



MATERIAL SAFETY DATA SHEET

Diesel Fuels

VALERO MARKETING & SUPPLY COMPANY
and Affiliates
P.O. Box 696000
San Antonio, TX 78269-6000

Emergency Phone Numbers

24 Hour Emergency: 866-565-5220
Chemtrec Emergency: 800-424-9300

General Assistance

General Assistance: 210-345-4593

BRAND NAMES: Valero, Diamond Shamrock, Shamrock, Ultramar, Beacon, Total

Section 1. Chemical Product and Company Identification

Common / Trade name : Diesel Fuels
Synonym : Diesel Fuels All Grades, Diesel Fuel No.2, Fuel Oil No.2, High Sulfur Diesel Fuel, Low Sulfur Diesel Fuel, Ultra Low Sulfur Diesel Fuel, CARB (California Air Resource Board) Diesel Fuel, Off-Road Diesel Fuel, Dyed Diesel Fuel, X Grade Diesel Fuel, X-1 Diesel Fuel

SYNONYMS/COMMON NAMES: This Material Safety Data Sheet applies to the listed products and synonym descriptions for Hazard Communication purposes only. Technical specifications vary greatly depending on the product and are not reflected in this document. Consult specification sheets for technical information. This product contains ingredients that are considered to be hazardous as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Material uses : This product is intended for use as a refinery feedstock, fuel, or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.

MSDS # : 102

CAS # : 68476-34-6

Section 2. Hazards Identification

Danger! Diesel Exhaust has been Reported to be an Occupational hazard due to NIOSH-reported potential carcinogenic properties.

Danger! Product May Contain or Release Hydrogen Sulfide. H2S is a highly toxic, highly flammable gas which can be fatal if inhaled at certain concentrations.

May cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard, can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. Avoid prolonged or repeated skin contact. Combustible Liquid. Vapors may explode.

Physical state : Liquid. (May be dyed red.)

Emergency overview : Danger!

CAUSES EYE BURNS.
HARMFUL IF SWALLOWED.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, LIVER, PERIPHERAL NERVOUS SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.
COMBUSTIBLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FIRE.

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Do not ingest. Do not get in eyes or on skin or clothing. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.

- Routes of entry** : Dermal contact. Eye contact. Inhalation. Ingestion.
- Potential acute health effects**
- Eyes** : Corrosive to eyes. May cause severe irritation, redness, tearing, blurred vision and conjunctivitis.
- Skin** : Prolonged or repeated contact may cause moderate irritation, defatting (cracking), redness, itching, inflammation, dermatitis and possible secondary infection. High pressure skin injections are **SERIOUS MEDICAL EMERGENCIES**. Injury may not appear serious at first. Within a few hours, tissues will become swollen, discolored and extremely painful.
- Inhalation** : Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm. Repeated or prolonged exposure may cause behavioral changes. NIOSH Current Intelligence Bulletin 50 reports a potential occupational carcinogenic hazard exists due to human exposure to diesel exhaust.
- Ingestion** : Toxic if swallowed. May cause burns to mouth, throat and stomach. This product may be harmful or fatal if swallowed. This product may cause nausea, vomiting, diarrhea and restlessness. **DO NOT INDUCE VOMITING**. Aspiration into the lungs can cause severe chemical pneumonitis or pulmonary edema/hemorrhage, which can be fatal. May cause gastrointestinal disturbances. Symptoms may include irritation, depression, vomiting and diarrhea. May cause harmful central nervous system effects, similar to those listed under "inhalation".
- Medical conditions aggravated by over-exposure** : Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray or mist may produce respiratory tract irritation, leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
- Over-exposure signs/symptoms** : Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest or sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm.

See toxicological information (section 11)

Section 3. Composition, information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>Concentration (%)</u>
Diesel fuel	68476-34-6	85 - 95
Naphthalene	91-20-3	1 - 3
n-Nonane	111-84-2	1 - 3
Hexane (Other Isomers)	mixture	1 - 3
n-Heptane	142-82-5	1 - 2
n-Hexane	110-54-3	1 - 2
Octane (All Isomers)	111-65-9	1 - 2
Biodiesel - Fatty Acid Methyl Esters	67762-38-3	0-10

Section 4. First Aid Measures

- Eye contact** : Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Seek medical advice if pain or redness continues.

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- Skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention. Wash exposed area thoroughly with soap and water. Remove contaminated clothing promptly and launder before reuse. Contaminated leather goods should be discarded. If irritation persists or symptoms described in the MSDS develop, seek medical attention. High pressure skin injections are **SERIOUS MEDICAL EMERGENCIES**. Get immediate medical attention.
- Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
- Ingestion** : This product may be harmful or fatal if swallowed. This product may cause nausea, vomiting, diarrhea and restlessness. **DO NOT INDUCE VOMITING**. Aspiration into the lungs can cause severe chemical pneumonitis or pulmonary edema/hemorrhage, which can be fatal. May cause gastrointestinal disturbances. Symptoms may include irritation, depression, vomiting and diarrhea. May cause harmful central nervous system effects, similar to those listed under "inhalation".
- Notes to physician** : In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Irregular heart beat may occur, use of adrenalin is not advisable. Individuals intoxicated by the product should be hospitalized immediately, with acute and continuing attention to neurological and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be monitored for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be monitored for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.
- 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.

Section 5. Fire Fighting Measures

- Flammability of the product** : Combustible.
- Auto-ignition temperature** : 257.2°C (495°F)
- Flash point** : Closed cup: 51.67 to 87.78°C (125 to 190°F).
- Flammable limits** : Lower: 0.4% Upper: 8%
- Products of combustion** : These products are carbon oxides (CO, CO₂), nitrogen and sulfur oxides (NO_x, SO_x), particulate matter, VOC's
- Fire hazards in the presence of various substances** : Flammable in the presence of open flames, sparks and static discharge.
- Explosion hazards in the presence of various substances** : Explosive in the presence of open flames, sparks and static discharge.
- Fire-fighting media and instructions**
- Extinguishing media**
- Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Collect contaminated fire-fighting water separately. It must not enter the sewage system. Dike area of fire to prevent runoff. Decontaminate emergency personnel and equipment with soap and water.
- Combustible liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.
- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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Special protective equipment for fire-fighters

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Special remarks on fire hazards

: When heated above its flash point, this material will release flammable vapors which, if exposed to a source of ignition, can burn in the open or be explosive in confined spaces. Mists or sprays may be flammable at temperatures below the normal flash point. Dry chemical, halon carbon dioxide are the preferred extinguishing media. Foam and water fog are effective but can cause frothing. Big fires, such as tank fires, should be fought with caution. If the burning liquid is 200F or hotter, the use of water, water spray, or foam can cause frothing and even sudden boilover of the tank, endangering the lives of personnel such as firefighters. If possible, pump the contents from the tank and keep adjoining structures cool with water. Water can be used to cool fire-exposed containers, structures and to protect personnel. If a leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers.

Section 6. Accidental Release Measures

Personal precautions

: Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Do not touch or walk through spilled material. Tanks, vessels or other confined spaces which have contained product should be freed of vapors before entering. The container should be checked to ensure a safe atmosphere before entry. Empty containers may contain toxic, flammable/combustible or explosive residues or vapors. Do not cut, grind, drill, weld or reuse empty containers that contained this product. Do not transfer this product to another container unless the container receiving the product is labeled with proper DOT shipping name, hazard class and other information that describes the product and its hazards.

Environmental precautions

: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Extremely flammable. Review Fire Fighting Measures section before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 800-424- 8802. For highway or railway spills, contact Chemtrec at 800-424-9300.

Methods for cleaning up

Small spill

: For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill

: If emergency personnel are unavailable, contain spilled material. For large spills, dike spilled material or otherwise contain it to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

Section 7. Handling and Storage

- Handling** : Do not ingest. Do not get in eyes, on skin or on clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling. Use only in well ventilated locations. Keep away from heat, spark and flames. In case of fire, use water spray, foam, dry chemical or carbon dioxide as described in the Fire Fighting Measures section of the MSDS. Do not pressurize, cut, weld, braze, solder, drill on or near this container. "Empty" container contains residue (liquid and/or vapor) and may explode in heat of a fire. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities. Keep out of reach of children. Failure to use caution may cause serious injury or illness. Never siphon by mouth. For use as a motor fuel only. Do not use as a cleaning solvent or for other non-motor fuel uses. Wash thoroughly after handling. To prevent ingestion and exposure - Do not siphon by mouth to transfer product between containers. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities.
- Storage** : Store in tightly closed containers in cool, dry, isolated and well ventilated area away from heat, sources of ignition and incompatible materials. Use non-sparking tools and explosion proof equipment. Ground lines, containers, and other equipment used during product transfer to reduce the possibility of a static induced spark. Do not "switch load" because of possible accumulation of a static charge resulting in a source of ignition. Use good personal hygiene practices.

Section 8. Exposure controls, personal protection

- Engineering measures** : 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. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

- Eyes** : 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 or dusts.
- Skin** : 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. Flame Retardant Clothing is recommended.
- Respiratory** : Use a properly fitted, air-purifying or air-fed 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.
- Hands** : 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.
- Personal protective equipment (Pictograms)** : Consult your supervisor or S.O.P. for special handling direction.



- Personal protection in case of a large spill** : Splash goggles. Full suit. Vapor respirator. Boots. Gloves. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

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- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- 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.
- 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.

Component**Exposure limits**

Diesel fuel	ACGIH TLV (United States, 1/2004). Skin Notes: 2002 Adoption. TWA: 100 mg/m ³ 8 hour(s). Form: Total hydrocarbons
Naphthalene	NIOSH REL (United States, 6/2001). STEL: 15 ppm 15 minute(s). Form: All forms TWA: 10 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 10 ppm 8 hour(s). Form: All forms ACGIH TLV (United States, 5/2004). Notes: 1996 Adoption Refers to Appendix A -- Carcinogens. STEL: 15 ppm 15 minute(s). Form: All forms TWA: 10 ppm 8 hour(s). Form: All forms
n-Nonane	NIOSH REL (United States, 6/2001). TWA: 200 ppm 10 hour(s). Form: All forms ACGIH TLV (United States, 9/2004). TWA: 200 ppm 8 hour(s). Form: All forms
Hexane (Other Isomers)	ACGIH TLV (United States, 9/2004). STEL: 1000 ppm 15 minute(s). Form: All forms TWA: 500 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). CEIL: 510 ppm 15 minute(s). Form: All forms
n-Heptane	ACGIH TLV (United States, 9/2004). STEL: 500 ppm 15 minute(s). Form: All forms TWA: 400 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). TWA: 350 mg/m ³ 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 500 ppm 8 hour(s). Form: All forms
n-Hexane	OSHA PEL (United States, 6/1993). TWA: 500 ppm 8 hour(s). Form: All forms ACGIH TLV (United States, 9/2004). Skin TWA: 50 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). TWA: 50 ppm 10 hour(s). Form: All forms
Octane (All Isomers)	NIOSH REL (United States, 6/2001). CEIL: 385 ppm 15 minute(s). Form: All forms TWA: 75 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 500 ppm 8 hour(s). Form: All forms ACGIH TLV (United States, 3/2004). Notes: 1999 Adoption. TWA: 300 ppm 8 hour(s). Form: All forms

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state	: Liquid. (May be dyed red.)
Color	: Clear. Straw.
Odor	: Kerosene (Strong.)
Boiling point	: 162.78 to 371.11°C (325 to 700°F)
Melting/freezing point	: May start to solidify at the following temperature: -51.15°C (-60.1°F) This is based on data for the following ingredient: n-Nonane. Weighted average: -92.6°C (-134.7°F)
Specific gravity	: 0.84 to 0.93 (Water = 1) (@ 60 °F)
Vapor pressure	: <0.7 kPa (<5.2 mm Hg) (at 20°C)
Vapor density	: 3 (Air = 1)

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Evaporation rate : 0.02

Section 10. Stability and reactivity data

- Stability** : The product is stable.
- Hazardous 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.
- Materials to avoid** : 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.
- Conditions of reactivity** : Flammable in the presence of open flames, sparks and static discharge.
Explosive in the presence of open flames, sparks and static discharge.

Section 11. Toxicological InformationToxicity data

DIESEL EXHAUST FUMES have been reported to be a potential occupational carcinogen in humans by NIOSH Current Intelligence Bulletin 50.

HEPTANE can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. Heptane vapor is a narcotic. Concentrations of 10,000 to 15,000 ppm produced narcosis in mice within 30 to 60 minutes, while 15,000 to 20,000 ppm caused convulsions and death. At 48,000 ppm, respiratory arrest was produced in mice in 3 to 4 minutes from the start of exposure. Human subjects exposed to 1,000 ppm for 6 minutes, or to 2,000 ppm for 4 minutes, reported slight vertigo. At 5,000 ppm for 4 minutes, there was marked vertigo, inability to walk a straight line, hilarity, and incoordination, but no complaints of eye and upper respiratory tract or mucous membrane irritation. A 15-minute exposure at 5,000 ppm produced in some subjects a state of stupor lasting for 30 minutes after exposure. These subjects also reported loss of appetite, slight nausea, and a taste resembling gasoline for several hours after exposure. Although chronic nervous system effects have not been attributed to heptane, polyneuritis has been reported following prolonged exposure to a petroleum fraction with boiling range between 70C and 100C, and this fraction would normally contain various isomers of heptane as major ingredients.

n-HEXANE can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. Hexane vapor is a narcotic and a mild upper respiratory irritant. Polyneuropathy (peripheral nerve damage) has been reported to occur in workers exposed to hexane vapors, characterized by progressive weakness and numbness in the extremities, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the duration of exposure and severity of nerve damage. Concentrations of 30,000 ppm produced narcosis in mice within 30 to 60 minutes, convulsions and death occurred at 35,000 to 40,000 ppm, and at 64,000 ppm respiratory arrest was produced in 2.5 to 4.5 minutes from the start of exposure. Concentrations up to 8000 ppm produced no anesthesia. In human subjects, 2000 ppm for 10 minutes produced no effects, but 5000 ppm resulted in dizziness and a sensation of giddiness. Other investigators reported slight nausea, headache and irritation of the eyes and throat at 1400 to 1500 ppm. In industrial practice, mild narcotic symptoms such as dizziness have been observed when concentrations exceeded 1000 ppm, but not below 500 ppm.

NONANE causes a four hour LC50 in rats at concentrations of 3200 ppm, or at about the same level as VM&P Naphtha. This level is markedly lower than the lethal concentrations reported in earlier mice studies involving octane (13,500 ppm) and heptane (16,000 ppm), supporting the lower limit for nonane.

OCTANE can affect the body if it is inhaled, comes in contact with the skin or eyes or is swallowed. Octane vapor is a mild narcotic and mucous membrane irritant. Concentrations of 6600 to 13,700 ppm produced narcosis in mice in 30 to 90 minutes, the fatal concentration for animals is near 13,500 ppm. No chronic systemic effects have been reported in humans.

NAPHTHALENE can affect the body if it is inhaled, comes into contact with the eyes or the skin or if it is swallowed. Naphthalene vapor causes hemolysis and eye irritation, and may cause cataracts. Severe intoxication from ingestion of the solid results in characteristic manifestations of marked intravascular hemolysis and its consequences, including potentially fatal hyperkalemia. Initial symptoms include eye irritation, headache, confusion, excitement, malaise, profuse sweating, nausea, vomiting, abdominal pain, and irritation of the bladder. There may be progression to jaundice, hematuria, hemoglobinuria, renal tubular blockage, and acute renal shutdown. Hematologic features include red cell fragmentation, icterus, severe anemia with nucleated red cells, leukocytosis, and dramatic decreases in hemoglobin, hematocrit and red cell count; sometimes there is formation of Heinz bodies and methemoglobin. Individuals with a deficiency of glucose-6-phosphate dehydrogenase in erythrocytes may be more susceptible to hemolysis by naphthalene. Cataracts and ocular irritation have been produced experimentally in animals and have been described in humans. Of 21 workers exposed to high concentrations of fume or vapor for 5 years, 8 had peripheral lens opacities; in other studies, no abnormalities of the eyes have been detected in workers exposed to naphthalene for several years. The vapor causes eye irritation at 15 ppm. Eye contact with the solid may result in conjunctivitis, superficial injury to the cornea, chorioretinitis, scotoma, and diminished visual acuity. Naphthalene on the skin may cause hypersensitivity dermatitis, chronic dermatitis is rare.

HEXANE ISOMERS are three times as toxic to mice as is pentane. Narcosis was produced in mice within 30-60 minutes at concentrations of 30,000 ppm. In man, concentrations for 10 minutes at 2000 ppm produced no effects, but 5000 ppm caused dizziness and a sense of giddiness. Concentrations of 1400-1500 ppm produced slight nausea, headache, eye, and throat irritation.

Acute toxicity

Product/ingredient name	Result	Species	Dose
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Diesel fuel	TDL _o Oral	Rat	1.25 mL/kg
Naphthalene	LD50 Dermal	Rabbit	>20 g/kg
	LD50 Dermal	Rat	>2500 mg/kg
	LD50 Oral	Rat	>490 mg/kg
	LD50 Unreported	Rat	1250 mg/kg
	TDL _o Intraperitoneal	Rat	100 mg/kg
n-Hexane	LD50 Oral	Rat	25 g/kg
	LDLo Intraperitoneal	Rat	9100 mg/kg
	TDL _o Oral	Rat	20000 mg/kg

Carcinogenicity**Classification**

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Diesel fuel	A3	3	-	-	-	-
Naphthalene	A4	2B	-	-	Possible	-

Chronic effects on humans : **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animals.) by ACGIH, 3 (Possible for humans.) by European Union [Diesel fuel]. Classified 3 (Not classifiable for humans.) by IARC [Diesel fuel]. Classified 2B (Possible for humans.) by IARC, 3 (Possible for humans.) by European Union [Naphthalene]. Classified 2 (Reasonably anticipated to be human carcinogens.) by NTP [Naphthalene]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Naphthalene].

Contains material which may cause damage to the following organs: blood, kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Other toxic effects on humans : Very hazardous by the following route of exposure: of eye contact (corrosive). Hazardous by the following route of exposure: of skin contact (irritant), of ingestion, of inhalation (lung irritant).

Specific effects

Carcinogenic effects : Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure.

Target organs : Contains material which causes damage to the following organs: blood, kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Section 12. Ecological Information**Ecotoxicity data**

Product/ingredient name	Result	Species	Exposure
Naphthalene	Acute EC50 1.96 mg/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 1600 to 3400 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 2550 to 3400 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 2194 to 2459 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute EC50 6470 to 9140 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute EC50 5960 to 9190 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
	Acute LC50 32.9802 ppm Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute LC50 31.0265 ppm Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute LC50 19.7675 ppm Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 17.6998 ppm Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 2.6 to 2.89 ppm Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	Acute LC50 2.1 ppm Fresh water	Fish - Coho salmon, silver salmon - Oncorhynchus kisutch	96 hours
	Acute LC50 1600 ug/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 17.4 mg/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 1370 to 1680 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha	96 hours
	Acute LC50 1240 to 1620 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha	96 hours
	Acute LC50 1200 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha	96 hours
	Acute LC50 2920 to 3890 ug/L Fresh water	Daphnia - Water flea - Daphnia pulex	48 hours
	Acute LC50 9.93 mg/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
	Acute LC50 12500 to 20500 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours
Acute LC50 2350 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours	
Acute LC50 4.9 mg/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours	
Acute LC50 9820 to 13100 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp.	48 hours	
Acute LC50 2.25 mg/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 hours	

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	Acute LC50 25.4 mg/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 2160 to 2560 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 4000 ug/L Fresh water	Crustaceans - Shrimp - Macrobrachium kistnensis	48 hours
	Acute LC50 2000 to 4000 ug/L Fresh water	Crustaceans - Shrimp - Macrobrachium kistnensis	48 hours
n-Heptane	Acute LC50 4000 to 6000 ug/L Fresh water	Crustaceans - Shrimp - Macrobrachium kistnensis	48 hours
	Acute LC50 4924000 ug/L Fresh water	Fish - Western mosquitofish - Gambusia affinis	96 hours
	Acute LC50 375000 ug/L Fresh water	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
n-Hexane	Acute LC50 113000 ug/L Fresh water	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
	Acute LC50 2500 to 2980 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours

Biodegradability**Biodegradability**

Products of degradation : Decomposition products may include the following materials: carbon oxides (CO, CO₂) and water.



Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. 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.

Consult your local or regional authorities.

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1202	Diesel fuel	3 Combus tible liquid.	III		Not available.
TDG Classification	UN1202	Diesel fuel Mixture	3	III		Not available.

Section 15. Regulatory Information**United States**

HCS Classification : Combustible liquid
Toxic material
Corrosive material
Carcinogen
Target organ effects

U.S. Federal regulations : TSCA 4(a) final test rules: Hexane (Other Isomers); n-Hexane
TSCA 8(a) PAIR: Naphthalene; n-Heptane; n-Nonane
TSCA 8(b) inventory: All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Hexane (Other Isomers); Naphthalene; n-Heptane; n-Hexane; n-Nonane; Octane (All Isomers)
SARA 311/312 MSDS distribution - hazard identification: Hexane (Other Isomers): Fire hazard, Immediate (acute) health hazard; Naphthalene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Heptane: Fire hazard; n-Hexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Nonane: Fire hazard, Immediate (acute) health hazard; Octane (All Isomers): Fire hazard

Clean Water Act (CWA) 307: Naphthalene; Toluene; Benzene

Continued on next page

Clean Water Act (CWA) 311: Naphthalene; Toluene; Benzene

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: Naphthalene	91-20-3	1 - 3
	: n-Hexane	110-54-3	1 - 2
Supplier notification	: Naphthalene	91-20-3	1 - 3
	: n-Hexane	110-54-3	1 - 2

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

State regulations

: Connecticut Carcinogen Reporting: Benzene
 Connecticut Hazardous Material Survey: Naphthalene; n-Hexane; Toluene; Benzene
 Illinois Toxic Substances Disclosure to Employee Act: Naphthalene; n-Hexane; Toluene; Benzene
 Rhode Island Hazardous Substances: Naphthalene; n-Hexane; Toluene; Benzene
 Pennsylvania RTK Hazardous Substances: Hexane (Other Isomers): (generic environmental hazard); Naphthalene: (environmental hazard, generic environmental hazard); n-Heptane: (generic environmental hazard); n-Hexane: (generic environmental hazard); n-Nonane: (generic environmental hazard); Octane (All Isomers): (generic environmental hazard); Toluene: (environmental hazard, generic environmental hazard); Benzene: (special hazard, environmental hazard, generic environmental hazard)
 Florida: Naphthalene; n-Hexane; Toluene; Benzene
 Michigan Critical Material: Toluene; Benzene
 Massachusetts Substances: Hexane (Other Isomers); Naphthalene; n-Heptane; n-Hexane; n-Nonane; Octane (All Isomers); Toluene; Benzene
 New Jersey: Naphthalene; n-Heptane; n-Hexane; n-Nonane; Diesel fuel; Octane (All Isomers); Toluene; Benzene

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Naphthalene	Yes.	No.	Yes.	No.
Toluene	No.	Yes.	No.	7000 µg/day (ingestion) 13000 µg/day (inhalation)
Benzene	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day (inhalation)	24 µg/day (ingestion) 49 µg/day (inhalation)

Canada

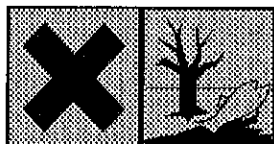
WHMIS (Canada)

: Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
 Class D-1B: Material causing immediate and serious toxic effects (Toxic).
 Class D-2A: Material causing other toxic effects (Very toxic).
 Class D-2B: Material causing other toxic effects (Toxic).
 Class E: Corrosive liquid.

CEPA DSL & NDSL: All materials are either listed or exempt

EU regulations

Hazard symbol or symbols



Diesel Fuels

Page: 11/12

- Risk phrases** : R40- Limited evidence of a carcinogenic effect.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Safety phrases** : S2- Keep out of the reach of children.
S29- Do not empty into drains.
S36/37- Wear suitable protective clothing and gloves.
S46- If swallowed, seek medical advice immediately and show this container or label.
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

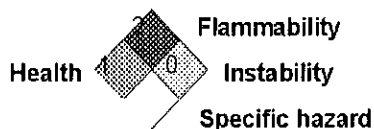
Section 16. Other Information

- Label requirements** : CAUSES EYE BURNS.
HARMFUL IF SWALLOWED.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, LIVER, PERIPHERAL NERVOUS SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.
COMBUSTIBLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FIRE.

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

Health Hazard	1
Fire Hazard	2
Physical Hazard	0
Personal protection	

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



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Definitions of Material Safety Data Sheet Terminology**GOVERNMENT AGENCIES AND PRIVATE ASSOCIATIONS**

- ACGIH** - American Conference of Governmental Industrial Hygienists, (private association)
DOT - United States Department of Transportation
EPA - United States Environmental Protection Agency
IARC - International Agency for Research on Cancer, (private association)
NFPA - National Fire Protection Association, (private association)
MSHA - Mine Safety and Health Administration, U.S. Department of Labor
NIOSH - National Institute of Occupational Safety and Health, U.S. Department of Health and Human Services
NTP - National Toxicology Program, (private association)

Continued on next page

OSHA - Occupational Safety and Health Administration, U.S. Department of Labor

WHMIS- Workplace Hazardous Material Information System

CSA- Canadian Standards Association

HAZARD AND EXPOSURE INFORMATION

Acute Hazard - An adverse health effect which occurs rapidly as a result of short term exposure.

CAS # - American Chemical Society's Chemical Abstract service registry number which identifies the product and/or ingredients.

Ceiling - The concentration that should not be exceeded during any part of the working exposure

Chronic Hazard - An adverse health effect which generally occurs as a result of long term exposure or short term exposure with delayed health effects and is of long duration

Fire Hazard - A material that poses a physical hazard by being flammable, combustible, pyrophoric or an oxidizer as defined by 29 CFR 1910.1200

Hazard Class - DOT hazard classification

Hazardous Ingredients - Names of ingredients which have been identified as health hazards

IDLH- Immediately Dangerous to Life and Health, the airborne concentration below which a person can escape without respiratory protection and exposure up to 30 minutes, and not suffer debilitating or irreversible health effects. Established by NIOSH.

mg/m3 - Milligrams of contaminant per cubic meter of air, a mass to volume ratio

N/A - Not available or no relevant information found

NA - Not applicable

PEL - OSHA permissible exposure limit; an action level of one half this value may be applicable

ppm - Part per million (one volume of vapor or gas in one million volumes of air)

Pressure Hazard - A material that poses a physical hazard due to the potential of a sudden release of pressure such as explosive or a compressed gas as defined by 29 CFR 1910.1200

Reactive Hazard - A material that poses a physical hazard due to the potential to become unstable reactive, water reactive or that is an organic peroxide as defined by 29 CFR 1910.1200.

STEL - The ACGIH Short-Term Exposure Limit, a 15-minute Time-Weighted Average exposure which should not be exceeded at any time during a workday, even if the 8-hour TWA is less than the TLV.

TLV - ACGIH Threshold Limit Value, represented herein as an 8-hour TWA concentration.

8-hour TWA - The time weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

LD50 - Single dose of a substance that, when administered by a defined route in an animal assay, is expected to cause the death of 50% of the defined animal population.

LC50 - The concentration of a substance in air that, when administered by means of inhalation over a specified length of time in an animal assay, is expected to cause the death of 50% of a defined animal population.