None available.	Rabbit	Skin - Not irritant	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Not irritant	Based on data for a similar substance.
Distillates (petroleum), hydrotreated heavy paraffinic	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Not irritant	Based on data for a similar substance.
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Not irritant	Based on data for a similar substance.
2-methylnaphthalene	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Not irritant	Based on data for a similar substance.
	None available.	Rabbit	Eyes - Irritant	Based on data for a similar substance.
Amines, C12-14-tert-alkyl	None available.	Rabbit	Skin - Mild irritant	Based on data for a similar substance.
	None available.	Rabbit	Eyes - Visible necrosis	-
1-methylnaphthalene	None available.	Rabbit	Skin - Visible necrosis	-
	None available.	Rabbit	Eyes - Irritant	-
2,5-bis(tert-nonyldithio) -1,3,4-thiadiazole	None available.	Rabbit	Skin - Mild irritant	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Not irritant	Based on data for a similar substance.
Alkyl phosphonate	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Mild irritant	Based on data for a similar substance.
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Irritant	-
bis(2-ethylhexyl) hydrogen phosphate	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant	-
	None available.	Rabbit	Eyes - Visible necrosis	-
2-ethylhexyl dihydrogen phosphate	None available.	Rabbit	Skin - Visible necrosis	-
	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Visible necrosis	Based on data for a similar substance.
(Z)-octadec-9-enylamine	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Visible necrosis	Based on data for a similar substance.
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Severe irritant	Based on data for a similar substance.
Alcohols, C12-16, ethoxylated	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Visible necrosis	-
	405 Acute Eye	Rabbit	Eyes - Severe irritant	-

Section 11. Toxicological information

octylamine	Irritation/Corrosion 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Not irritant	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Visible necrosis	-
	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Visible necrosis	-

Skin : Causes skin irritation. Based on test data for this or similar products.

Eyes : Causes serious eye irritation. Based on test data for this or similar products.

Respiratory : Based on available data, the classification criteria are not met.

Sensitisation

Product/ingredient name	Test	Route of exposure	Species	Result	Remarks
1-Propene, 2-methyl-, sulfurized	None available.	skin	Guinea pig	Not sensitizing	-
Solvent naphtha (petroleum), heavy arom.	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	Based on data for a similar substance.
Distillates (petroleum), hydrotreated heavy paraffinic	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	Based on data for a similar substance.
2-methylnaphthalene	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	Based on data for a similar substance.
Amines, C12-14-tert-alkyl	None available.	skin	Guinea pig	Sensitising	-
1-methylnaphthalene	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	Based on data for a similar substance.
2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	Based on data for a similar substance.
(Z)-octadec-9-enylamine	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	Based on data for a similar substance.
Alcohols, C12-16, ethoxylated	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	-

Conclusion/Summary

Skin : Not classified as a skin sensitizer. Based on test data for this or similar products.

Respiratory : Based on available data, the classification criteria are not met.

Mutagenicity

Product/ingredient name	Test	Experiment	Result	Remarks
1-Propene, 2-methyl-, sulfurized	None available.	Experiment: In vitro Subject: Bacteria	Negative	-
	None available.	Experiment: In vivo Subject: Mammalian-Animal	Negative	-
Solvent naphtha (petroleum), heavy arom.	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	Based on data for a similar substance.
	473 In vitro Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
	474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
	475 Mammalian Bone Marrow Chromosomal Aberration Test	Experiment: In vivo Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
Distillates (petroleum),	471 Bacterial Reverse	Experiment: In vitro	Negative	Based on data for a

Section 11. Toxicological information

hydrotreated heavy paraffinic	Mutation Test 473 In vitro Mammalian Chromosomal Aberration Test	Subject: Bacteria Experiment: In vitro Subject: Mammalian-Animal	Negative	similar substance. Based on data for a similar substance.
	476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
	474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
2-methylnaphthalene	None available.	Experiment: In vitro Subject: Bacteria	Negative	-
	None available.	Experiment: In vitro Subject: Mammalian-Human	Negative	-
Amines, C12-14-tert-alkyl	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
1-methylnaphthalene	None available.	Experiment: In vitro Subject: Bacteria	Positive	WOE does not support classification
	None available.	Experiment: In vitro Subject: Bacteria	Negative	-
	None available.	Experiment: In vitro Subject: Mammalian-Human	Equivocal	WOE does not support classification
	None available.	Experiment: In vivo Subject: Mammalian-Animal	Negative	-
2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	Based on data for a similar substance.
	473 In vitro Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
Alkyl phosphonate	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	473 In vitro Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
bis(2-ethylhexyl) hydrogen phosphate	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	Based on data for a similar substance.
	487 In vitro Micronucleus Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
	473 In vitro Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Human	Negative	Based on data for a similar substance.
2-ethylhexyl dihydrogen phosphate	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	Based on data for a similar substance.
	476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	Based on data for a similar substance.
	473 In vitro Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Human	Negative	Based on data for a similar substance.
(Z)-octadec-9-enylamine	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
Alcohols, C12-16, ethoxylated	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	473 In vitro Mammalian Chromosomal Aberration	Experiment: In vitro Subject: Mammalian-Animal	Negative	Based on data for a similar substance.

Section 11. Toxicological information

octylamine	Test 471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Carcinogenicity

Product/ingredient name	Test	Species	Exposure	Result	Remarks
Distillates (petroleum), hydrotreated heavy paraffinic	451 Carcinogenicity Studies	Mouse	78 weeks	Negative - Dermal - NOAEL	Based on data for a similar substance.
2-methylnaphthalene	None available.	Mouse	81 weeks; 7 days per week	Equivocal - Oral - NOAEL	-
1-methylnaphthalene	None available.	Mouse	81 weeks; 7 days per week	Equivocal - Oral - TD	-
Alkyl phosphonate	None available.	Rat	2 years	Negative - Oral - NOAEL	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Reproductive toxicity

Product/ingredient name	Test	Route of exposure	Species	Maternal toxicity	Fertility	Developmental toxin	Remarks
1-Propene, 2-methyl-, sulfurized	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Negative	Negative	Negative	Based on data for a similar substance.
Solvent naphtha (petroleum), heavy arom.	416 Two- Generation Reproduction Toxicity Study	Inhalation	Rat	Positive	Negative	Positive	Based on data for a similar substance. WOE does not support classification
Distillates (petroleum), hydrotreated heavy paraffinic	421 Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Negative	Negative	Negative	Based on data for a similar substance.
Amines, C12-14-tert- alkyl	415 One- Generation Reproduction Toxicity Study	Oral	Rat	Positive	Negative	Negative	-
2,5-bis(tert-nonyldithio) -1,3,4-thiadiazole	421 Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Negative	Negative	Negative	Based on data for a similar substance.
Alkyl phosphonate	416 Two- Generation	Oral	Rat	Positive	Negative	Equivocal	Based on data for a

Section 11. Toxicological information

bis(2-ethylhexyl) hydrogen phosphate	Reproduction Toxicity Study 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Negative	similar substance. WOE does not support classification Based on data for a similar substance.
2-ethylhexyl dihydrogen phosphate	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Negative	Based on data for a similar substance.
(Z)-octadec-9-enylamine	421 Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Negative	Based on data for a similar substance.
Alcohols, C12-16, ethoxylated	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Negative	Negative	Negative	-
octylamine	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Negative	Negative	Negative	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Teratogenicity

Product/ingredient name	Test	Species	Result	Remarks
1-Propene, 2-methyl-, sulfurized Solvent naphtha (petroleum), heavy arom.	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	Based on data for a similar substance.
	414 Prenatal Developmental Toxicity Study	Rabbit	Negative - Oral	Based on data for a similar substance.
	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	Based on data for a similar substance.
	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	Based on data for a similar substance.
Distillates (petroleum), hydrotreated heavy paraffinic Amines, C12-14-tert-alkyl	414 Prenatal Developmental Toxicity Study	Rat	Negative - Dermal	Based on data for a similar substance.
	414 Prenatal Developmental Toxicity Study	Rat	Negative - Dermal	-
2,5-bis(tert-nonyldithio) -1,3,4-thiadiazole Alkyl phosphonate	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	-
	None available.	Rat	Negative - Oral	Based on data for a

Section 11. Toxicological information

bis(2-ethylhexyl) hydrogen phosphate (Z)-octadec-9-enylamine Alcohols, C12-16, ethoxylated	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	similar substance. Based on data for a similar substance.
	None available.	Rat	Negative - Oral	-
	414 Prenatal Developmental Toxicity Study	Rabbit	Negative - Oral	-
	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	-

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
2-methylnaphthalene	Category 3	-	Respiratory tract irritation
1-methylnaphthalene	Category 3 Category 3	-	Narcotic effects Respiratory tract irritation
(Z)-octadec-9-enylamine	Category 3 Category 3	-	Narcotic effects Respiratory tract irritation
octylamine	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
2-methylnaphthalene	Category 2	-	lungs
1-methylnaphthalene	Category 2	-	lungs
(Z)-octadec-9-enylamine	Category 2	-	gastrointestinal tract, immune system, liver

Aspiration hazard

Name	Result
Solvent naphtha (petroleum), heavy arom.	ASPIRATION HAZARD - Category 1
2-methylnaphthalene	ASPIRATION HAZARD - Category 1
1-methylnaphthalene	ASPIRATION HAZARD - Category 1
(Z)-octadec-9-enylamine	ASPIRATION HAZARD - Category 1

Information on likely routes of exposure : Skin, Eyes, Ingestion, and Inhalation

Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Causes skin irritation. Defatting to the skin.
- Ingestion** : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness

Section 11. Toxicological information

- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- Ingestion** : No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

- Potential immediate effects** : Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation. Ingestion may cause gastrointestinal irritation and diarrhoea.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin.
- Potential delayed effects** : Not available.

Potential chronic health effects

Product/ingredient name	Test	Species	Dose	Exposure	Result	Remarks
1-Propene, 2-methyl-, sulfurized	None available.	Rabbit	2240 mg/kg	3 weeks; 5 days per week	Sub-acute NOAEL Dermal	-
	None available.	Rabbit	200 mg/kg	4 weeks; 5 days per week	Sub-acute NOAEL Dermal	-
	None available.	Rat	100 mg/kg	13 weeks; 5 days per week	Sub-chronic NOAEL Dermal	-
	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	1000 mg/kg	-	Sub-chronic NOAEL Oral	Based on data for a similar substance.
	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	300 mg/kg	-	Sub-chronic NOAEL Oral	Based on data for a similar substance.
Solvent naphtha (petroleum), heavy arom.	452 Chronic Toxicity Studies	Rat	900 mg/m ³	12 months	Chronic NOAEL Inhalation Vapour	Based on data for a similar substance.
	413 Subchronic Inhalation Toxicity: 90-day Study	Rat	0.38 mg/l	13 weeks	Sub-chronic NOAEL Inhalation Vapour	Based on data for a similar substance.
Distillates (petroleum), hydrotreated heavy paraffinic	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	125 mg/kg	-	Sub-chronic LOAEL Oral	Based on data for a similar substance.
	410 Repeated Dose Dermal Toxicity: 21/28-day Study	Rabbit	1000 mg/kg	-	Sub-acute NOAEL Dermal	Based on data for a similar substance.

Section 11. Toxicological information

	411 Subchronic Dermal Toxicity: 90-day Study	Rat	30 mg/kg	-	Sub-chronic NOAEL Dermal	Based on data for a similar substance.
	None available.	Rat	0.15 mg/l	13 weeks	Sub-chronic NOAEL Inhalation Dusts and mists	Based on data for a similar substance.
	None available.	Rat	0.22 mg/l	4 weeks	Sub-chronic NOAEL Inhalation Dusts and mists	Based on data for a similar substance.
Amines, C12-14-tert-alkyl	410 Repeated Dose Dermal Toxicity: 21/28-day Study	Rat	20 mg/kg	-	Sub-acute NOAEL Dermal	-
	412 Repeated Dose Inhalation Toxicity: 28-day or 14-day Study	Rat	19 mg/m ³	4 weeks	Sub-acute NOAEL Inhalation Vapour	-
2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	200 mg/kg	-	Sub-acute NOAEL Oral	Based on data for a similar substance.
	None available.	Rat	1000 mg/kg	-	Sub-acute NOAEL Oral	-
	421 Reproduction/ Developmental Toxicity Screening Test	Rat	250 mg/kg	-	Sub-acute NOAEL Oral	-
Alkyl phosphonate	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	650 mg/kg	-	Sub-chronic NOAEL Oral	-
	None available.	Rabbit	20 mg/kg	-	Sub-acute NOAEL Dermal	Based on data for a similar substance.
	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	250 mg/kg	-	Sub-acute NOAEL Oral	Based on data for a similar substance.
bis(2-ethylhexyl) hydrogen phosphate	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	125 mg/kg	-	Sub-chronic NOAEL Oral	Based on data for a similar substance.
	453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat	0.13 mg/l	12 months	Chronic NOEL Inhalation Dusts and mists	Based on data for a similar substance.
	407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	150 mg/kg	-	Sub-acute NOAEL Oral	-
	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	125 mg/kg	-	Sub-acute NOAEL Oral	Based on data for a similar substance.

Section 11. Toxicological information

2-ethylhexyl dihydrogen phosphate	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	125 mg/kg	-	Sub-acute NOAEL Oral	Based on data for a similar substance.
(Z)-octadec-9-enylamine	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	250 mg/kg	-	Sub-chronic NOAEL Oral	Based on data for a similar substance.
Alcohols, C12-16, ethoxylated	407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	3.25 mg/kg	-	Sub-acute NOAEL Oral	-
	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	1000 mg/kg	-	Sub-acute NOAEL Oral	-
	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	1000 mg/kg	-	Sub-chronic NOAEL Oral	-
octylamine	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	100 mg/kg	-	Sub-chronic NOAEL Oral	Based on data for a similar substance.

Conclusion/Summary : Not available.

General : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/ or dermatitis.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure	Remarks
1-Propene, 2-methyl-, sulfurized	Acute EL50 >100 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	No effects at saturation.
	Acute EL50 >1000 mg/l	Daphnia - Daphnia magna	48 hours	No effects at saturation.
	Acute LL50 10000 mg/l	Fish - Cyprinodon variegatus	96 hours	-
	Chronic NOEL 5 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	No effects at saturation.
Solvent naphtha (petroleum), heavy arom.	Acute EL50 >1 mg/l	Algae - Raphidocelis subcapitata	72 hours	-
	Acute EL50 1.4 mg/l	Crustaceans - Daphnia magna	48 hours	Based on data

Section 12. Ecological information

Distillates (petroleum), hydrotreated heavy paraffinic	Acute LL50 2 to 5 mg/l	Fish - Oncorhynchus mykiss	96 hours	for a similar substance.
	Chronic NOEL 1 mg/l	Algae - Raphidocelis subcapitata	72 hours	-
	Chronic NOEL 0.48 mg/l	Crustaceans - Daphnia magna	21 days	Based on data for a similar substance.
	Acute EL50 >10000 mg/l	Daphnia - Daphnia magna	48 hours	Based on data for a similar substance.
	Acute LL50 >100 mg/l	Fish - Pimephales promelas	96 hours	Based on data for a similar substance.
2-methylnaphthalene	Chronic NOEL ≥100 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	Based on data for a similar substance.
	Chronic NOEL 10 mg/l	Daphnia - Daphnia magna	21 days	Based on data for a similar substance.
	Chronic NOEL 1000 mg/l	Fish - Oncorhynchus mykiss	14 days	QSAR result.
	Acute EC50 1.9 mg/l	Algae	72 hours	-
	Acute EC50 1.39 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute LC50 1.88 mg/l	Fish - Oryzias latipes	96 hours	-
	Chronic NOEC 0.28 mg/l	Algae	72 hours	-
Amines, C12-14-tert-alkyl	Chronic NOEC 0.233 mg/l	Daphnia - Daphnia magna	21 days	-
	Acute EL50 0.44 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Acute EL50 2.5 mg/l	Daphnia - Daphnia magna	48 hours	-
1-methylnaphthalene	Acute EL50 63.5 mg/l	Micro-organism	30 minutes	-
	Acute LL50 1.3 mg/l	Fish - Oncorhynchus mykiss	96 hours	-
	Chronic NOEC 0.078 mg/l	Fish - Oncorhynchus mykiss	96 days	-
	Chronic NOEL 0.05 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Acute EC50 2.8 mg/l	Algae	72 hours	-
	Acute EL50 2.24 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute LL50 5.66 mg/l	Fish - Oryzias latipes	96 hours	-
2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	Chronic NOEC 0.45 mg/l	Algae	72 hours	-
	Chronic NOEC 0.223 mg/l	Daphnia - Daphnia magna	21 days	-
	Acute EC50 ≥8000 mg/l	Micro-organism	16 hours	Based on data for a similar substance.
	Acute EL50 >100 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
Alkyl phosphonate	Acute EL50 41 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute LL50 >1000 mg/l	Fish - Pimephales promelas	96 hours	-
	Chronic EL10 >100 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Acute EC50 14.4 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Acute EL50 >10000 mg/l	Micro-organism	3 hours	Based on data for a similar

Section 12. Ecological information

	Acute IC50 20.8 mg/l Acute LC50 63.4 mg/l Chronic EC10 5.1 mg/l Chronic NOEL 4.1 mg/l	Daphnia - Daphnia magna Fish - Danio rerio Algae - Pseudokirchneriella subcapitata Daphnia - Daphnia magna	48 hours 96 hours 72 hours 21 days	substance. - - -
bis(2-ethylhexyl) hydrogen phosphate	Acute EC50 >100 mg/l	Algae - Desmodesmus subspicatus	72 hours	Based on data for a similar substance. Based on data for a similar substance.
	Acute EC50 890 mg/l Acute LC50 60.7 mg/l Acute LC50 20 mg/l Chronic EC10 76 mg/l	Micro-organism Crustaceans - Daphnia magna Fish - Oncorhynchus mykiss Algae - Desmodesmus subspicatus	3 hours 48 hours 96 hours 72 hours	- - - Based on data for a similar substance.
2-ethylhexyl dihydrogen phosphate	Chronic NOEC 20.6 mg/l Acute EL50 49 mg/l	Fish - Oncorhynchus mykiss Algae - Pseudokirchneriella subcapitata	48 days 72 hours	- Based on data for a similar substance.
	Acute EL50 >100 mg/l	Daphnia - Daphnia magna	48 hours	Based on data for a similar substance.
	Acute EL50 420 mg/l	Micro-organism	3 hours	Based on data for a similar substance.
	Acute LL50 >100 mg/l	Fish - Oncorhynchus mykiss	96 hours	Based on data for a similar substance.
	Chronic NOEL 25 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	Based on data for a similar substance.
(Z)-octadec-9-enylamine	Acute EL50 0.04 mg/l	Algae - Selenastrum capricornutum	96 hours	-
	Acute EL50 0.011 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute EL50 222.5 mg/l	Micro-organism	3 hours	Based on data for a similar substance.
	Acute LL50 0.06 mg/l Chronic NOEL 0.01 mg/l Chronic NOEL 0.013 mg/l	Fish - Pimephales promelas Algae - Selenastrum capricornutum Daphnia - Daphnia magna	96 hours 96 hours 21 days	- - -
Alcohols, C12-16, ethoxylated	EC50 >2 mg/l	Micro-organism	5 hours	Based on data for a similar substance.
	Acute EC50 0.044 mg/l	Algae - Raphidocelis subcapitata	72 hours	Based on data for a similar substance.
	Acute EC50 0.125 mg/l	Crustaceans - Daphnia magna	48 hours	Based on data for a similar substance.
	Acute LC50 0.423 mg/l	Fish - Danio rerio	96 hours	Based on data for a similar substance.
	Chronic EC10 0.034	Algae - Raphidocelis subcapitata	72 hours	Based on data

Section 12. Ecological information

octylamine	mg/l			for a similar substance.
	Chronic EC10 0.054 mg/l	Crustaceans - Daphnia magna	21 days	Based on data for a similar substance.
	Chronic EC10 0.251 mg/l	Fish - Pimephales promelas	28 days	Based on data for a similar substance.
	Acute EC50 1.9 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute EL50 0.23 mg/l	Algae - Desmodesmus subspicatus	72 hours	-
Acute LC50 5.19 mg/l	Fish - Pimephales promelas	96 hours	-	
Chronic EL10 0.07 mg/l	Algae - Desmodesmus subspicatus	72 hours	-	

Conclusion/Summary : Toxic to aquatic life with long lasting effects.

Persistence and degradability

Product/ingredient name	Test	Result	Remarks
1-Propene, 2-methyl-, sulfurized	OECD 301B Ready Biodegradability - CO2 Evolution Test	0.3 % - Not readily - 28 days	-
Solvent naphtha (petroleum), heavy arom.	OECD 301F Ready Biodegradability - Manometric Respirometry Test	58.6 % - Inherent - 28 days	Based on data for a similar substance.
Distillates (petroleum), hydrotreated heavy paraffinic	OECD 301F Ready Biodegradability - Manometric Respirometry Test	31 % - Not readily - 28 days	Based on data for a similar substance.
Amines, C12-14-tert-alkyl	OECD 301D Ready Biodegradability - Closed Bottle Test	21.8 % - Not readily - 28 days	-
1-methylnaphthalene	-	0 to 2 % - Not readily - 28 days	-
2,5-bis(tert-nonyldithio)-1,3,4-thiadiazole	OECD 301C Ready Biodegradability - Modified MITI Test (I)	2 % - Not readily - 28 days	Based on data for a similar substance.
Alkyl phosphonate	OECD 301F Ready Biodegradability - Manometric Respirometry Test	89.8 % - Inherent - 28 days	Readily biodegradable but failing the 10-day window
bis(2-ethylhexyl) hydrogen phosphate	OECD 301F Ready Biodegradability - Manometric	75 % - Readily - 28 days	-

Section 12. Ecological information

2-ethylhexyl dihydrogen phosphate	Respirometry Test OECD 301B Ready	98 % - Readily - 28 days	Based on data for a similar substance.
(Z)-octadec-9-enylamine	Biodegradability - CO2 Evolution Test OECD 301B Ready	66 % - Readily - 28 days	-
Alcohols, C12-16, ethoxylated	Biodegradability - CO2 Evolution Test OECD 301F Ready	95 % - Readily - 28 days	Based on data for a similar substance.
octylamine	Biodegradability - Manometric Respirometry Test OECD 301A Ready	99 % - Readily - 11 days	-
	Biodegradability - DOC Die-Away Test		

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Solvent naphtha (petroleum), heavy arom.	2.8 to 6.5	99 to 5780	high
2-methylnaphthalene	3.86	74.13	low
Amines, C12-14-tert-alkyl	2.9	-	low
1-methylnaphthalene	3.87	53.7	low
Alkyl phosphonate	1.81	-	low
bis(2-ethylhexyl) hydrogen phosphate	2.67	2.7 to 6	low
octylamine	2.9	-	low

Mobility in soil

- Soil/water partition coefficient (K_{oc})** : Not available.
- Mobility** : Not available.
- Hazardous to the ozone layer** : Not applicable.
- Other adverse effects** : No known significant effects or critical hazards.

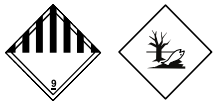
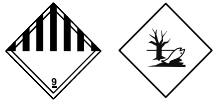
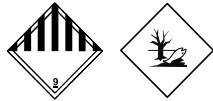

Section 13. Disposal considerations

- Disposal methods** : The generation of waste should be avoided or minimised 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

Section 13. Disposal considerations

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. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	UN	ADG	IMDG	IATA
14.1 UN number	UN3082	UN3082	UN3082	UN3082
14.2 UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (Long-chain alkyl amine)	Environmentally hazardous substance, liquid, n.o.s. (Long-chain alkyl amine)	Environmentally hazardous substance, liquid, n.o.s. (Long-chain alkyl amine) Marine pollutant	Environmentally hazardous substance, liquid, n.o.s. (Long-chain alkyl amine)
14.3 Transport hazard class (es)	9 	9 	9 	9 
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	Yes.

Additional information

Hazchem code

3Z

14.6 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.

14.7 Transport in bulk according to IMO instruments

: Not available.

Section 15. Regulatory information

China

List of Goods banned for Importing

None of the components are listed.

List of Goods banned for Exporting

None of the components are listed.

List of Toxic Chemicals Severely Restricted for Importing & Exporting by China

None of the components are listed.

Section 15. Regulatory information

Singapore

Singapore - hazardous chemicals under government control

Ingredient name	Status
None of the components are listed.	

Australia

Standard for the Uniform Scheduling of Medicines and Poisons

Not applicable.

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

Japan

Fire Service Law

Category	Substance name/Type	Danger category
Category IV	Class III petroleum	III

Industrial Safety and Health Act

Label Requirements and Chemicals Requiring Notification

Ingredient name	%
Petroleum naphtha	≥10 - ≤15
Mineral oil	≥10 - ≤15
Methylnaphthalene	≥5.0 - ≤10

Chemical Substances Control Law (CSCL)

None of the components are listed.

Poisonous and Deleterious Substances

None of the components are listed.

Pollutant Release and Transfer Registers (PRTR)

Ingredient name	%	Measured as	Status	Control number
Methylnaphthalene	≥5.0 - ≤10		Class 1	438
Alkan-1-amine (limited to those the alkane is linear chain and C8,10,12,14,16 or 18 and the mixture thereof), (Z)-octadec-9-en-1-amine, (9Z,12Z)-octadeca-9,12-dien-1-amine and the mixture thereof	≥1.0 - ≤3.0		Class 1	576

For information of a target concentration please contact your Afton representative.

Japan - Water Pollution Control Law

Ingredient name
n-Hexane Extracts (mineral oil)

Korea

Regulation according to ISHA

Section 15. Regulatory information

ISHA article 117 (Harmful substances prohibited from manufacture) : None of the components are listed.

ISHA article 118 (Harmful substances requiring permission) : None of the components are listed.

Standard of Industrial Safety and Health Annex 12 (Hazardous substances subject to control) : None of the components are listed.

Ingredient name

ISHA Enforcement Regs Annex 19 (Exposure standards established for harmful factors) : ethylene oxide

Remarks

Impurity (<0.005%)

ISHA Enforcement Regs Annex 21 (Harmful factors subject to Work Environment Measurement) : None of the components are listed.

ISHA Enforcement Regs Annex 22 (Harmful Factors Subject to Special Health Check-up) : metal working fluids: oil mist, mineral

Wastes regulation : Designated waste

Regulation according to K-REACH/CCA

	Chemical name	%	Remarks
K-REACH/CCA Toxic chemicals	: Naphthalene	<0.1	Impurity

K-REACH/CCA - Banned : None of the components are listed.

K-REACH/CCA - Restricted : None of the components are listed.

Section 15. Regulatory information

K-REACH/CCA : None of the components are listed.

Article - TRI

K-REACH/CCA : None of the components are listed.

Article 39 (Accident

Precaution

Chemicals)

Dangerous Materials Safety Management Act : **Class:** Class 4 - Flammable Liquid
Item: 5. Class 3 petroleums - Water-insoluble liquid
Threshold: 2000 L
Danger category: III
Signal word: Contact with sources of ignition prohibited

International Inventory Status

Australia (AIC) : All components are listed or exempted.

Canada (DSL/NDSL) : All components are listed or exempted.

China (IECSC) : All components are listed or exempted.

Europe (REACH) : For information on compliance with this regulation please contact your Afton representative (EHS.CustomerVolumes@AftonChemical.com).

Japan (ENCS) : All components are listed or exempted.

Republic of Korea (ECL) : All components are listed or exempted.

New Zealand (NZIoC) : All components are listed or exempted.

Philippines (PICCS) : All components are listed or exempted.

Switzerland (SWISS) : For information on compliance with this regulation please contact your Afton representative (EHS.CustomerVolumes@AftonChemical.com).

Turkey (KKDIK) : For information on compliance with this regulation please contact your Afton representative (EHS.CustomerVolumes@AftonChemical.com).

Taiwan (TCSI) : All components are listed or exempted.

United Kingdom (UK REACH) : For information on compliance with this regulation please contact your Afton representative (EHS.CustomerVolumes@AftonChemical.com).

United States Active (TSCA) : All components are active or exempted.

Section 16. Other information

History

Date of issue/Date of revision : 11/30/2023

EHS Department (Tel: +1 804 788 5800)

Key to abbreviations

: ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 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)
 UN = United Nations
 WOE = Weight of Evidence

Procedure used to derive the classification

Section 16. Other information

Classification	Justification
FLAMMABLE LIQUIDS - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2	On basis of test data Calculation method Calculation method Calculation method Calculation method

Toxicological and Ecotoxicological Test Data Summary(s) : AT_A1, CORR_A5, ECO_A16, ECO_A6, LUB_A44, SEN_A9

Toxicological and Ecotoxicological Test Data Summary(s)

Data Summary(s)

 Indicates information that has changed from previously issued version.

Notice to reader

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