SAFETY DATA SHEET.

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

Jet A-1

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SECTION 1. IDENTIFICATION

Product name : Jet A-1
Product code : 002D7230

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Chemical LP/Deer Park**
PO Box 4453
HOUSTON TX 77210-4453
USA

SDS Request : (+1) 877-276-7285
Customer Service :

Emergency telephone number
Spill Information : +1-877-504-9351
Health Information : +1-877-242-7400

Recommended use of the chemical and restrictions on use

Recommended use : Fuel for aviation turbine engines fitted to aircraft.

Restrictions on use :
This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.
This product is not to be used as a solvent or cleaning agent; for lighting or brightening fires; as a skin cleanser., Not to be used as a fuel for automotive vehicles., Not to be used to prevent waxing in diesel fuel.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids : Category 3

Aspiration hazard : Category 1

Skin irritation : Category 2

Specific target organ toxicity : Category 3 (Narcotic effects)

- single exposure (Inhalation)

Long-term (chronic) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements :

PHYSICAL HAZARDS:
H226 Flammable liquid and vapour.
HEALTH HAZARDS:
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
ENVIRONMENTAL HAZARDS:
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P210Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233Keep container tightly closed.
P241Use explosion-proof electrical/ ventilating/ lighting equipment.
P242Use non-sparking tools.
P243Take action to prevent static discharges.
P261Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264Wash skin thoroughly after handling.
P271Use only outdoors or in a well-ventilated area.
P273Avoid release to the environment.
P280Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P352IF ON SKIN: Wash with plenty of water and soap.
P304 + P340IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312Call a POISON CENTER/doctor if you feel unwell.
P332 + P313If skin irritation occurs: Get medical advice/ attention.
P362 + P364Take off contaminated clothing and wash it before reuse.

P370 + P378In case of fire: Use appropriate media to extinguish.
P391Collect spillage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P235 Keep cool.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification
Slightly irritating to respiratory system.
Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space.
Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range.
May ignite on surfaces at temperatures above auto-ignition temperature.
This material is a static accumulator.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

The classification of this material is based on OSHA HCS 2024 criteria.
Hydrogen sulphide (H2S) and other hazardous vapours may evolve and accumulate in the headspace of storage tanks, transport vessels and other enclosed containers

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture
Chemical nature : Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C9 to C16 range.
May also contain several additives at <0.1% v/v each.

Components

Chemical name	Synonym	CAS-No.	Concentration (% w/w)
Distillates (petroleum), hydrotreated light	Distillates (petroleum), hydrotreated light	64742-47-8	>= 0 - <= 100
Kerosine (petroleum)	kerosine (petroleum)	8008-20-6	>= 0 - <= 100
kerosine (petroleum), hydrodesulfurized	Kerosine (petroleum), hydrodesulfurized	64742-81-0	>= 0 - <= 100

Alkanes, C8-18-branched and linear	Alkanes, C8-18-branched and linear	2252265-89-5	>= 0 - <= 50
Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear	C8-C16 branched and linear hydrocarbons (full range) – Kerosine	848301-66-6	>= 0 - <= 50
Renewable hydrocarbons (kerosene type fraction)	Alkanes, C8-16-branched and linear	1012042-03-3	>= 0 - <= 50

Hydrogen sulphide may be present both in the liquid and the vapour. Composition is complex and varies with the source of the crude oil and the contributing process plants at that time.
Total aromatic hydrocarbons present are typically in the range of 10-20%v/v.

Further information

Contains:

Chemical name	Identification number	Concentration (% w/w)
Cumene	98-82-8	>= 0 - <= 0.2
Ethylbenzene	100-41-4	>= 0 - <= 2
Toluene	108-88-3	>= 0 - <= 0.4
Naphthalene	91-20-3	>= 0 - <= 0.9
Trimethylbenzene (all isomers)	25551-13-7	>= 0 - <= 1
Xylene, mixed isomers	1330-20-7	>= 0 - <= 2

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.
Vapourisation of H2S that has been trapped in clothing can be dangerous to rescuers. Maintain respiratory protection to avoid contamination from the victim to rescuer. Mechanical ventilation should be used to resuscitate if at all possible.

If inhaled : Casualties suffering ill effects as a result of exposure to hydrogen sulphide should be removed to fresh air.
Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardiopulmonary Resuscitation (CPR) as required and transport to the nearest medical facility.
Call emergency number for your location / facility.
Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or

		Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.
In case of skin contact	:	Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop. Obtain medical attention even in the absence of apparent wounds.
In case of eye contact	:	Flush eye with copious quantities of water. Remove contact lenses, if present and easy to do. Continue rinsing. If persistent irritation occurs, obtain medical attention.
If swallowed	:	Call emergency number for your location / facility. If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.
Most important symptoms and effects, both acute and delayed	:	Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, lightheadedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing. Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. Eye irritation signs and symptoms may include a burning sen-

sation, redness, swelling, and/or blurred vision.

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

Notes to physician : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!
Call a doctor or poison control center for guidance.
Treat symptomatically.
Potential for chemical pneumonitis.
Do not induce vomiting.
High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function.
Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.
Hydrogen sulphide (H2S) - CNS asphyxiant. May cause rhinitis, bronchitis and occasionally pulmonary oedema after severe exposure. CONSIDER: Oxygen therapy. Consult a Poison Control Center for guidance.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire.
Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Specific hazards during fire-fighting : Hydrogen sulphide (H2S) and toxic sulphur oxides may be given off when this material is heated. Do not depend on sense of smell for warning.

Hazardous combustion products may include:
A complex mixture of airborne solid and liquid particulates and gases (smoke).
Oxides of sulphur.
Unidentified organic and inorganic compounds.
Carbon monoxide may be evolved if incomplete combustion occurs.
Will float and can be reignited on surface water.
Flammable vapours may be present even at temperatures below the flash point.
The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).
Further information	:	Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately. Prevent fire extinguishing water from contaminating surface water or the ground water system. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	May ignite on surfaces at temperatures above auto-ignition temperature. Do not breathe fumes, vapour. Do not operate electrical equipment. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Evacuate all personnel. Attempt to disperse vapour or to direct its flow to a safe location for example using fog sprays. Use appropriate containment to prevent uncontrolled release. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Environmental precautions	:	Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Take measures to minimise the effects on groundwater. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways. Do not allow contact with soil, surface or ground water. Avoid contact with skin, eyes and clothing. Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly. Take precautionary measures against static discharges. Observe all relevant local and international regulations.
Methods and materials for containment and cleaning up	:	Take precautionary measures against static discharges. For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or

safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely
Avoid contact with skin, eyes and clothing.
Evacuate the area of all non-essential personnel.
Ventilate contaminated area thoroughly.
Take precautionary measures against static discharges.

Observe all relevant local and international regulations.

Additional advice : For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.
Local authorities should be advised if significant spillages cannot be contained.
Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Section 15) to the National Response Center at (800) 424-8802.
Under Section 311 of the Clean Water Act (CWA) this material is considered an oil. As such, spills into surface waters must be reported to the National Response Center at (800) 424-8802.
This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse. Prevent spillages. Never siphon by mouth.
Advice on safe handling	:	Ensure that all local regulations regarding handling and storage facilities are followed. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Avoid inhaling vapour and/or mists. Avoid prolonged or repeated contact with skin. When using do not eat or drink. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Earth all equipment. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulphide require that air monitoring alarms be used if concentrations are expected to reach harmful levels such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 10 ppm, the area should be evacuated unless respiratory protection is in use.
Avoidance of contact	:	Strong oxidising agents.
Product Transfer	:	Avoid splash filling Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Keep containers closed when not in use. Conditions, such as filling empty Filter Water Separator vessels, that lead to the formation of hydrocarbon mists are also particularly hazardous.

Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations.

Further information on storage stability : Drum and small container storage:
Drums should be stacked to a maximum of 3 high.
Use properly labeled and closable containers.
Take suitable precautions when opening sealed containers, as pressure can build up during storage.
Tank storage:
Tanks must be specifically designed for use with this product.
Bulk storage tanks should be diked (bunded).
Locate tanks away from heat and other sources of ignition.
The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
Electrostatic charges will be generated during pumping.
Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.
Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Packaging material : Suitable material: For containers, or container linings use carbon steel and low alloy steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. For container linings the following may also be used: Unplastisized polyvinyl chloride (U-PVC), Fluoropolymers (PTFE), Polyvinylidenefluoride (PVDF), Polyetheretherketone (PEEK), Polyamide (PA-11). For seals and gaskets use: Fluoroelastomer (FKM), Viton A, and Viton B, Nitrile butadiene (NBR), Buna-N. For coating (paint) materials use: High build, amine adduct-cured epoxy.
Unsuitable material: For containers or container linings, examples of materials to avoid are: Polyethylene (PE, HDPE), Polypropylene (PP), Polymethyl methacrylate (PMMA), Acrylonnitrile butadiene styrene (ABS). For seals and gaskets, examples of materials to avoid are: Natural rubber (NR), Ethylene Propylene (EPDM, Polychloroprene (CR) - Neoprene, Butyl (IIR), Chlorosulphonated polyethylene (CSM), e.g. Hypalon.

Specific end use(s)

Specific use(s) : Not applicable.

See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Distillates (petroleum), hydrotreated light	64742-47-8	TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
		TWA (Mist)	5 mg/m3	NIOSH REL
		ST (Mist)	10 mg/m3	NIOSH REL
		TWA (Mist)	5 mg/m3	OSHA Z-1
		TWA (Inhalable particulate matter)	5 mg/m3	ACGIH
Cumene	98-82-8	TWA	50 ppm 245 mg/m3	NIOSH REL
		TWA	50 ppm 245 mg/m3	OSHA Z-1

		TWA	5 ppm	ACGIH
Ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	NIOSH REL
		ST	125 ppm 545 mg/m3	NIOSH REL
		TWA	100 ppm 435 mg/m3	OSHA Z-1
Toluene	108-88-3	TWA	20 ppm	ACGIH
		TWA	200 ppm	OSHA Z-2
		CEIL	300 ppm	OSHA Z-2
		Peak	500 ppm (10 minutes)	OSHA Z-2
Naphthalene	91-20-3	TWA	10 ppm 50 mg/m3	NIOSH REL
		ST	15 ppm 75 mg/m3	NIOSH REL
		TWA	10 ppm 50 mg/m3	OSHA Z-1
		TWA	10 ppm	ACGIH
Trimethylbenzene (all isomers)	25551-13-7	TWA	10 ppm	ACGIH
		TWA	25 ppm 125 mg/m3	OSHA P0
kerosine (petroleum), hydrodesulfurized	64742-81-0	TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
		TWA	200 mg/m3	ACGIH
Xylene, mixed isomers	1330-20-7	TWA	100 ppm 435 mg/m3	OSHA Z-1
		TWA	20 ppm	ACGIH
		STEL	150 ppm 655 mg/m3	OSHA P0
		TWA	100 ppm 435 mg/m3	OSHA P0

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Ethylbenzene	100-41-4	Sum of mandelic acid and phenyl glyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	0.15 g/g creatinine	ACGIH BEI
Toluene	108-88-3	Toluene	In blood	Prior to last shift	0.02 mg/l	ACGIH BEI

				of work-week		
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI
		o-Cresol	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/g creatinine	ACGIH BEI
Xylene, mixed isomers	1330-20-7	Methylhip-puric acids	Urine	End of shift (As soon as possible after exposure ceases)	0.3 g/g cre-atinine	ACGIH BEI

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

Use sealed systems as far as possible.
Firewater monitors and deluge systems are recommended.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Eye washes and showers for emergency use.

General Information

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Do not ingest. If swallowed, then seek immediate medical assistance.

Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Select a filter suitable for the combination of organic gases and vapours and particles [Type A/Type P boiling point >65°C (149°F)].
In areas where hydrogen sulphide vapours may accumulate, a positive-pressure air-supplied respirator is advised.

Hand protection

Remarks : Where hand contact with the product may occur the use of

gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. When prolonged or frequent repeated contact occurs. Nitrile rubber. For incidental contact/splash protection Neoprene, PVC gloves may be suitable. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye protection : Wear goggles for use against liquids and gas.
If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.

Skin and body protection : Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.
Wear antistatic and flame-retardant clothing, if a local risk assessment deems it so.

Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Hygiene measures : In the interests of air safety, aviation fuels are subject to strict quality requirements and product integrity is of paramount importance. For one source of information on international standards for the quality assurance of aviation fuels, see www.jigonline.com.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	Colourless to light coloured
Odour	:	No data available
Odour Threshold	:	Data not available
Freezing point	:	-47 °C
Pour point		Method: ASTM D5950 Not applicable
Boiling point/boiling range	:	150 - 300 °C Method: Unspecified
Flammability (solid, gas)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	6 %(V)
Lower explosion limit / Lower flammability limit	:	1 %(V)
Flash point	:	38 - 60 °C Method: Unspecified
Decomposition temperature	:	Data not available
pH	:	Not applicable
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	Method: Unspecified Not applicable
		1 - 2.5 mm2/s (38.0 °C) Method: Unspecified
		Method: Unspecified Not applicable

Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	log Pow: 2 - 10
Vapour pressure	:	< 1 - 3.7 kPa (38 °C) Method: Unspecified 1.6 - 7 kPa (50.0 °C) Method: Unspecified
Relative density	:	Data not available
Density	:	775 - 840 kg/m3 (15.0 °C) Method: ASTM D4052
Relative vapour density	:	Data not available
Particle characteristics		
Particle size	:	Data not available

9.2 Other information

Explosives	:	Classification Code: Not classified.
Oxidizing properties	:	Data not available
Evaporation rate	:	Data not available
Conductivity	:	Electrical conductivity: 50 - 600 pS/m., The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid

Reactivity	:	Oxidises on contact with air.
Chemical stability	:	No hazardous reaction is expected when handled and stored according to provisions
Possibility of hazardous reactions	:	No hazardous reaction is expected when handled and stored according to provisions
Conditions to avoid	:	Avoid heat, sparks, open flames and other ignition sources. In certain circumstances product can ignite due to static electricity.
Incompatible materials	:	Strong oxidising agents.
Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation. Hydrogen sulphide.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product data, a knowledge of the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure

Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD 50 (Rat): > 5,000 mg/kg Remarks: Low toxicity
Acute inhalation toxicity	:	LC 50 (Rat): > 20 mg/l Exposure time: 4 h Remarks: Low toxicity by inhalation.
Acute dermal toxicity	:	LD 50 (Rabbit): > 2000 - <=5000 mg/kg Remarks: May be harmful in contact with skin.
Acute toxicity (other routes of administration)	:	Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system.

Components:

Distillates (petroleum), hydrotreated light:

Acute oral toxicity : LD50 (Rat): > 5000 mg/kg
Remarks: Low toxicity

Acute inhalation toxicity : LC50 (Rat): 5 mg/l
Exposure time: 4 h
Remarks: Low toxicity

Acute dermal toxicity : LD50 (Rabbit): > 5000 mg/kg
Remarks: Low toxicity

Kerosine (petroleum):

Acute oral toxicity : LD 50 (Rat): > 5,000 mg/kg
Remarks: Low toxicity

Acute inhalation toxicity : LC 50 (Rat): > 5 mg/l
Exposure time: 4 h
Remarks: Low toxicity

Acute dermal toxicity : LD 50 (Rabbit): > 2,000 mg/kg
Remarks: Low toxicity

kerosine (petroleum), hydrodesulfurized:

Acute oral toxicity : LD 50 (Rat): > 5,000 mg/kg
Remarks: Low toxicity

Acute inhalation toxicity : LC 50 (Rat): > 5 mg/l
Exposure time: 4 h
Remarks: Low toxicity

Acute dermal toxicity : LD 50 (Rabbit): > 2,000 mg/kg
Remarks: Low toxicity

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Acute oral toxicity : LD 50 (rat): > 5,000 mg/kg
Remarks: Low toxicity
Based on available data, the classification criteria are not met.

Acute inhalation toxicity : (Rat): > 5 mg/l
Exposure time: 4 h
Remarks: Low toxicity
Based on available data, the classification criteria are not met.

Acute dermal toxicity : (Rat): Remarks: LD50 >2000 mg/kg

Low toxicity
Based on available data, the classification criteria are not met.

Renewable hydrocarbons (kerosene type fraction):

Acute oral toxicity : LD 50 (rat): > 5,000 mg/kg
Remarks: Low toxicity
Based on available data, the classification criteria are not met.

Acute inhalation toxicity : (Rat): > 5 mg/l
Exposure time: 4 h
Remarks: Low toxicity
Based on available data, the classification criteria are not met.

Acute dermal toxicity : (Rat): Remarks: LD50 >2000 mg/kg
Low toxicity
Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks : Causes skin irritation.

Remarks : Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.

Components:

Distillates (petroleum), hydrotreated light:

Remarks : Irritating to skin.

Kerosine (petroleum):

Remarks : Irritating to skin.

kerosine (petroleum), hydrodesulfurized:

Remarks : Irritating to skin.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Remarks : Slightly irritating to skin.
Based on available data, the classification criteria are not met.

Renewable hydrocarbons (kerosene type fraction):

Remarks : Slightly irritating to skin.
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Product:

Remarks : Not irritating to eye.

Remarks : Irritating to eyes. (Hydrogen Sulfide)

Components:

Distillates (petroleum), hydrotreated light:

Remarks : Not irritating to eye.

Kerosine (petroleum):

Remarks : Slightly irritating to the eye.
Based on available data, the classification criteria are not met.

kerosine (petroleum), hydrodesulfurized:

Remarks : Slightly irritating to the eye.
Based on available data, the classification criteria are not met.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Remarks : Slightly irritating to the eye.
Based on available data, the classification criteria are not met.

Renewable hydrocarbons (kerosene type fraction):

Remarks : Slightly irritating to the eye.
Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Components:

Distillates (petroleum), hydrotreated light:

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Kerosine (petroleum):

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

kerosine (petroleum), hydrodesulfurized:

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Renewable hydrocarbons (kerosene type fraction):

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Genotoxicity in vivo : Remarks: Non mutagenic

Germ cell mutagenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Components:

Distillates (petroleum), hydrotreated light:

Genotoxicity in vivo : Remarks: Not mutagenic.

Germ cell mutagenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Kerosine (petroleum):

Genotoxicity in vivo : Remarks: Non mutagenic
Based on available data, the classification criteria are not met.

kerosine (petroleum), hydrodesulfurized:

Genotoxicity in vivo : Remarks: Non mutagenic
Based on available data, the classification criteria are not met.

Carcinogenicity

Product:

Remarks : Limited evidence of carcinogenic effect
Tumours produced in animals are not considered relevant to humans.

Carcinogenicity - Assess- : This product does not meet the criteria for classification in

ment categories 1A/1B.

Components:

Distillates (petroleum), hydrotreated light:

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Kerosine (petroleum):

Remarks : Not classified as a carcinogen.

Remarks : Repeated skin contact has resulted in irritation and skin cancer in animals.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Remarks : Not a carcinogen.
Based on available data, the classification criteria are not met.

Renewable hydrocarbons (kerosene type fraction):

Remarks : Not a carcinogen.
Based on available data, the classification criteria are not met.

IARC	Group 2B: Possibly carcinogenic to humans	
	Cumene	98-82-8
	Group 2B: Possibly carcinogenic to humans	
	Ethylbenzene	100-41-4
	Group 2B: Possibly carcinogenic to humans	
	Naphthalene	91-20-3
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Reasonably anticipated to be a human carcinogen	
	Cumene	98-82-8
	Reasonably anticipated to be a human carcinogen	
	Naphthalene	91-20-3

Reproductive toxicity

Product:

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Components:

Distillates (petroleum), hydrotreated light:

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Reproductive toxicity

Remarks : Not a developmental toxicant.
Based on available data, the classification criteria are not met.
Does not impair fertility.

STOT - single exposure

Product:

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

Remarks : Inhalation of vapours or mists cause irritation to the respiratory system. (Hydrogen Sulfide)

Components:

Distillates (petroleum), hydrotreated light:

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness.

Kerosine (petroleum):

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness.

kerosine (petroleum), hydrodesulfurized:

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

Renewable hydrocarbons (kerosene type fraction):

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

STOT - repeated exposure

Product:

Remarks : Low systemic toxicity on repeated exposure.

Components:

Distillates (petroleum), hydrotreated light:

Remarks : Kidney: caused kidney effects in male rats which are not considered relevant to humans

Kerosine (petroleum):

Remarks : Kidney: caused kidney effects in male rats which are not considered relevant to humans

kerosine (petroleum), hydrodesulfurized:

Remarks : Kidney: caused kidney effects in male rats which are not considered relevant to humans

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

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

Renewable hydrocarbons (kerosene type fraction):

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

Aspiration toxicity

Product:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Components:

Distillates (petroleum), hydrotreated light:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Kerosine (petroleum):

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

kerosine (petroleum), hydrodesulfurized:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Renewable hydrocarbons (kerosene type fraction):

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Further information

Product:

Remarks	:	Classifications by other authorities under varying regulatory frameworks may exist.
Remarks	:	H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.

Components:

Distillates (petroleum), hydrotreated light:

Remarks	:	Classifications by other authorities under varying regulatory frameworks may exist.

Kerosine (petroleum):

Remarks	:	Classifications by other authorities under varying regulatory frameworks may exist.

kerosine (petroleum), hydrodesulfurized:

Remarks	:	Classifications by other authorities under varying regulatory frameworks may exist.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Remarks : Classifications by other authorities under varying regulatory frameworks may exist.

Renewable hydrocarbons (kerosene type fraction):

Remarks : Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Fuels are typically made from blending several refinery streams. Ecotoxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives.
Information given is based on a knowledge of the components and the ecotoxicology of similar products.Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Ecotoxicity

Product:

Toxicity to fish : Remarks: Toxic
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to daphnia and other aquatic invertebrates : Remarks: Toxic
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to algae/aquatic plants : Remarks: Toxic
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to fish (Chronic toxicity) : Remarks: NOEC/NOEL/EL10 > 0.01 - <=0.1 mg/l

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: NOEC/NOEL/EL10 > 0.1 - <=1.0 mg/l

Toxicity to microorganisms : Remarks: Practically non toxic:
LL/EL/IL50 > 100 mg/l

Components:

Distillates (petroleum), hydrotreated light:

Toxicity to fish : Remarks: Practically non toxic:

LL/EL/IL50 > 100 mg/l

Toxicity to daphnia and other aquatic invertebrates	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: Data not available
Toxicity to microorganisms	:	Remarks: Data not available

Kerosine (petroleum):

Toxicity to fish	:	Remarks: Toxic LL/EL/IL50 > 1 <= 10 mg/l
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: Toxic LL/EL/IL50 > 1 <= 10 mg/l
Toxicity to algae/aquatic plants	:	Remarks: Toxic LL/EL/IL50 > 1 <= 10 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 0.01 - <=0.1 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 0.1 - <=1.0 mg/l
Toxicity to microorganisms	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l

kerosine (petroleum), hydrodesulfurized:

Toxicity to fish	:	Remarks: Toxic LL/EL/IL50 > 1 <= 10 mg/l
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: Toxic LL/EL/IL50 > 1 <= 10 mg/l
Toxicity to algae/aquatic plants	:	Remarks: Toxic LL/EL/IL50 > 1 <= 10 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 0.01 - <=0.1 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 0.1 - <=1.0 mg/l

Toxicity to microorganisms	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Toxicity to fish	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.
Toxicity to algae/aquatic plants	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.
Toxicity to fish (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 100 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 10 - <=100 mg/l
Toxicity to microorganisms	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.

Renewable hydrocarbons (kerosene type fraction):

Toxicity to fish	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.
Toxicity to algae/aquatic plants	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.
Toxicity to fish (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 100 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: NOEC/NOEL/EL10 > 1.0 - <= 10 mg/l
Toxicity to microorganisms	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.

Persistence and degradability

Product:

Biodegradability : Remarks: Major constituents are inherently biodegradable, but contains components that may persist in the environment.
The volatile constituents will oxidize rapidly by photochemical reactions in air.
Based on available data, the classification criteria are not met.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Components:

Distillates (petroleum), hydrotreated light:

Biodegradability : Remarks: Readily biodegradable.
Oxidises rapidly by photo-chemical reactions in air.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Kerosine (petroleum):

Biodegradability : Remarks: Major constituents are inherently biodegradable, but contains components that may persist in the environment.
The volatile constituents will oxidize rapidly by photochemical reactions in air.
Based on available data, the classification criteria are not met.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

kerosine (petroleum), hydrodesulfurized:

Biodegradability : Remarks: Major constituents are inherently biodegradable, but contains components that may persist in the environment.
The volatile constituents will oxidize rapidly by photochemical reactions in air.
Based on available data, the classification criteria are not met.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Biodegradability : Remarks: Product is not persistent.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Renewable hydrocarbons (kerosene type fraction):

Biodegradability : Remarks: Product is not persistent.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Remarks: Log Pow = 2 - 10

Components:

Distillates (petroleum), hydrotreated light:

Bioaccumulation : Remarks: Has the potential to bioaccumulate.

Kerosine (petroleum):

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Remarks: Log Pow = 2 - 10

kerosine (petroleum), hydrodesulfurized:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Remarks: Log Pow = 2 - 10

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Renewable hydrocarbons (kerosene type fraction):

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Mobility in soil

Product:

Mobility : Remarks: Evaporates within a day from water or soil surfaces.
Large volumes may penetrate soil and could contaminate groundwater.
Contains volatile components.
Floats on water.

Components:

Distillates (petroleum), hydrotreated light:

Mobility : Remarks: Floats on water.
If it enters soil, it will adsorb to soil particles and will not be mobile.

Kerosine (petroleum):

Mobility : Remarks: Evaporates within a day from water or soil surfaces.
Large volumes may penetrate soil and could contaminate groundwater.
Contains volatile components.
Floats on water.

kerosine (petroleum), hydrodesulfurized:

Mobility : Remarks: Evaporates within a day from water or soil surfaces.
Large volumes may penetrate soil and could contaminate groundwater.
Contains volatile components.
Floats on water.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Mobility : Remarks: Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day.
Large volumes may penetrate soil and could contaminate groundwater.
Floats on water.

Renewable hydrocarbons (kerosene type fraction):

Mobility : Remarks: Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day.
Large volumes may penetrate soil and could contaminate groundwater.
Floats on water.

Other adverse effects

Product:

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

Components:

Kerosine (petroleum):

Results of PBT and vPvB assessment : This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

kerosine (petroleum), hydrodesulfurized:

Results of PBT and vPvB assessment : This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

Kerosene (Fischer Tropsch), Full range, C8-C16 branched and linear:

Additional ecological infor- : Films formed on water may affect oxygen transfer and dam-

mation age organisms.

Renewable hydrocarbons (kerosene type fraction):

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Do not dispose into the environment, in drains or in water courses.
Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging : Send to drum recoverer or metal reclaimer.
Drain container thoroughly.
After draining, vent in a safe place away from sparks and fire.
Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums.
Do not pollute the soil, water or environment with the waste container.
Comply with any local recovery or waste disposal regulations.

Local legislation

Remarks : Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14. TRANSPORT INFORMATION

National Regulations

49 CFR

UN/ID/NA number	:	UN 1863
Proper shipping name	:	FUEL, AVIATION, TURBINE ENGINE
Class	:	3
Packing group	:	III
Labels	:	3
Marine pollutant	:	no.

International Regulations

IATA-DGR

UN/ID No.	:	UN 1863
Proper shipping name	:	FUEL, AVIATION, TURBINE ENGINE
Class	:	3
Packing group	:	III
Labels	:	3

IMDG-Code

UN number	:	UN 1863
Proper shipping name	:	FUEL, AVIATION, TURBINE ENGINE
Class	:	3
Packing group	:	III
Labels	:	3
Marine pollutant	:	yes

Maritime transport in bulk according to IMO instruments

MARPOL Annex 1 rules apply for bulk shipments by sea.

Special precautions for user

Remarks	:	Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)

Xylene, mixed isomers	1330-20-7	100	5000

CERCLA Reportable Quantity

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Aspiration hazard
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Ethylbenzene	100-41-4	>= 1 - < 5 %
Xylene, mixed isomers	1330-20-7	>= 1 - < 5 %
Naphthalene	91-20-3	>= 0.1 - < 1 %
Cumene	98-82-8	>= 0.1 - < 1 %

Clean Water Act
The following Hazardous Chemicals are listed under the U.S. Clean Water Act, Section 311, Table 117.3:

Xylene, mixed isomers	1330-20-7	2 %
Naphthalene	91-20-3	0.9 %
Toluene	108-88-3	0.4 %
Ethylbenzene	100-41-4	2 %

US State Regulations

Massachusetts Right To Know

Distillates (petroleum), hydrotreated light	64742-47-8
Kerosine (petroleum)	Not Assigned

Pennsylvania Right To Know

Distillates (petroleum), light hydrocracked	64741-77-1
Distillates (petroleum), hydrotreated light	64742-47-8
kerosine (petroleum), hydrodesulfurized	64742-81-0
Kerosine (petroleum)	Not Assigned
Xylene, mixed isomers	1330-20-7
Ethylbenzene	100-41-4
Trimethylbenzene (all isomers)	25551-13-7

Naphthalene	91-20-3
Toluene	108-88-3
Cumene	98-82-8

California Prop. 65

WARNING: This product can expose you to chemicals including Toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

Distillates (petroleum), hydrotreated light	64742-47-8
Xylene, mixed isomers	1330-20-7
Ethylbenzene	100-41-4
Trimethylbenzene (all isomers)	25551-13-7

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity) 2, 2, 0

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	:	USA. Occupational Exposure Limits (OSHA) - Table Z-2
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-2 / TWA	:	8-hour time weighted average
OSHA Z-2 / CEIL	:	Acceptable ceiling concentration
OSHA Z-2 / Peak	:	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); LSPN - List of Hazardous Notified Substances (Chile); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

This product is intended for use in closed systems only.
A vertical bar (|) in the left margin indicates an amendment from the previous version.

Sources of key data used to compile the Safety Data Sheet	:	The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).
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