

SAFETY DATA SHEET

No. 6 Fuel Oil



Section 1. Identification

GHS product identifier : No. 6 Fuel Oil
Chemical name : Fuel oil, residual
Synonyms : Heavy Fuel oil; Fuel oil, no. 6; No. 6 fuel oil; Fuel oil, no. 6.; Fuel oil No. 6
Code : 17100
MSDS # : 17100

Supplier's details : CITGO Petroleum Corporation
P.O. Box 4689
Houston, TX 77210
sdsvend@citgo.com

Emergency telephone number (with hours of operation) : Technical Contact: (800) 248-4684
Medical Emergency: (832) 486-4700
CHEMTREC Emergency: (800) 424-9300
(United States Only)

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 : ACUTE TOXICITY (inhalation) - Category 4
EYE IRRITATION - Category 2B
GERM CELL MUTAGENICITY - Category 1
CARCINOGENICITY - Category 1B
TOXIC TO REPRODUCTION (Unborn child) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver, thymus) - Category 2
AQUATIC HAZARD (ACUTE) - Category 1
AQUATIC HAZARD (LONG-TERM) - Category 1

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: Harmful if inhaled.
Causes eye irritation.
May cause genetic defects.
May cause cancer.
Suspected of damaging the unborn child.
May be fatal if swallowed and enters airways.
May cause damage to organs through prolonged or repeated exposure. (liver, thymus)
Very 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. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Do not breathe vapor. Wash hands thoroughly after handling.

Section 2. Hazards identification

- Response** : Collect spillage. Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. 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 attention.
- Storage** : Store locked up.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Supplemental label elements** : Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and receiving equipment. These alone may be insufficient to remove static electricity. Do not taste or swallow. Wash thoroughly after handling.
- Hazards not otherwise classified** : Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor may cause flash fire or explosion. Causes digestive tract burns. May contain or release poisonous hydrogen sulfide gas.

Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : Fuel oil, residual
- Other means of identification** : Heavy Fuel oil; Fuel oil, no. 6; No. 6 fuel oil; Fuel oil, no. 6.; Fuel oil No. 6

CAS number/other identifiers

- CAS number** : 68553-00-4

Ingredient name	%	CAS number
Polycyclic aromatic hydrocarbons	3 - 7	130498-29-2
Naphthalene	0.5 - 1.5	91-20-3
Hydrogen sulfide	0.5 - 1.5	7783-06-4

* = Various ** = Mixture *** = Proprietary

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

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.

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 it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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 necessary, call a poison center or physician. 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 contaminated skin with soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Section 4. First aid measures

- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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** : Harmful if inhaled. Hydrogen sulfide may be released from this product. Highest concentrations are likely in the vapor spaces of storage tanks, barge compartments and process equipment. Hydrogen sulfide may be harmful or fatal if inhaled. NIOSH has determined that atmospheres containing 100 ppm or more of hydrogen sulfide (H₂S) are immediately dangerous to life and health. At concentrations above 500 ppm, H₂S causes unconsciousness and respiratory paralysis leading to coma and/or death. Inhalation of gas may cause respiratory paralysis, severe nose, throat, respiratory tract, and lung irritation, depending on the concentration and duration of exposure. Symptoms are characterized by coughing, choking, or shortness of breath.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : Corrosive to the digestive tract. Causes burns. May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Skin contact** : No specific data.
- Ingestion** : Adverse symptoms may include the following:
stomach pains
nausea or vomiting

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

- Notes to physician** : If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position. Treat intoxications as hydrogen sulfide exposures.
- Specific treatments** : Treat symptomatically and supportively.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that gas or vapor is 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 an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

Specific hazards arising from the chemical

- : This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static accumulation may be significantly increased by the presence of small quantities of water or other contaminants. In a fire or if heated, a pressure increase will occur and the container may burst. This material is very 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
sulfur 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.

Special protective equipment for fire-fighters

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

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

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

For emergency responders

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

Environmental precautions

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

Methods and materials for containment and cleaning up

Small spill

- : Stop leak if without risk. Move containers from spill area. 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. 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. 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 spilled 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). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Restrict flow velocity according to API 2003 (2008), NFPA 77 (2007), and Laurence Britton, "Avoiding Static Ignition Hazards in Chemical Operations". To reduce potential for static discharge, ensure that all equipment is properly grounded and bonded and meets appropriate electrical classification requirements. This material can release hydrogen sulfide gas. Refer to Section 8 for description of appropriate respiratory personnel protective equipment. This material may evolve hydrogen sulfide (H₂S), a highly flammable and poisonous gas. Always check for hazardous vapors and take appropriate precautions.

Advice on general occupational hygiene

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

Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. H₂S is a potentially deadly gas. Do not rely on the ability to smell H₂S. Use appropriate respiratory protection. Hydrogen Sulfide (H₂S) can accumulate during storage of this material. Monitor for H₂S during tank gauging and similar operations. 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.

Bulk Storage Conditions: Maintain all storage tanks in accordance with applicable regulations. Use necessary controls to monitor tank inventories. Inspect all storage tanks on a periodic basis. Test tanks and associated piping for tightness. Maintain the automatic leak detection devices to assure proper working condition.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Polycyclic aromatic hydrocarbons

ACGIH TLV (United States). Notes: Coal Tar Pitch Volatiles, as benzene soluble aerosol

TWA: 0.2 mg/m³ 8 hours.

OSHA PEL (United States). Notes: Coal Tar Pitch Volatiles, as benzene soluble aerosol

TWA: 0.2 mg/m³ 8 hours.

NIOSH REL (United States, 10/2016).

TWA: 0.1 mg/m³ 10 hours.

OSHA PEL (United States, 6/2016).

TWA: 0.2 mg/m³ 8 hours. Form: Benzene soluble

ACGIH TLV (United States). Absorbed through skin.

STEL: 15 ppm 15 minutes.

ACGIH TLV (United States, 3/2017).

Naphthalene

Section 8. Exposure controls/personal protection

Absorbed through skin.

TWA: 10 ppm 8 hours.

TWA: 52 mg/m³ 8 hours.

NIOSH REL (United States, 10/2016).

TWA: 10 ppm 10 hours.

TWA: 50 mg/m³ 10 hours.

STEL: 15 ppm 15 minutes.

STEL: 75 mg/m³ 15 minutes.

OSHA PEL (United States, 6/2016).

TWA: 10 ppm 8 hours.

TWA: 50 mg/m³ 8 hours.

ACGIH TLV (United States, 3/2017).

TWA: 1 ppm 8 hours.

STEL: 5 ppm 15 minutes.

OSHA PEL Z2 (United States, 2/2013).

CEIL: 20 ppm

AMP: 50 ppm 10 minutes.

NIOSH REL (United States, 10/2016).

CEIL: 10 ppm 10 minutes.

CEIL: 15 mg/m³ 10 minutes.

Hydrogen sulfide

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.

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, vapor controls, 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 glasses equipped with side shields are recommended as minimum protection in industrial settings. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. 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 inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection

- : Avoid skin contact with liquid. Chemical-resistant 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. Leather gloves are not protective for liquid contact.

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

- : Avoid skin contact with liquid. 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. Leather boots are not protective for liquid contact.

Section 8. Exposure controls/personal protection

- Respiratory protection** : Avoid inhalation of gases, vapors, mists or dusts. Use a properly fitted, air-purifying or supplied-air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommend: A full-face supplied air pressure-demand respirator with escape bottle or a pressure-demand self-contained, breathing apparatus (SCBA) is required. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

Section 9. Physical and chemical properties

Appearance

- Physical state** : Liquid.
- Color** : Brown to black.
- Odor** : Hydrocarbon.
- pH** : Not available.
- Melting point** : <30°C (<86°F)
- Boiling point** : 260 to 590°C (500 to 1094°F)
- Flash point** : Closed cup: >94°C (>201.2°F) [Estimated]
- Lower and upper explosive (flammable) limits** : Lower: 0.6%
Upper: 6%
- Vapor pressure** : Not available.
- Vapor density** : >1 [Air = 1]
- Relative density** : 0.95 to 1.03 [Estimated]
- Density lbs/gal** : Estimated 8.25 lbs/gal
- Density gm/cm³** : Not available.
- Solubility** : Very slightly soluble in the following materials: cold water.
- Solubility in water** : 0 g/l
- Flow time (ISO 2431)** : Not available.
- Conductivity** : <50 picosiemens/meter (unadditized)

Section 10. Stability and reactivity

- Reactivity** : Not expected to be Explosive, Self-Reactive, Self-Heating, or an Organic Peroxide under US GHS Definition(s).
- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : No specific data.
- Incompatible materials** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Fuel oil, residual	LD50 Oral	Rat	5300 mg/kg	-
Fuel oil, No 6	LD50 Oral	Rat	5300 mg/kg	-
Polycyclic aromatic hydrocarbons	LD50 Dermal	Rabbit	>2000 mg/kg	-
Naphthalene	LD50 Oral	Rat	>5000 mg/kg	-
Hydrogen sulfide	LD50 Oral	Rat	490 mg/kg	-
	LC50 Inhalation Gas.	Mouse	634 ppm	1 hours
	LC50 Inhalation Gas.	Rat	820 mg/m ³	3 hours
	LC50 Inhalation Gas.	Rat	700 mg/m ³	4 hours
	LC50 Inhalation Gas.	Rat	444 ppm	4 hours
	LC50 Inhalation Gas.	Rat	470 mg/m ³	6 hours

Conclusion/Summary : **Fuel oil, No 6:**
 Acute Dermal Toxicity (rabbit): 0% to 38% mortality at 5 ml/kg.
 Acute Oral LD50 (rat): 5.13 ml/kg to GT 25 ml/kg
 Eye (rabbit): Slight irritant
 Dermal (rabbit): Slight irritant
 Subacute Dermal LD50 (rabbit): 1.9 ml/kg to GT 8 ml/kg.
 Dermal Sensitization (guinea pig): Nonsensitizing.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Fuel oil, residual	Eyes - Mild irritant	Rabbit	-	24 hours 100 microliters	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
Fuel oil, No 6	Eyes - Mild irritant	Rabbit	-	24 hours 100 microliters	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
Naphthalene	Skin - Mild irritant	Rabbit	-	495 milligrams	-

Skin : No additional information.
Eyes : No additional information.
Respiratory : No additional information.

Sensitization

Not available.

Skin : No additional information.
Respiratory : No additional information.

Mutagenicity

Not available.

Conclusion/Summary : **naphthalene:** Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) *in vitro*.

Carcinogenicity

Not available.

Conclusion/Summary : **Polycyclic aromatic hydrocarbons:** Chronic or repeated exposure increases the likelihood of tumor initiation as well as the potential for metabolism of a PNA procarcinogen into a carcinogen. Increased incidence of tumors of the skin, bladder, lung and gastrointestinal tract have been described in individuals exposed to elevated concentrations of certain PNAs.

Dermal exposures are associated with precancerous lesions, erythema, dermal burns,

Section 11. Toxicological information

photosensitivity, acneiform lesions and irritation. Oral exposure to certain PNAs have been associated with precancerous growths of the mouth (leukoplakia). Also, mild nephrotoxicity, indicated by increased kidney size, congestion and renal cortical hemorrhages, plus elevated liver function tests and histopathologic abnormalities have occurred in rats following chronic ingestion.

naphthalene: Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract.

Classification

Product/ingredient name	OSHA	IARC	NTP
Fuel oil, residual	-	2B	-
Fuel oil, No 6	-	2B	-
Polycyclic aromatic hydrocarbons	+	1	-
Naphthalene	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Not available.

Conclusion/Summary : No additional information.

Teratogenicity

Not available.

Conclusion/Summary : No additional information.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Hydrogen sulfide	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Fuel oil, residual	Category 2	Not determined	liver and thymus

Aspiration hazard

Not available.

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

Potential acute health effects

Eye contact : Causes eye irritation.

Inhalation : Harmful if inhaled. Hydrogen sulfide may be released from this product. Highest concentrations are likely in the vapor spaces of storage tanks, barge compartments and process equipment. Hydrogen sulfide may be harmful or fatal if inhaled. NIOSH has determined that atmospheres containing 100 ppm or more of hydrogen sulfide (H₂S) are immediately dangerous to life and health. At concentrations above 500 ppm, H₂S causes unconsciousness and respiratory paralysis leading to coma and/or death. Inhalation of gas may cause respiratory paralysis, severe nose, throat, respiratory tract, and lung irritation, depending on the concentration and duration of exposure. Symptoms are characterized by coughing, choking, or shortness of breath.

Skin contact : No known significant effects or critical hazards.

Ingestion : Corrosive to the digestive tract. Causes burns. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact	: Adverse symptoms may include the following: irritation watering redness
Inhalation	: Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
Skin contact	: No specific data.
Ingestion	: Adverse symptoms may include the following: stomach pains nausea or vomiting

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

Short term exposure

Potential immediate effects	: Not available.
Potential delayed effects	: Not available.

Long term exposure

Potential immediate effects	: Not available.
Potential delayed effects	: Not available.

Potential chronic health effects

Not available.

General	: May cause damage to organs through prolonged or repeated exposure.
Carcinogenicity	: May cause cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	: May cause genetic defects.
Teratogenicity	: Suspected of damaging the unborn child.
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
Naphthalene	Acute EC50 1.6 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 2350 µg/l Marine water	Crustaceans - Palaemonetes pugio	48 hours
	Acute LC50 213 µg/l Fresh water	Fish - Melanotaenia fluviatilis - Larvae	96 hours
Hydrogen sulfide	Chronic NOEC 0.5 mg/l Marine water	Crustaceans - Uca pugnax - Adult	3 weeks
	Chronic NOEC 1.5 mg/l Fresh water	Fish - Oreochromis mossambicus	60 days
	Acute EC50 62 µg/l Fresh water	Crustaceans - Gammarus pseudolimnaeus	2 days
	Acute LC50 2 µg/l Fresh water	Fish - Coregonus clupeaformis - Yolk-sac fry	96 hours

Conclusion/Summary : Not available.

Persistence and degradability

Not available.

Conclusion/Summary : Not available.

Section 12. Ecological information

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Naphthalene	3.4	36.5 to 168	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

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

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Naphthalene	91-20-3	Listed	U165

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	NA1993	Not regulated.	Not regulated.
UN proper shipping name	Combustible liquid, n.o.s. (contains Petroleum Distillates)	-	-
Transport hazard class(es)	Combustible liquid.	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.

Additional information

DOT Classification : Non-bulk packages (less than or equal to 119 gal) of combustible liquids are not regulated as hazardous materials in package sizes less than the product reportable quantity.
Reportable quantity 10000 lbs / 4540 kg [1211.5 gal / 4585.9 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.

Section 14. Transport information

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: 2.43-2.45 (Class 9), 2.7 (Marine pollutant mark). Non-bulk packages of this product are not regulated as dangerous goods when transported by road or rail.
- Mexico Classification** : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
- ADR/RID** : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
- IMDG** : **Remarks** Elevated temperature liquid if transported above 94 degrees celsius.
- IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Remarks Elevated temperature liquid if transported above 94 degrees celsius.

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 Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

- U.S. Federal regulations** : **United States inventory (TSCA 8b):** All components are listed or exempted.
Clean Water Act (CWA) 307: naphthalene; Polycyclic aromatic hydrocarbons
Clean Water Act (CWA) 311: naphthalene; hydrogen sulphide
- This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Hydrogen sulfide	<1	Yes.	500	-	100	-

SARA 304 RQ : 11223.3 lbs / 5095.4 kg [1359.7 gal / 5146.9 L]

SARA 311/312

- Classification** : ACUTE TOXICITY (inhalation) - Category 4
EYE IRRITATION - Category 2B
GERM CELL MUTAGENICITY - Category 1
CARCINOGENICITY - Category 1B
TOXIC TO REPRODUCTION (Unborn child) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver, thymus) - Category 2
HNOC - Static-accumulating flammable liquid
HNOC - Corrosive to digestive tract

Composition/information on ingredients

Section 15. Regulatory information

Name	%	Classification
Fuel oil, residual	>99	ACUTE TOXICITY (inhalation) - Category 4 EYE IRRITATION - Category 2B GERM CELL MUTAGENICITY - Category 1 CARCINOGENICITY - Category 1B TOXIC TO REPRODUCTION (Unborn child) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver, thymus) - Category 2 HNOC - Static-accumulating flammable liquid HNOC - Corrosive to digestive tract
Fuel oil, No 6	>99	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2A CARCINOGENICITY - Category 1B GERM CELL MUTAGENICITY - Category 1B CARCINOGENICITY - Category 1B TOXIC TO REPRODUCTION (Unborn child) (dermal) - Category 1B
Polycyclic aromatic hydrocarbons	3 - 7	FLAMMABLE SOLIDS - Category 2 ACUTE TOXICITY (oral) - Category 4 CARCINOGENICITY - Category 2
Naphthalene	0.5 - 1.5	FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Compressed gas ACUTE TOXICITY (inhalation) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
Hydrogen sulfide	0.5 - 1.5	

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Polycyclic aromatic hydrocarbons	130498-29-2	<10
	naphthalene	91-20-3	<2
Supplier notification	Polycyclic aromatic hydrocarbons	130498-29-2	<10
	naphthalene	91-20-3	<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: NAPHTHALENE
- New York** : The following components are listed: Naphthalene
- New Jersey** : The following components are listed: NAPHTHALENE; MOTH FLAKES; POLYCYCLIC AROMATIC HYDROCARBONS
- Pennsylvania** : The following components are listed: NAPHTHALENE; Polycyclic aromatic hydrocarbons

California Prop. 65 Clear and Reasonable Warnings (2018)

⚠ WARNING: This product can expose you to chemicals including Polycyclic aromatic hydrocarbons, Naphthalene, which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Ingredient name	%	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Polycyclic aromatic hydrocarbons	<10	Yes.	No.	-	-
naphthalene	<2	Yes.	No.	Yes.	-

International regulations

Inventory list

- United States** : All components are listed or exempted.
- Australia** : All components are listed or exempted.
- Canada** : All components are listed or exempted.
- China** : All components are listed or exempted.

Section 15. Regulatory information

Europe	: All components are listed or exempted.
Japan	: Japan inventory (ENCS): Not determined. Japan inventory (ISHL): Not determined.
Malaysia	: Not determined.
New Zealand	: All components are listed or exempted.
Philippines	: Not determined.
Republic of Korea	: Not determined.
Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
Viet Nam	: Not determined.

Section 16. Other information

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



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Procedure used to derive the classification

Classification	Justification
ACUTE TOXICITY (inhalation) - Category 4	Calculation method
EYE IRRITATION - Category 2B	On basis of test data
GERM CELL MUTAGENICITY - Category 1	Calculation method
CARCINOGENICITY - Category 1B	Expert judgment
TOXIC TO REPRODUCTION (Unborn child) - Category 2	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver, thymus) - Category 2	Expert judgment
AQUATIC HAZARD (ACUTE) - Category 1	Expert judgment
AQUATIC HAZARD (LONG-TERM) - Category 1	Expert judgment

History

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Date of previous issue	: No previous validation
Version	: 1

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

Section 16. Other information

References : Not available.

✔ Indicates information that has changed from previously issued version.

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