

SAFETY DATA SHEET

Fuel Oil A

Section 1. Identification

GHS product identifier : Fuel Oil A
Chemical name : Hydrocarbons, C4-7, butadiene manuf. by-product
CAS number : 69103-05-5
Other means of identification : NABS Lean Oil

Product use : Fuel feedstock.

Supplier's details : TPC Group
One Allen Center, Suite 2000
Houston, TX, 77002, USA
T 713-627-7474

e-mail address of person responsible for this SDS : communications@tpcgrp.com

Emergency telephone number (with hours of operation) : 800-424-9300 (Chemtrec - U.S.)
+1-703-527-3887 (Chemtrec - International)

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 : FLAMMABLE LIQUIDS - Category 3
SKIN IRRITATION - Category 2
EYE IRRITATION - Category 2B
GERM CELL MUTAGENICITY - Category 1
CARCINOGENICITY - Category 1A
ASPIRATION HAZARD - Category 1

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : Flammable liquid and vapor.
May be fatal if swallowed and enters airways.
Causes skin and eye irritation.
May cause genetic defects.
May cause cancer.

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing and eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating or lighting equipment. Take action to prevent static discharges. Ground and bond container and receiving equipment. Keep container tightly closed. Wash hands thoroughly after handling.

Section 2. Hazards identification

Response	: IF exposed or concerned: Get medical advice or attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. 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.
Storage	: Store locked up. Store in a well-ventilated place. Keep cool.
Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements	: Avoid contact with skin and clothing. Wash thoroughly after handling.
Hazards not otherwise classified	: Prolonged or repeated contact may dry skin and cause irritation.
Hazards identified when used	: No known significant effects or critical hazards.

Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Chemical name	: Hydrocarbons, C4-7, butadiene manuf. by-product
Other means of identification	: NABS Lean Oil

Ingredient name	Synonyms	%	Identifiers
Hydrocarbons, C4-7, butadiene manuf. by-product	NABS Lean Oil	100	CAS: 69103-05-5
Contains:			
Solvent naphtha (petroleum), medium aliph.	Straight run kerosine; Solvent naphtha, petroleum, medium aliphatic; Medium aliphatic solvent naphtha, petroleum; Solvent naphtha medium aliphatic; Solvent naphtha, medium aliph.; Stoddard Solvent; Solvent naphtha (petroleum), medium aliphatic; MEDIUM ALIPHATIC SOLVENT NAPHTHA (PETROLEUM); Straight run white spirit; White spirit type 0, regular flash point; Medium aliphatic solvent naphtha (petroleum) C9-C12	50 - 100	CAS: 64742-88-7
4-vinylcyclohexene	Cyclohexene, 4-ethenyl; Vinylcyclohexene; 1-Cyclohexene 4-vinyl-; Cyclohexenylethylene; 4-Ethenyl-1-cyclohexene; 4-Vinyl-1-cyclohexene; 4-Ethenylcyclohexene; 4-Vinylcyclohex-1-ene; CYCLOHEXENE, 4-VINYL-; Vinylcyclohexene (4-); vinyl cyclohexene, 4-	50 - 100	CAS: 100-40-3
2,4,4-trimethylpentene	Pentene, 2,4,4-trimethyl-; Diisobutylene; Diisobutylene (Isomer mixture); Octene; Diisobutylene; Diisobutene	0 - 50	CAS: 25167-70-8

Section 3. Composition/information on ingredients

1,3-butadiene	buta-1,3-diene; .alpha.,.gamma.-Butadiene; Biethylene; Biviny; Erythrene; Pyrrolylene; Vinylethylene; Butadiene (1,3-Butadiene); Butadiene; Divinyl; butadiene in gaseous state, impure	<2	CAS: 106-99-0
buta-1,2-diene	1,2-Butadiene; methylallene; Butadiene	<2	CAS: 590-19-2
but-1-ene	1-Butene; Butylene; n-BUTENE; Ethylethylene; n-Butylene; 1-Butylene; alpha-butylene; Butene; butene-1	<2	CAS: 106-98-9

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.
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 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.
Skin contact	: Wash skin thoroughly with soap and water or use recognized skin cleanser. 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. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: Get medical attention immediately. Call a poison center or physician. 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. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. 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 eye irritation.
Inhalation	: Acute overexposure can cause nervous system depression.
Skin contact	: Causes skin irritation. Defatting to the skin.
Ingestion	: May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

Eye contact	: Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	: No specific data.

Section 4. First aid measures

- Skin contact** : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- Ingestion** : Adverse symptoms may include the following:
nausea or vomiting

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

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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 dry chemical, CO₂, water spray (fog) or foam. Use an extinguishing agent suitable for the surrounding fire. Water may be ineffective.
- Unsuitable extinguishing media** : Do not use water jet.

- Specific hazards arising from the chemical** : Flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

- 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.

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. Shut off all ignition sources. No flares, smoking or flames in hazard area. 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".

Section 6. Accidental release measures

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).

Methods and materials 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. 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. Use spark-proof tools and explosion-proof equipment. 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). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not swallow. Avoid breathing vapor or mist. 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. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. 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** : Do not store above the following temperature: 49°C (120.2°F). 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. Store locked up. Eliminate all ignition sources. Separate from oxidizing 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 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

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Hydrocarbons, C4-7, butadiene manuf. by-product	None.
Solvent naphtha (petroleum), medium aliph.	OSHA PEL (United States, 5/2018) [Naphtha (Coal tar)] TWA 8 hours: 100 ppm. TWA 8 hours: 400 mg/m ³ . OSHA PEL 1989 (United States, 3/1989) [Naphtha (Coal tar)] TWA 8 hours: 100 ppm. TWA 8 hours: 400 mg/m ³ .
4-vinylcyclohexene	OARS WEEL (United States, 9/2024) TWA 8 hours: 1 ppm. CAL OSHA PEL (United States, 1/2025) Absorbed through skin. TWA 8 hours: 0.4 mg/m ³ . TWA 8 hours: 0.1 ppm. ACGIH TLV (United States, 1/2025) A3. TWA 8 hours: 0.1 ppm. TWA 8 hours: 0.44 mg/m ³ .
diisobutylene	OARS WEEL (United States, 9/2024) TWA 8 hours: 75 ppm. TWA 8 hours: 344 mg/m ³ .
1,3-butadiene	NIOSH REL (United States, 10/2020) NIA. CAL OSHA PEL (United States, 1/2025) STEL 15 minutes: 11 mg/m ³ . STEL 15 minutes: 5 ppm. TWA 8 hours: 2.2 mg/m ³ . TWA 8 hours: 1 ppm. OSHA PEL (United States, 5/2018) TWA 8 hours: 1 ppm. STEL 15 minutes: 5 ppm. ACGIH TLV (United States, 1/2024) A2. TWA 8 hours: 2 ppm. TWA 8 hours: 4.4 mg/m ³ .
buta-1,2-diene	None.
but-1-ene	ACGIH TLV (United States, 1/2025) [Butenes] TWA 8 hours: 250 ppm.

Biological exposure indices

Ingredient name	Exposure indices
1,3-butadiene	ACGIH BEI (United States, 1/2024) BEI: 2.5 mg/l [Semi-quantitative: The determinant is an indicator of exposure to the chemical, but the quantitative interpretation of the measurement is ambiguous. These determinants should be used as a screening test if a quantitative test is not practical or as a confirmatory test if the quantitative test is not specific and the origin of the determinant is in question.], 1,2 dihydroxy-4-(N-acetylcysteinyl)-butane [in urine]. Sampling time: end of shift. BEI: 2.5 pmol/g hemoglobin [Semi-quantitative: The determinant is an indicator of exposure to the chemical, but the quantitative

Section 8. Exposure controls/personal protection

interpretation of the measurement is ambiguous. These determinants should be used as a screening test if a quantitative test is not practical or as a confirmatory test if the quantitative test is not specific and the origin of the determinant is in question.], mixture of N-1- and N-2-(hydroxybutenyl)valine hemoglobin (Hb) adducts [in blood]. Sampling time: not critical.

- 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, vapor 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: chemical splash goggles.
- 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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- 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.
Recommended: Ensure an MSHA/NIOSH-approved respirator or equivalent is used.

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.
Color	: Dark Brown.
Odor	: Solvent-like.
Odor threshold	: Not available.
pH	: Not available.
Melting point/freezing point	: Not available.
Boiling point or initial boiling point and boiling range	: 89.4 to 276.7°C (192.9 to 530.1°F)
Flash point	: Closed cup: <40°C (<104°F)
Evaporation rate	: Not available.
Flammability	: Not available.
Lower and upper explosion limit/flammability limit	: Not available.
Vapor pressure	: 0.36 kPa (2.71 mm Hg) [20°C (68°F)]
Relative vapor density	: 4.9 [Air = 1]
Relative density	: 0.775 to 0.85
Solubility in water	: Negligible.
Partition coefficient: n-octanol/water	: Not applicable.
Auto-ignition temperature	: 260°C (500°F)
Decomposition temperature	: Not available.
Viscosity	: Dynamic (room temperature): Not available. Kinematic (room temperature): Not available. Kinematic (40°C (104°F)): Not available. Kinematic (50°C (122°F)): 19.5 mm ² /s (19.5 cSt)
Explosive properties	: Not available.
Oxidizing 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 and polymerization will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing 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	Result and Species	Dose [Exposure]	Remarks
4-vinylcyclohexene diisobutylene	Oral - Rat - LD50	2560 mg/kg	-
	Oral - Rabbit - Male, Female - LD50 [OECD 401]	>2000 mg/kg	-
	Dermal - Rat - Male, Female - LD50 [OECD 402]	>2000 mg/kg	-
	Oral - Rat - Male - LD50	>2500 mg/kg	-
	Inhalation - Rat - Male, Female - LC50 Vapor [EPA OPPTS 870.1300]	>19171 mg/m ³ [4 hours]	test substance: CAS no. 25167-70-8 (similar material)
1,3-butadiene	Oral - Rat - LD50	5480 mg/kg	-
	Inhalation - Rat - LC50 Vapor	285 g/m ³ [4 hours]	-
	Inhalation - Rat - LC50 Gas.	128000 ppm [4 hours]	-

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

Irritation/Corrosion

Product/ingredient name	Result and Species	Exposure	Remarks
4-vinylcyclohexene	Eyes - Rabbit - Mild irritant	-	-
	Skin - Rabbit - Moderate irritant	-	-

Conclusion/Summary

Skin : Causes skin irritation.
Eyes : Causes serious eye irritation.
Respiratory : Not available.

Respiratory or skin sensitization

Product/ingredient name	Route of exposure and Species	Result	Remarks
1,3-butadiene	skin - Mammal (species unspecified)	Not sensitizing	-

Conclusion/Summary

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

Mutagenicity

Product/ingredient name	Result	Experiment	Remarks
1,3-butadiene	Positive	In vivo - Mammalian-Animal - Somatic	-
	Positive	In vitro - Bacteria - Somatic	-
	Positive	In vivo - Mammalian-Animal - Germ	-

Conclusion/Summary : May cause genetic defects.

Carcinogenicity

Conclusion/Summary : May cause cancer.

Classification

Section 11. Toxicological information

Product/ingredient name	OSHA	IARC	NTP
4-vinylcyclohexene	-	2B	-
1,3-butadiene	+	1	Known to be a human carcinogen.

Reproductive toxicity

Product/ingredient name	Result	Species and Route of exposure	Dose [Exposure]	Remarks
4-vinylcyclohexene	<u>Fertility effects</u> : Negative	Mouse - Male, Female - Oral	500 mg/kg [7 days per week] [14 weeks]	-

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

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
diisobutylene	Category 3	-	Narcotic effects

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Name	Result
Hydrocarbons, C4-7, butadiene manuf. by-product	ASPIRATION HAZARD - Category 1
Solvent naphtha (petroleum), medium aliph.	ASPIRATION HAZARD - Category 1
diisobutylene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Eye contact : Causes eye irritation.

Inhalation : Acute overexposure can cause nervous system depression.

Skin contact : Causes skin irritation. Defatting to the skin.

Ingestion : May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

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 : Adverse symptoms may include the following:
nausea or vomiting

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

Section 11. Toxicological information

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Repeated exposure may cause skin dryness or cracking.

Potential chronic health effects

Not available.

Conclusion/Summary : Not available.

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

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : May cause genetic defects.

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)
Hydrocarbons, C4-7, butadiene manuf. by-product	3034.8	N/A	N/A	N/A	N/A
4-vinylcyclohexene	2560	N/A	N/A	N/A	N/A
1,3-butadiene	5480	N/A	128000	285	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result [Exposure]	Species	Remarks
diisobutylene	Acute - LC50 - Fresh water 0.58 mg/l [96 hours] [OECD 203]	Fish - <i>Oncorhynchus mykiss</i>	-
	Acute - EC50 - Fresh water 1.2 mg/l [48 hours] [OECD 202]	Daphnia - <i>Daphnia magna</i>	-
	Chronic - NOEC - Fresh water 0.16 mg/l [21 days] [OECD 211]	Daphnia - <i>Daphnia magna</i>	-
	Acute - EC50 - Fresh water 0.73 mg/l [72 hours] [OECD 201]	Algae - <i>Raphidocelis subcapitata</i>	-
	Acute - EC50 - Fresh water 1.5 mg/l [72 hours] [OECD 201]	Algae - <i>Raphidocelis subcapitata</i>	-
	Chronic - NOEC - Fresh water 23 mg/l - Activated sludge [28 days]	Micro-organism	-

Section 12. Ecological information

[OECD 301 B]

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

Persistence and degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
4-vinylcyclohexene	3.93	165.96	Low
diisobutylene	4.55	-	High
1,3-butadiene	1.99	10	Low
buta-1,2-diene	1.99	-	Low

Mobility in soil

Soil/Water partition coefficient : Not available.

Mobility : 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. Vapor 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 spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	ADR/RID	IMDG	IATA
UN number	UN1268	UN1268	UN1268	UN1268	UN1268	UN1268
UN proper shipping name	Petroleum distillates, n.o.s.	PETROLEUM DISTILLATES, N.O.S.	DESTILADOS DE PETRÓLEO, N. E.P.	PETROLEUM DISTILLATES, N.O.S.	PETROLEUM DISTILLATES, N.O.S.	Petroleum distillates, n.o.s.
Transport hazard class(es)	3	3	3	3	3	3

Section 14. Transport information

Label		 		 	 	 
Packing group	III	III	III	III	III	III
Environmental hazards	No.	Yes.	Yes. The environmentally hazardous substance mark is not required.	Yes.	Marine Pollutant: Yes	Yes. The environmentally hazardous substance mark is not required.

Additional information

DOT Classification

- : **Reportable quantity** 666.71 lbs / 302.69 kg [98.414 gal / 372.54 L]. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
Limited quantity Yes.
Packaging instruction Exceptions: 150. Non-bulk: 203. Bulk: 242.
Quantity limitation Passenger aircraft/rail: 60 L. Cargo aircraft: 220 L.
Special provisions 144, B1, IB3, T4, TP1, TP29

TDG Classification

- : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.18-2.19 (Class 3), 2.7 (Marine pollutant mark). The marine pollutant mark is not required when transported by road or rail.
Explosive Limit and Limited Quantity Index 5
Passenger Carrying Road or Rail Index 60
Special provisions 91, 92, 150

Mexico Classification

ADR/RID

- : **Special provisions** 223
 : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Hazard identification number 30
Limited quantity 5 L
Special provisions 664
Tunnel code (D/E)

IMDG

- : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Emergency schedules F-E, S-E
Special provisions 223, 955

IATA

- : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Quantity limitation Passenger and Cargo Aircraft: 60 L. Packaging instructions: 355. Cargo Aircraft Only: 220 L. Packaging instructions: 366. Limited Quantities - Passenger Aircraft: 10 L. Packaging instructions: Y344.
Special provisions A3

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 intended.

Section 15. Regulatory information

U.S. Federal regulations

TSCA 8(a) PAIR: 4-vinylcyclohexene; buta-1,2-diene

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Air Act (CAA) 112 regulated flammable substances: 1,3-butadiene; but-1-ene

TSCA 12(b) - Chemical export notification

Not applicable.

Clean Air Act Section 112 : Listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
1,3-butadiene	<2	Yes.	-	-	10	-

SARA 304 RQ : 666.7 lbs / 302.7 kg [98.4 gal / 372.5 L]

SARA 311/312

Classification : FLAMMABLE LIQUIDS - Category 3
 SKIN IRRITATION - Category 2
 EYE IRRITATION - Category 2B
 GERM CELL MUTAGENICITY - Category 1
 CARCINOGENICITY - Category 1A
 ASPIRATION HAZARD - Category 1
 HNOC - Defatting irritant

Composition/information on ingredients

Name	%	Classification
Hydrocarbons, C4-7, butadiene manuf. by-product	100	FLAMMABLE LIQUIDS - Category 3 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2B GERM CELL MUTAGENICITY - Category 1 CARCINOGENICITY - Category 1A ASPIRATION HAZARD - Category 1
4-vinylcyclohexene	50 - 100	FLAMMABLE LIQUIDS - Category 2 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2B CARCINOGENICITY - Category 2
Solvent naphtha (petroleum), medium aliph.	50 - 100	FLAMMABLE LIQUIDS - Category 3 ASPIRATION HAZARD - Category 1
2,4,4-trimethylpentene	0 - 50	FLAMMABLE LIQUIDS - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 ASPIRATION HAZARD - Category 1

Section 15. Regulatory information

1,3-butadiene	<2	FLAMMABLE GASES - Category 1A CHEMICALLY UNSTABLE GASES - Category A GASES UNDER PRESSURE - Liquefied gas GERM CELL MUTAGENICITY - Category 1B CARCINOGENICITY - Category 1A
buta-1,2-diene	<2	FLAMMABLE GASES - Category 1A GASES UNDER PRESSURE - Compressed gas
but-1-ene	<2	FLAMMABLE GASES - Category 1A GASES UNDER PRESSURE - Compressed gas

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	1,3-butadiene	106-99-0	<2
Supplier notification	1,3-butadiene	106-99-0	<2

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: 4-VINYL CYCLOHEXENE; DIISOBUTYLENE; 1,3-BUTADIENE; 1-BUTENE
- New York** : The following components are listed: Butadiene
- New Jersey** : The following components are listed: 4-VINYLCYCLOHEXENE; DIISOBUTYLENE; 1,3-BUTADIENE; 1-BUTENE
- Pennsylvania** : The following components are listed: CYCLOHEXENE, 4-ETHENYL-; PENTENE, 2,4,4-TRIMETHYL-; 1,3-BUTADIENE; 1-BUTENE

California Prop. 65

⚠ WARNING: This product can expose you to chemicals including 4-Vinylcyclohexene and 1,3-butadiene, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
4-Vinylcyclohexene 1,3-butadiene	- Yes.	- -

EPA PFAS Compilation from Comptox

Not listed.

TSCA 8(a)7 - One-time Reporting PFAS

Not listed.

VOC

100% (wt%)

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)

Section 15. Regulatory information

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

OECD Comprehensive Global PFAS Database

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 : 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	: All components are listed or exempted.
United States	: All components are active or exempted.
Viet Nam	: All components are listed or exempted.

Section 16. Other information

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



Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 3 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2B GERM CELL MUTAGENICITY - Category 1 CARCINOGENICITY - Category 1A ASPIRATION HAZARD - Category 1	On basis of test data Calculation method Calculation method Calculation method Calculation method Expert judgment

History

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Key to abbreviations : ADR = Agreement concerning the International Carriage of Dangerous Goods by Road
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
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
RID = The Regulations concerning the International Carriage of Dangerous Goods by

Section 16. Other information

Rail

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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