

SAFETY DATA SHEET

Classified in accordance with Health Canada Hazardous Products Regulations (SOR/2015-17)

1. Identification

Product identifier: Pyrolysis Fuel Oil - Joffre**Other means of identification****Common name(s),
synonym(s):** PFO; Heavy Fuel Oils; Olefins Manufacturing Tower Bottoms**SDS number:** NOVA-0036**Recommended use and restriction on use****Recommended use:** Petrochemical feedstocks, fuels.**Restrictions on use:** All uses other than the identified.**Manufacturer/Importer/Supplier/Distributor Information****Manufacturer**

Company Name: NOVA Chemicals
Address: P.O. Box 2518, Station M
Calgary, Alberta, Canada T2P 5C6
Telephone: Product Information: 1-412-490-4063
SDS Information Email: msdsemail@novachem.com

Emergency telephone number:

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)
1-800-424-9300 (CHEMTREC) (24 hours)

2. Hazard(s) identification

Hazard Classification According to Hazardous Products Regulations**Physical Hazards**

Flammable liquids	Category 3
Physical Hazards Not Otherwise Classified (PHNOC) - Static- accumulating flammable liquid	Category 1

Health Hazards

Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2A
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Reproductive toxicity	Category 2
Specific Target Organ Toxicity - Repeated Exposure	Category 1
Aspiration Hazard	Category 1

Environmental Hazards

Acute hazards to the aquatic environment	Category 2
Chronic hazards to the aquatic environment	Category 2

Label Elements

Hazard Symbol:**Signal Word:**

Danger

Hazard Statement:

Flammable liquid and vapour.
Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment.
Sparks may ignite liquid and vapour.
May cause flash fire or explosion.
Causes skin irritation.
Causes serious eye irritation.
May cause genetic defects.
May cause cancer.
Suspected of damaging fertility or the unborn child.
Causes damage to organs through prolonged or repeated exposure.
(Blood)
(Auditory system)
May be fatal if swallowed and enters airways.
Toxic to aquatic life with long lasting effects.

Precautionary Statements:**Prevention:**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating and lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Do not breathe dust/fume/gas/mist/vapours/spray. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/ protective clothing/ eye protection/ face protection. Avoid release to the environment.

Response:

IF SWALLOWED: Immediately call a POISON CENTRE/doctor. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water [or shower]. If skin irritation occurs: Get medical advice/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/attention. IF exposed or concerned: Get medical advice/attention. In case of fire: Use dry chemical, foam, carbon dioxide (CO₂), water spray or fog to extinguish. Collect spillage.

Storage:

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

Disposal:

Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards which do not result in GHS classification:

None.

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%) [*]
Fuel Oil, Pyrolysis **	PFO	69013-21-4	100%
Naphthalene	Naphthalene	91-20-3	12 - 21%
1H-Indene	Indene, Benzocyclopentadiene	95-13-6	1 - 6%
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	Dicyclopentadiene, DCPD	77-73-6	1 - 5%
1-Pentene	Pent-1-ene	109-67-1	0 - 3%
Benzene	Benzol	71-43-2	0 - 3%
n-Undecane	Undecane	1120-21-4	0.6 - 2%
Benzene, ethenyl-	Styrene	100-42-5	0.1 - 1%
Toluene	Methylbenzene	108-88-3	0 - 0.5%
2-Octene	Octene-2	111-67-1	0 - 0.5%

^{*} All concentrations are percent by weight.

Additional Information:

** This product has been assigned a CAS # of 69013-21-4 - Fuel Oil, Pyrolysis. It is comprised of the above listed components. Polycyclic aromatic hydrocarbons (no CAS # available) are also present (12-17 wt%). Asphaltene (heptane insoluble) (no CAS # is available) is also present (0.1-1.3 wt%). This product is considered hazardous by the Hazardous Products Regulations, 2015.

4. First-aid measures

Inhalation:	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.
Ingestion:	IF SWALLOWED: Immediately call a POISON CENTRE/doctor. Do NOT induce vomiting.
Skin Contact:	IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water [or shower]. If skin irritation occurs: Get medical advice/attention.
Eye contact:	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/attention.

Most important symptoms/effects, acute and delayed

Symptoms:	Eye irritation. Skin irritation. Blood disorders. Auditory system disorders.
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Indication of immediate medical attention and special treatment needed

Treatment:	Ensure thorough eye and skin decontamination. Treat unconsciousness, nausea, hypotension, seizures and cardiac dysrhythmias in the conventional manner. Aspiration of this product during induced emesis can result in lung injury. If evacuation of stomach contents is considered necessary, use the method least likely to cause aspiration, such as gastric lavage after protecting the airway. Observe hospitalized patients for delayed chemical pneumonia, acute tubular necrosis, encephalopathy and dysrhythmias. Monitor for urinary phenol within 72 hours of acute
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exposure.

5. Fire-fighting measures

General Fire Hazards: Flammable liquid. Vapours are heavier than air and may travel to a source of ignition and flash back. Closed containers may rupture violently when heated. Burns readily when heated to high temperatures. Consider initial downwind evacuation for at least 300 metres (1000 feet). If tank is involved in fire, ISOLATE for 800 metres (1/2 mile) in all directions. Heated vapours may form explosive mixture with air. Keep containers away from source of heat or fire.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use dry chemical, foam, carbon dioxide (CO₂), water spray or fog to extinguish. Use water to cool fire-exposed containers and to protect personnel.

Unsuitable extinguishing media: Do not use straight/direct streams as this may actually spread flames.

Specific hazards arising from the chemical: Upon combustion, this product emits carbon monoxide, carbon dioxide, low molecular weight hydrocarbons, acidic gases, nitrogen oxides, oxides of sulphur.

Special protective equipment and precautions for fire-fighters

Special fire-fighting procedures: Keep upwind. Keep unauthorized personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Immediately withdraw in case of fire and container venting or heat discolouration of a container. Avoid inhaling any smoke and combustion materials. Remove and isolate contaminated clothing and shoes. Cool containers with flooding quantities of water until well after the fire is out. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Reference Emergency Response Guidebook No. 128 for additional details and instructions.

Special protective equipment for fire-fighters: Wear positive pressure self-contained breathing apparatus (SCBA).

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unauthorized personnel away. Wear appropriate personal protective equipment. Monitor surrounding area for buildup of flammable concentrations in air. Alert stand-by emergency and fire-fighting personnel.

Methods and material for containment and cleaning up: Do not touch or walk through spilled material. As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (164 feet) in all directions. In case of leakage, eliminate all ignition sources. Keep upwind. Keep out of low areas. Stop leak if safe to do so. Contain discharge by booming on water or diking on ground. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. A vapour-suppressing foam may be used to reduce vapours. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Soil remediation may be required. Remove pooled liquid material with approved, non-sparking pumps, skimmers or vacuum equipment.

Large Spills: Water spray may reduce vapour, but may not prevent ignition

in enclosed spaces. Dike far ahead of larger spills for later disposal.
Consider initial downwind evacuation for at least 300 metres (1000 feet).

7. Handling and storage

Precautions for safe handling:

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating and lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Take special precautions when cold cutting or breaking into lines, or when cleaning and disposing of empty containers. Parts and equipment should be steam cleaned prior to maintenance procedures. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid contact with skin and eyes. Keep away from incompatible materials such as oxidizing agents and acids. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using the product. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of inadequate ventilation, use respiratory protection. Avoid release to the environment.

Conditions for safe storage, including any incompatibilities:

Storage area should be clearly identified, well-illuminated and clear of obstruction. Store in a well-ventilated place. Keep cool. Store locked up. Only allow access to authorized persons. Store and handle in properly designed pressure vessels and equipment. Store and use away from heat, sparks, open flame, or any other ignition source. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Have appropriate extinguishing capability in storage area (e.g. sprinkler system, portable fire extinguishers) and flammable gas detectors. Keep absorbents for leaks and spills readily available. Prevent soil contamination. Equip storage vessel vents with a flame arrestor. Inspect vents during winter conditions for vapour ice buildup. Storage tanks should be above ground and diked to hold entire contents. Store away from incompatible materials. Store according to applicable regulations and standards for flammable materials.

Recommended maximum temperature for storage and loading is below the flashpoint.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

1,3-Butadiene, 2-methyl-: The American Industrial Hygiene Association (AIHA) has developed an 8-hour TWA Workplace Environmental Exposure Level (WEEL) for isoprene of 2 ppm; adoption of this WEEL is recommended.

Chemical Identity	type	Exposure Limit Values		Source
Naphthalene	TWA	10 ppm	52 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	STEL	15 ppm	79 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Naphthalene	TWA	10 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
Naphthalene	TWA	10 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended

Naphthalene	TWA	10 ppm		Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Naphthalene	TWA	10 ppm		US. ACGIH Threshold Limit Values, as amended
Naphthalene	REL	10 ppm	50 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Naphthalene	STEL	15 ppm	75 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Naphthalene	IDLH	250 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
1H-Indene	TWA	10 ppm	48 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
1H-Indene	TWA	5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
1H-Indene	TWA	10 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
1H-Indene	TWA	5 ppm		Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
1H-Indene	REL	10 ppm	45 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
1H-Indene	TWA	5 ppm		US. ACGIH Threshold Limit Values, as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm	27 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm	27 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	REL	5 ppm	30 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	0.5 ppm		US. ACGIH Threshold Limit Values, as amended
	STEL	1 ppm		US. ACGIH Threshold Limit Values, as amended
Benzene	STEL	2.5 ppm	8 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	0.5 ppm	1.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Benzene	STEL	2.5 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
	TWA	0.5 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
Benzene	STEL	2.5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	TWA	0.5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Benzene	TWA	1 ppm	3 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
	STEL	5 ppm	15.5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Benzene	REL	0.1 ppm		US. NIOSH: Pocket Guide to Chemical Hazards, as amended

Benzene	STEL	1 ppm		US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene	IDLH	500 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Benzene	TWA	0.02 ppm		US. ACGIH Threshold Limit Values, as amended
Benzene, ethenyl-	STEL	40 ppm	170 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	20 ppm	85 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Benzene, ethenyl-	TWA	35 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	STEL	100 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Benzene, ethenyl-	TWA	20 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
	STEL	40 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
Benzene, ethenyl-	STEL	75 ppm		Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
	TWA	50 ppm		Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Benzene, ethenyl-	REL	50 ppm	215 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethenyl-	STEL	100 ppm	425 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethenyl-	IDLH	700 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Benzene, ethenyl-	STEL	20 ppm		US. ACGIH Threshold Limit Values, as amended
	TWA	10 ppm		US. ACGIH Threshold Limit Values, as amended
Toluene	TWA	50 ppm	188 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Toluene	TWA	20 ppm		Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
Toluene	TWA	20 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Toluene	TWA	50 ppm	188 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Toluene	TWA	20 ppm		US. ACGIH Threshold Limit Values, as amended
Toluene	STEL	150 ppm	560 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Toluene	REL	100 ppm	375 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Toluene	IDLH	500 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended

Biological Limit Values

Chemical Identity	Exposure Limit Values	Source
Benzene (S-Phenylmercapturic acid: Sampling time: End of shift.)	25 µg/g (Creatinine in urine)	ACGIH BEI
Benzene (t,t-Muconic acid: Sampling time: End of shift.)	500 µg/g (Creatinine in urine)	ACGIH BEI
Benzene, ethenyl- (styrene: Sampling time: End of shift.)	20 µg/l (Urine)	ACGIH BEI

Benzene, ethenyl- (Mandelic acid plus phenylglyoxylic acid: Sampling time: End of shift.)	150 mg/g (Creatinine in urine)	ACGIH BEI
Toluene (toluene: Sampling time: Prior to last shift of work week.)	0.02 mg/l (Blood)	ACGIH BEI
Toluene (o-Cresol, with hydrolysis: Sampling time: End of shift.)	0.3 mg/g (Creatinine in urine)	ACGIH BEI
Toluene (toluene: Sampling time: End of shift.)	0.03 mg/l (Urine)	ACGIH BEI

Exposure guidelines

Chemical Identity	Notations	Source
Naphthalene	Can be absorbed through the skin.	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	Can be absorbed through the skin.	Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
	Can be absorbed through the skin.	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	Can be absorbed through the skin.	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended
Benzene	Can be absorbed through the skin.	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	Can be absorbed through the skin.	Canada. British Columbia OELs: Table of Exposure Limits for Chemical Biological Substances (Workers Compensation Board); as amended
	Can be absorbed through the skin.	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Toluene	Can be absorbed through the skin.	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	Can be absorbed through the skin.	Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety), as amended

Appropriate Engineering Controls

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

Individual protection measures, such as personal protective equipment**General information:**

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Eye/face protection:

Safety glasses. Chemical goggles are recommended if splashing is possible or to prevent eye irritation from heated vapours or mists.

Skin Protection**Hand Protection:** Chemical resistant gloves.**Skin and Body Protection:**

Wear appropriate clothing to prevent any possibility of skin contact. Wear work clothes with long sleeves and pants. If splashing or contact with liquid material is possible, consider the need for an impervious overcoat. Fire resistant (i.e., Nomex) or natural fibre clothing (i.e., cotton or wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where a flammable vapour release may occur. Wear chemical-resistant safety footwear with good traction to prevent slipping. Static Dissipative (SD) rated footwear is also recommended.

Respiratory Protection:

Appropriate NIOSH approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4, or self-contained breathing apparatus should be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators or IDLH levels.

Hygiene measures:

Use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

9. Physical and chemical properties**Appearance****Physical state:** liquid**Form:** Oily**Colour:** Dark**Odour:** Pungent, Disagreeable**Odour Threshold:** < 1 ppm (various components)**pH:** not applicable**Melting point/freezing point:** -57 - -36 °C (-71 - -33 °F)**Initial boiling point and boiling range:** 80 - 522 °C (176 - 972 °F)**Flash Point:** 28 - 80 °C (82 - 176 °F) (PMCC)**Evaporation rate:** No data available.**Flammability (solid, gas):** not applicable**Upper/lower limit on flammability or explosive limits****Flammability limit - upper (%):** 5.9 %(V) (Naphthalene)**Flammability limit - lower(%):** 0.9 %(V) (Naphthalene)**Vapour pressure:** < 1 mm HG (20 °C (68 °F)) (estimated)**Vapour density:** > 2 (estimated) (various components) (Air=1)**Density:** 920 - 1,060 kg/m³**Relative density:** 0.920 - 1.060 (15 °C (59 °F)) (Water=1)**Solubility(ies)****Solubility in water:** Insoluble in water**Solubility (other):** No data available.**Partition coefficient (n-octanol/water):** No data available.**Auto-ignition temperature:** No data available.**Decomposition temperature:** No data available.**Viscosity:** 5.0 - 9.9 mm²/s (40 °C (104 °F))**10. Stability and reactivity****Reactivity:** Reacts with oxidizing agents, can readily cause fire or explosion when in contact with open flame or excessive heat.

Chemical Stability:	Material is stable under normal conditions.
Possibility of Hazardous Reactions:	No data available.
Conditions to Avoid:	Exposure to open flame or excessive heat can cause fire or explosion. Keep away from heat, sparks and open flame.
Incompatible Materials:	Oxidizing agents.
Hazardous Decomposition Products:	Upon decomposition, this product emits carbon monoxide, carbon dioxide, low molecular weight hydrocarbons, acidic gases, nitrogen oxides, oxides of sulphur.

11. Toxicological information

Information on likely routes of exposure

Inhalation:	Known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard. Hearing loss.
Ingestion:	May be fatal if swallowed and enters airways. Minute amounts aspirated into the lungs during ingestion may cause severe lung damage. Ingestion may also cause blood disorders.
Skin Contact:	Causes skin irritation.
Eye contact:	Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	Headache, dizziness, confusion, loss of appetite and/or loss of consciousness. Hearing loss.
Ingestion:	Vomiting, nausea, abdominal pain and central nervous system effects.
Skin Contact:	Skin irritation.
Eye contact:	Eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral Product:	LD 50 (Rat): > 5,000 mg/kg
Dermal Product:	LD 50 (Rabbit): > 2,000 mg/kg
Inhalation Product:	LC 50 (Rat, 4 h): > 3.7 mg/l Dust and mist: Not classified LC 50 was not reached at the dose of 3.7 mg/l (maximum dose tested). LC 50 : Vapour: Not classified

Repeated dose toxicity Product:	No data available.
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Components:

Benzene
LOAEL (Rat, Oral): 25 mg/kg (Target Organ(s): Blood)
LOAEL (Rat, Inhalation - vapour): 0.958 mg/l (Target Organ(s): Blood)
LOAEL (Human, Inhalation - vapour): 0.0018 mg/l (Target Organ(s): Blood)

Skin Corrosion/Irritation

Product: Causes skin irritation.

Serious Eye Damage/Eye Irritation

Product: Causes serious eye irritation.

Respiratory or Skin Sensitization

Product: No data available.

Components:

4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-
Skin sensitization, Draize (Guinea Pig): Not a skin sensitizer.

Carcinogenicity

Product: May cause cancer.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Naphthalene Overall evaluation: 2B. Possibly carcinogenic to humans.
Benzene Overall evaluation: 1. Carcinogenic to humans.
Benzene, ethenyl- Overall evaluation: 2A. Probably carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Naphthalene Reasonably Anticipated to be a Human Carcinogen.
Benzene Known To Be Human Carcinogen.
Benzene, ethenyl- Reasonably Anticipated to be a Human Carcinogen.

ACGIH Carcinogen List:

Naphthalene Group A3: Confirmed animal carcinogen with unknown relevance to humans.
Benzene Group A1: Confirmed human carcinogen.
Benzene, ethenyl- Group A3: Confirmed animal carcinogen with unknown relevance to humans.

Germ Cell Mutagenicity**In vitro**

Product: May cause genetic defects.

In vivo

Product: May cause genetic defects.

Reproductive toxicity

Product: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure

Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure

Product: Blood, Auditory system - Causes damage to organs through prolonged or repeated exposure.

Aspiration Hazard

Product: May be fatal if swallowed and enters airways.

Other effects: No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: LC 50 (Fathead minnow, 96 h): 3.2 mg/l
Toxic to aquatic life.

Aquatic Invertebrates

Product: LC 50 (Water flea, 48 h): 2.16 mg/l
Toxic to aquatic life.

Toxicity to aquatic plants

Product: EC 50 (Green algae (*Selenastrum capricornutum*), 48 h): 2.96 mg/l
Toxic to aquatic life.

Chronic hazards to the aquatic environment:

Fish

Product: Toxic to aquatic life with long lasting effects.

Aquatic Invertebrates

Product: Toxic to aquatic life with long lasting effects.

Toxicity to aquatic plants

Product: Toxic to aquatic life with long lasting effects.

Persistence and Degradability

Biodegradation

Product: Exhibited a range, 7 to 57% biodegradation under standard testing procedures after 28 days.

BOD/COD Ratio

Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF)

Product: No data available.

Components:

4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro- Carp, Bioconcentration Factor (BCF): 58.9 - 384

Benzene Clupea harengus, Bioconcentration Factor (BCF): 11 Aquatic sediment
Experimental result, Supporting study

Toluene Leuciscus idus melanotus, Bioconcentration Factor (BCF): 90 Aquatic
sediment Experimental result, Key study

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Components:

Naphthalene 3.30

1H-Indene 2.92

4,7-Methano-1H-indene,
3a,4,7,7a-tetrahydro-

2.78

Benzene

2.13

Benzene, ethenyl-

2.95

Toluene

2.73

Mobility in Soil:

Will partition largely between the air, water, and soil compartments, with a negligible amount partitioning to sediment.

Other Adverse Effects:

This product will accumulate on the surface of plants, waterfowls and mammals, resulting in serious injury and possible death. Contains polycyclic aromatic hydrocarbons which are known to persist and bioaccumulate.

13. Disposal considerations**Disposal instructions:**

Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste.

Contaminated Packaging:

Check local, federal and provincial environmental regulations prior to disposal.

14. Transport information**TDG**

UN number or ID number:	UN 3295
UN Proper Shipping Name:	HYDROCARBONS, LIQUID, N.O.S.
Class	3
Packing Group	III
Label(s)	3
Subsidiary risk label	—
Special precautions for user:	Reference Emergency Response Guidebook No. 128, latest revision.

15. Regulatory information**Canada Federal Regulations****List of Toxic Substances (CEPA, Schedule 1)****Chemical Identity**

Naphthalene
Benzene
1,3-Butadiene, 2-methyl-

Export Control List (CEPA 1999, Schedule 3)

Not regulated

National Pollutant Release Inventory (NPRI)

Canada. Canadian Environmental Protection Act (CEPA). National Pollutant Release Inventory (NPRI) (Parts 1-4)

NPRI	Naphthalene
	4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-
	1-Pentene
	Benzene
	n-Undecane

Benzene, ethenyl-
Decane
Pentane, 2-methyl-

Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements

NPRI PT5

1-Pentene
Benzene
Benzene, ethenyl-
Decane
Toluene
Benzene, dimethyl-

Greenhouse Gases

Not regulated

Precursor Control Regulations**Chemical Identity**

Toluene

Canada. Substances Subject to Significant New Activity (SNAc) Reporting Requirements

Not regulated

Inventory status

Canada DSL Inventory List:

On or in compliance with the inventory

US TSCA Inventory:

On or in compliance with the inventory

16. Other information, including date of preparation or last revision**Issue Date:** 07/24/2024

Revision Information: 07/24/2024: SDS Update – OEL updates and phrase edits
07/14/2023: SDS Update – composition edits, GHS classification change,
OEL updates, section 9 edits, section 15 edits, phrase edits
12/09/2019: SDS Update

Version #: 8.1

Abbreviations and acronyms: ACGIH = American Conference of Governmental Industrial Hygienists; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CEPA = Canadian Environmental Protection Act; COD = Chemical Oxygen Demand; DSL = Domestic Substances List; EC50 = Effective Concentration 50%; EPA = Environmental Protection Agency; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; IARC = International Agency for Research on Cancer; IDLH = Immediately Dangerous to Life or Health; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; REL = Recommended Exposure Limit; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Further Information: For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity".

For additional information on storing and handling flammable liquids, refer to the National Fire Protection Association (NFPA) 30, "Flammable and

Combustible Liquids Code".

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