SAFETY DATA SHEET

Shell FuelSave Unleaded 95

Version 4.0	Revision Date 14.03.2025	Print Date 15.03.2025

1. IDENTIFICATION OF THE HAZARDOUS CHEMICALS AND OF THE SUPPLIER

Product name : Shell FuelSave Unleaded 95

Product code : 002D6147

Manufacturer or supplier's details

Supplier : Shell Malaysia Trading Sdn Bhd
(196501000279)
Menara Shell
No. 211 Jalan Tun Sambanthan
50470 Kuala Lumpur
Malaysia

Telephone : (+60) 3 2385 2888

Telefax : Fuels: 1 300 13 7303 - Lubricants: 1 300 13 7800

Emergency telephone number : 1 800 88 3899

Contact for Safety Data Sheet : If you have any enquiries about the content of this SDS please email fuelSDS@shell.com

Recommended use of the chemical and restrictions on use

Recommended use : Fuel for spark ignition engines designed to run on unleaded fuel.

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., This product is designed only to suit automotive applications and no provision is made for the requirements of aviation applications.

2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids	:	Category 1
Skin irritation	:	Category 2
Carcinogenicity	:	Category 1B
Germ cell mutagenicity	:	Category 1B
Aspiration hazard	:	Category 1
Specific target organ toxicity - single exposure (Inhalation)	:	Category 3 (Narcotic effects)
Reproductive toxicity	:	Category 2
Hazardous to the aquatic environment - chronic hazard	:	Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : PHYSICAL HAZARDS:
H224 Extremely flammable liquid and vapour.
HEALTH HAZARDS:
H315 Causes skin irritation.
H340 May cause genetic defects.
H350 May cause cancer.
H304 May be fatal if swallowed and enters airways.
H336 May cause drowsiness or dizziness.
H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.
ENVIRONMENTAL HAZARDS:
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P331 Do NOT induce vomiting.

Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

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

Other hazards which do not result in classification

Moderately irritating to eyes.Slightly irritating to respiratory system.A component or components of this material may cause cancer.This product contains benzene which may cause leukaemia (AML - acute myelogenous leukaemia).May cause MDS (Myelodysplastic Syndrome).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.Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space.Ether oxygenates are significantly more water soluble and less biodegradable than benzene, toluene, ethyl benzene and xylenes (BTEX)

3. COMPOSITION AND INFORMATION OF THE INGREDIENTS OF THE HAZARDOUS CHEMICAL

Substance / Mixture : Mixture

3.2 Mixtures

Components

Chemical name	CAS-No.	Classification	Concentration (% w/w)
Methyl acetate	79-20-9	Flam. Liq.3; H225 Eye Irrit.2; H319 STOT SE3; H336	>= 0 - <= 2
sec-butyl acetate	105-46-4	Flam. Liq.2; H225	>= 0 - <= 5
2-methoxy-2-methylbutane	994-05-8	Flam. Liq.2; H225 Acute Tox.4; H302 STOT SE3; H336	>= 0 - <= 22
tert-butyl methyl ether	1634-04-4	Flam. Liq.2; H225	>= 0 - <= 22
Gasoline; Low boiling point naphtha -unspecified	86290-81-5	Flam. Liq.1; H224 Skin Irrit.2; H315 Carc.1B; H350 Muta.1B; H340 Asp. Tox.1; H304 STOT SE3; H336 Repr.2; H361fd Aquatic Chronic2; H411	>= 78 - <= 100
Ethyl tertiary butyl ether	637-92-3	Flam. Liq.2; H225 Asp. Tox.2; H305 STOT SE3; H336	>= 0 - <= 22

Dyes and markers can be used to indicate tax status and prevent fraud.
May also contain several additives at <0.1% v/v each.

For explanation of abbreviations see section 16.

Further information

Contains:

Chemical name	Identification number	Concentration (% w/w)
Xylene, mixed isomers	1330-20-7	5 - 25
Trimethylbenzene (all isomers)	25551-13-7	0 - 5

Benzene	71-43-2	0 - 3.5
Cumene	98-82-8	0 - 0.5
Cyclohexane	110-82-7	1 - 5
Ethylbenzene	100-41-4	1 - 5
Naphthalene	91-20-3	0 - 0.5
n-Hexane	110-54-3	0 - 5
Toluene	108-88-3	5 - 25

4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

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 : Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea.
The onset of respiratory symptoms may be delayed for several hours after exposure.
Skin irritation signs and symptoms may include a burning sensation, redness, or swelling.
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 and a temporary redness of the eye.
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.

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!
Treat symptomatically.
Call a doctor or poison control center for guidance.
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.
Potential for chemical pneumonitis.
Do not induce vomiting.

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

Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Clear fire area of all non-emergency personnel. If the fire cannot be extinguished the only course of action is to evacuate immediately. Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. 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.
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).
Hazchem Code	:	3YE

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	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 the vapour or to direct its flow to a safe location, for example by using fog sprays. Vapour can travel for considerable distances both above and below the ground surface. Underground services (drains, pipelines, cable ducts) can provide preferential flow paths.
Environmental precautions	:	Take measures to minimise the effects on groundwater. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Do not allow contact with soil, surface or ground water. Avoid entry into soil.
Methods and materials for containment and cleaning up	:	Take precautionary measures against static discharges. 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 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.

Avoid contact with skin, eyes and clothing.
Evacuate the area of all non-essential personnel.
Ventilate contaminated area thoroughly.
If contamination of site occurs remediation may require specialist advice.
Take precautionary measures against static discharges.
Ensure electrical continuity by bonding and grounding (earthing) all equipment.

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.
If contamination of site occurs remediation may require specialist advice.

To the extent that this product, including its chemical components (e.g. Methyl tertiary butyl ether) may impact surface or groundwater, appropriate assessment and remediation (if necessary) should be implemented.

7. HANDLING AND STORAGE

Handling

General Precautions : 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.
Prevent spillages.
Turn off all battery operated portable electronic devices (examples include: cellular phones, pagers and CD players) before operating gasoline pump.
Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.
Do not use as a cleaning solvent or other non-motor fuel uses.

Ensure that all local regulations regarding handling and storage facilities are followed.

General Precautions: Vehicle fueling and vehicle workshop areas - Avoid inhalation of vapours and contact with skin, when filling or emptying a vehicle.

Advice on safe handling : Avoid exposure.
When using do not eat or drink.
Never siphon by mouth.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
The vapour is heavier than air, spreads along the ground and distant ignition is possible.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Avoidance of contact : Strong oxidising agents.

Product Transfer : 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. 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.

Storage

Other data : Drum and small container storage:
Keep containers closed when not in use.
Drums should be stacked to a maximum of 3 high.
Use properly labeled and closable containers.
Packaged product must be kept tightly closed and stored in a diked (bunded) well-ventilated area, away from, ignition sources and other sources of heat.
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.
Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions.
Keep in a cool place.
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 mild steel, stainless steel., Aluminium may also be used for applications where it does not present an unnecessary fire hazard., Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM), which have been specifically tested for compatibility with this product., For container linings, use amine-adduct cured epoxy paint., For seals and gaskets use: graphite, PTFE, Viton A, Viton B.
Unsuitable material: Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene., However, some may be suitable for glove materials.

Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers. Gasoline containers must not be used for storage of other products.

Specific use(s) : Not applicable.

Ensure that all local regulations regarding handling and storage facilities are followed.
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).
IEC/TS 60079-32-1: Electrostatic hazards, guidance

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Xylene, mixed isomers	1330-20-7	TWA	100 ppm 434 mg/m3	MY PEL
Xylene, mixed isomers	1330-20-7	TWA	100 ppm 435 mg/m3	OSHA Z-1
Xylene, mixed isomers		TWA	20 ppm	ACGIH
Xylene, mixed isomers		STEL	150 ppm 655 mg/m3	OSHA P0
Xylene, mixed isomers		TWA	100 ppm 435 mg/m3	OSHA P0
Methyl acetate	79-20-9	TWA	200 ppm 606 mg/m3	MY PEL
Methyl acetate	79-20-9	TWA	200 ppm	ACGIH
Methyl acetate		STEL	250 ppm	ACGIH
Methyl acetate		TWA	200 ppm 610 mg/m3	OSHA Z-1
Trimethylbenzene (all isomers)	25551-13-7	TWA	25 ppm 123 mg/m3	MY PEL
Trimethylbenzene (all isomers)	25551-13-7	TWA	10 ppm	ACGIH
Trimethylbenzene (all isomers)		TWA	25 ppm 125 mg/m3	OSHA P0
sec-butyl acetate	105-46-4	TWA	200 ppm 950 mg/m3	MY PEL
sec-butyl acetate	105-46-4	TWA	200 ppm 950 mg/m3	OSHA Z-1
sec-butyl acetate		TWA	50 ppm	ACGIH
sec-butyl acetate		STEL	150 ppm	ACGIH
sec-butyl acetate		TWA	200 ppm 950 mg/m3	NIOSH REL
sec-butyl acetate		TWA	200 ppm 950 mg/m3	OSHA P0
Benzene	71-43-2	TWA	0.5 ppm 1.6 mg/m3	MY PEL
Benzene	71-43-2	TWA	0.25 ppm 0.8 mg/m3	Shell Internal Standard (SIS) for 8-12 hour TWA.
Benzene		STEL	2.5 ppm 8 mg/m3	Shell Internal Standard (SIS) for 15 min (STEL)
Benzene	71-43-2	STEL	2.5 ppm	ACGIH
Benzene	71-43-2	TWA	0.02 ppm	ACGIH
Benzene	71-43-2	STEL	2.5 ppm	ACGIH
Benzene		PEL	1 ppm	OSHA CARC
Benzene		STEL	5 ppm	OSHA CARC
Benzene		TWA	10 ppm	OSHA Z-2

Benzene		CEIL	25 ppm	OSHA Z-2
Benzene		Peak	50 ppm	OSHA Z-2
2-methoxy-2-methylbutane	994-05-8	TWA	20 ppm	ACGIH
Cumene	98-82-8	TWA	50 ppm 246 mg/m3	MY PEL
	Further information: Skin			
Cumene	98-82-8	TWA	50 ppm 245 mg/m3	NIOSH REL
Cumene		TWA	50 ppm 245 mg/m3	OSHA Z-1
Cumene		TWA	5 ppm	ACGIH
tert-butyl methyl ether	1634-04-4	TWA	40 ppm 144 mg/m3	MY PEL
tert-butyl methyl ether	1634-04-4	TWA	50 ppm	ACGIH
Cyclohexane	110-82-7	TWA	300 ppm 1,030 mg/m3	MY PEL
Cyclohexane	110-82-7	TWA	100 ppm	ACGIH
Cyclohexane		TWA	300 ppm 1,050 mg/m3	OSHA Z-1
Cyclohexane		TWA	300 ppm 1,050 mg/m3	NIOSH REL
Gasoline; Low boiling point naphtha -unspecified	Not Assigned	TWA	300 ppm	ACGIH
Gasoline; Low boiling point naphtha -unspecified	Not Assigned	STEL	500 ppm	ACGIH
Gasoline; Low boiling point naphtha -unspecified	Not Assigned	TWA	500 ppm 2,000 mg/m3	OSHA Z-1
Ethylbenzene	100-41-4	TWA	100 ppm 434 mg/m3	MY PEL
Ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
Ethylbenzene		TWA	100 ppm 435 mg/m3	NIOSH REL
Ethylbenzene		ST	125 ppm 545 mg/m3	NIOSH REL
Ethylbenzene		TWA	100 ppm 435 mg/m3	OSHA Z-1
Ethyl tertiary butyl ether	637-92-3	TWA	25 ppm	ACGIH
Naphthalene	91-20-3	TWA	10 ppm 52 mg/m3	MY PEL
Naphthalene	91-20-3	TWA	10 ppm 50 mg/m3	NIOSH REL
Naphthalene		ST	15 ppm 75 mg/m3	NIOSH REL
Naphthalene		TWA	10 ppm 50 mg/m3	OSHA Z-1
Naphthalene		TWA	10 ppm	ACGIH
n-Hexane	110-54-3	TWA	50 ppm 176 mg/m3	MY PEL
	Further information: Skin			
n-Hexane	110-54-3	TWA	500 ppm 1,800 mg/m3	OSHA Z-1
n-Hexane		TWA	50 ppm	ACGIH

Toluene	108-88-3	TWA	50 ppm 188 mg/m3	MY PEL
	Further information: Skin			
Toluene	108-88-3	TWA	20 ppm	ACGIH
Toluene		TWA	200 ppm	OSHA Z-2
Toluene		CEIL	300 ppm	OSHA Z-2
Toluene		Peak	500 ppm	OSHA Z-2

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

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and

coveralls to prevent skin contamination; wear respiratory protection when there is potential for inhalation; clear up spills immediately and dispose of wastes safely.Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
Do not ingest. If swallowed, then seek immediate medical assistance

Personal protective equipment

Protective measures

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

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 suitable, select an appropriate combination of mask and filter. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. All respiratory protection equipment and use must be in accordance with local regulations. Select a filter suitable for the combination of organic gases and vapours and particles [Type A/Type P boiling point >65°C (149°F)].
Hand protection Remarks	:	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. 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. 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.

Select gloves tested to a relevant standard (e.g. Europe EN374, US F739). When prolonged or frequent repeated contact occurs, Nitrile gloves may be suitable. (Breakthrough time of > 240 minutes.) For incidental contact/splash protection Neoprene, PVC gloves may be suitable.

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.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Section 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	Undyed
Odour	:	Not applicable
Odour Threshold	:	Data not available
pH	:	Not applicable
Freezing point	:	-60 °C / -76 °F
Melting point/freezing point		Data not available
Boiling point/boiling range	:	25 - 220 °C / 77 - 428 °F
Flash point	:	<= -40 °C / -40 °F
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	8 %(V)

Lower explosion limit	:	1 %(V)
Vapour pressure	:	30 - 65 kPa (38.0 °C / 100.4 °F) Method: Unspecified
		50 - 160 kPa (50.0 °C / 122.0 °F) Method: Unspecified
Density	:	725 - 780 kg/m3 (15 °C / 59 °F)
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	log Pow: ca. 1.43 - 7
Auto-ignition temperature	:	> 250 °C / 482 °F
Decomposition temperature	:	Data not available
Viscosity		
Viscosity, kinematic	:	0.25 - 0.75 mm2/s (40 °C / 104 °F)
Particle characteristics		
Particle size	:	Data not available
Explosive properties	:	Classification Code: Not classified.
Oxidizing properties	:	Not applicable
Conductivity	:	Low conductivity: < 100 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

10. STABILITY AND REACTIVITY

Reactivity	:	May oxidise in the presence of air.
Chemical stability	:	Stable under normal conditions of use.
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.

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).
Symptoms of Overexposure	:	Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea. The onset of respiratory symptoms may be delayed for several hours after exposure. Skin irritation signs and symptoms may include a burning sensation, redness, or swelling. 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 and a temporary redness of the eye. 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.

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: > 5 mg/l
Exposure time: 4 h
Remarks: Low toxicity

Remarks: Based on human experience, breathing of vapours or mists may cause a temporary burning sensation to nose, throat and lungs.

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

Acute toxicity (other routes of administration) :

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

Components:

2-methoxy-2-methylbutane:

Acute oral toxicity : LD50 Oral Rat, female: 1,602 mg/kg
Method: Test(s) equivalent or similar to OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC 50 Rat, male and female: > 5,400 mg/l
Exposure time: 4 h
Method: Test(s) equivalent or similar to OECD Test Guideline 403
Remarks: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD50 Dermal Rabbit, male and female: >= 2,000 mg/kg
Method: Test(s) equivalent or similar to OECD Test Guideline 402
Remarks: Based on available data, the classification criteria are not met.

tert-butyl methyl ether:

Acute oral toxicity : LD 50 Rat, male and female:
Method: OECD Test Guideline 401

Remarks: May be harmful if swallowed.

Acute inhalation toxicity : LC 50 Rat, male and female: > 85 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Test(s) equivalent or similar to OECD Test Guideline 403
Remarks: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD 50 Rat, male and female: > 2,000 mg/kg
Method: OECD Test Guideline 402
Remarks: Based on available data, the classification criteria are not met.

Gasoline; Low boiling point naphtha -unspecified:

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

Remarks: Based on human experience, breathing of vapours or mists may cause a temporary burning sensation to nose, throat and lungs.

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

Acute toxicity (other routes of administration) :
Remarks: Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

Ethyl tertiary butyl ether:

Acute oral toxicity : LD50 Oral Rat, male and female: > 2,000 mg/kg
Method: Test(s) equivalent or similar to OECD Test Guideline 401
Remarks: Based on available data, the classification criteria are not met.

Acute inhalation toxicity : LC 50 Rat, male and female: > 5.88 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Test(s) equivalent or similar to OECD Test Guideline 403
Remarks: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD50 Dermal Rabbit, male and female: > 2,000 mg/kg
Method: Test(s) equivalent or similar to OECD Test Guideline 402
Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks: Irritating to skin.

Components:

2-methoxy-2-methylbutane:
Species: Rabbit
Exposure time: 4 h
Method: Test(s) equivalent or similar to OECD Test Guideline 404
Remarks: Based on available data, the classification criteria are not met.

tert-butyl methyl ether:
Species: Rabbit
Method: OECD Test Guideline 404
Remarks: May irritate skin.

Gasoline; Low boiling point naphtha -unspecified:
Remarks: Irritating to skin.

Ethyl tertiary butyl ether:
Species: Rabbit
Method: Test(s) equivalent or similar to OECD Test Guideline 404
Remarks: Slightly irritating., Insufficient to classify.

Serious eye damage/eye irritation

Product:

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

Components:

2-methoxy-2-methylbutane:
Species: Rabbit
Exposure time: 24 h
Method: Test(s) equivalent or similar to OECD Test Guideline 405
Remarks: Based on available data, the classification criteria are not met.

tert-butyl methyl ether:
Species: Rabbit
Method: OECD Test Guideline 405
Remarks: Slightly irritating to the eye., Based on available data, the classification criteria are not

met.

Gasoline; Low boiling point naphtha -unspecified:
Remarks: Slightly irritating to the eye., Based on available data, the classification criteria are not met.

Ethyl tertiary butyl ether:
Species: Rabbit
Method: Test(s) equivalent or similar to OECD Test Guideline 405
Remarks: Slightly irritating., 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:

2-methoxy-2-methylbutane:
Test Method: Buehler Test
Species: Guinea pig
Remarks: Based on available data, the classification criteria are not met.

tert-butyl methyl ether:
Species: Guinea pig
Method: Test(s) equivalent or similar to OECD Test Guideline 406
Remarks: Based on available data, the classification criteria are not met.

Gasoline; Low boiling point naphtha -unspecified:
Remarks: Not a sensitiser.
Based on available data, the classification criteria are not met.

Ethyl tertiary butyl ether:
Species: Guinea pig
Method: Test(s) equivalent or similar to OECD Test Guideline 406
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

: Remarks: Contains Benzene, CAS # 71-43-2., May cause heritable genetic damage

Remarks: Mutagenicity studies on gasoline and gasoline blending streams have shown predominantly negative results.

Components:

2-methoxy-2-methylbutane:
Genotoxicity in vitro : Type: gene mutation test

Test species: mammalian cells
Remarks: Based on available data, the classification criteria are not met.

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

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

tert-butyl methyl ether:

Genotoxicity in vitro : Method: OECD Test Guideline 471
Remarks: Based on available data, the classification criteria are not met.

: Method: Test(s) equivalent or similar to OECD Test Guideline 476
Remarks: Based on available data, the classification criteria are not met.

: Test species: MouseMethod: Test(s) equivalent or similar to OECD Test Guideline 486
Remarks: Based on available data, the classification criteria are not met.

Test species: MouseMethod: Other guideline method.
Remarks: Based on available data, the classification criteria are not met.

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

Gasoline; Low boiling point naphtha -unspecified:

: Remarks: Contains Benzene, CAS # 71-43-2., May cause heritable genetic damage

Remarks: Mutagenicity studies on gasoline and gasoline blending streams have shown predominantly negative results.

Ethyl tertiary butyl ether:

Genotoxicity in vitro : Method: Test(s) equivalent or similar to OECD Guideline 471
Remarks: Based on available data, the classification criteria are not met.

: Method: OECD Test Guideline 476
Remarks: Based on available data, the classification criteria are not met.

: Method: OECD Test Guideline 473
Remarks: Based on available data, the classification criteria are not met.

: Test species: MouseMethod: OECD Test Guideline 474
Remarks: Based on available data, the classification criteria are not met.

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

Carcinogenicity

Product:

Remarks: Contains Benzene, CAS # 71-43-2., Known human carcinogen.

Remarks: Contains Benzene, CAS # 71-43-2., May cause leukaemia (AML - acute myelogenous leukaemia)., May cause MDS (Myelodysplastic Syndrome).

Remarks: Inhalation exposure to mice causes liver tumours, which are not considered relevant to humans.

Remarks: An epidemiology study of more than 18,000 petroleum marketing and distribution workers found no significantly increased risk of death from leukemia, multiple myeloma, or kidney cancer associated with gasoline exposure.

Components:

2-methoxy-2-methylbutane:

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

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

tert-butyl methyl ether:
Species: Rat, (male and female)
Application Route: Inhalation
Method: Other guideline method.
Remarks: Based on available data, the classification criteria are not met.

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

Gasoline; Low boiling point naphtha -unspecified:

Remarks: Contains Benzene, CAS # 71-43-2., Known human carcinogen.

Remarks: Contains Benzene, CAS # 71-43-2., May cause leukaemia (AML - acute myelogenous leukaemia)., May cause MDS (Myelodysplastic Syndrome).

Remarks: Inhalation exposure to mice causes liver tumours, which are not considered relevant to humans.

Remarks: An epidemiology study of more than 18,000 petroleum marketing and distribution workers found no significantly increased risk of death from leukemia, multiple myeloma, or kidney cancer associated with gasoline exposure.

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

Material	GHS/CLP Carcinogenicity Classification
Methyl acetate	No carcinogenicity classification.
Xylene, mixed isomers	No carcinogenicity classification.
sec-butyl acetate	No carcinogenicity classification.
Trimethylbenzene (all isomers)	No carcinogenicity classification.
2-methoxy-2-methylbutane	No carcinogenicity classification.
Benzene	Carcinogenicity Category 1A
tert-butyl methyl ether	No carcinogenicity classification.
Cumene	No carcinogenicity classification.
Gasoline; Low boiling point naphtha -unspecified	Carcinogenicity Category 1B
Cyclohexane	No carcinogenicity classification.
Ethyl tertiary butyl ether	No carcinogenicity classification.
Ethylbenzene	No carcinogenicity classification.
Naphthalene	Carcinogenicity Category 2
n-Hexane	No carcinogenicity classification.
Toluene	No carcinogenicity classification.

Material	Other Carcinogenicity Classification
Xylene, mixed isomers	IARC: Group 3: Not classifiable as to its carcinogenicity to humans
Benzene	IARC: Group 1: Carcinogenic to humans
tert-butyl methyl ether	IARC: Group 3: Not classifiable as to its carcinogenicity to humans
Cumene	IARC: Group 2B: Possibly carcinogenic to humans
Gasoline; Low boiling point naphtha -unspecified	IARC: Group 2B: Possibly carcinogenic to humans
Ethylbenzene	IARC: Group 2B: Possibly carcinogenic to humans
Naphthalene	IARC: Group 2B: Possibly carcinogenic to humans

Toluene	IARC: Group 3: Not classifiable as to its carcinogenicity to humans

Reproductive toxicity

Product:

:

Remarks: Contains Toluene, CAS # 108-88-3., Causes foetotoxicity at doses which are maternally toxic.

Remarks: Contains n-Hexane, CAS # 110-54-3., May impair fertility at doses which produce other toxic effects.

Remarks: Contains Toluene, CAS # 108-88-3., Many case studies involving abuse during pregnancy indicate that toluene can cause birth defects, growth retardation and learning difficulties.

Remarks: Inhalation of high concentrations of gasoline vapour containing Methyl tertiary butyl ether produced a very low incidence of rare birth defects (ventral midline closure failure) in mice.

Components:

2-methoxy-2-methylbutane:

: Test Type: Two-generation study
Species: Rat, male and female
Dose: <3000 parts per million
Duration of Single Treatment: 6 h
Frequency of Treatment: 5 days/week
General Toxicity - Parent: No observed effect concentration: 250 ppm
General Toxicity F1: No observed effect concentration: 250 ppm
Result: Animal testing did not show any effects on fertility.

Effects on foetal development : Species: Rabbit, male and female
Remarks: Based on available data, the classification criteria are not met.
Species: Rat, female
Remarks: Based on available data, the classification criteria are not met.

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

tert-butyl methyl ether:

Species: Rat
Sex: male and female

Application Route: Inhalation

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

Species: Rat, female
Application Route: Inhalation
Method: Test(s) equivalent or similar to OECD Test Guideline 414
Remarks: Based on available data, the classification criteria are not met.
Species: Rabbit, female
Application Route: Inhalation
Method: Other guideline method.
Remarks: Based on available data, the classification criteria are not met.

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

Gasoline; Low boiling point naphtha -unspecified:

Remarks: Contains Toluene, CAS # 108-88-3., Causes foetotoxicity at doses which are maternally toxic.

Remarks: Contains n-Hexane, CAS # 110-54-3., May impair fertility at doses which produce other toxic effects.

Remarks: Contains Toluene, CAS # 108-88-3., Many case studies involving abuse during pregnancy indicate that toluene can cause birth defects, growth retardation and learning difficulties.

Remarks: Inhalation of high concentrations of gasoline vapour containing Methyl tertiary butyl ether produced a very low incidence of rare birth defects (ventral midline closure failure) in mice.

Ethyl tertiary butyl ether:

Species: Rat
Sex: male and female
Application Route: Oral

Method: Equivalent or similar to OECD Test Guideline 416
Remarks: Based on available data, the classification criteria are not met.

Species: Rat, female
Application Route: Oral
Method: OECD Test Guideline 414

Remarks: Based on available data, the classification criteria are not met.
Species: Rabbit, female
Application Route: Oral
Method: OECD Test Guideline 414
Remarks: Based on available data, the classification criteria are not met.

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

STOT - single exposure

Product:

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

Components:

2-methoxy-2-methylbutane:
Exposure routes: Inhalation
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects., May cause drowsiness or dizziness.

tert-butyl methyl ether:
Remarks: Based on available data, the classification criteria are not met., Slightly irritating to respiratory system., Vapours may cause drowsiness and dizziness.

Gasoline; Low boiling point naphtha -unspecified:
Remarks: High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness.

Ethyl tertiary butyl ether:
Exposure routes: Inhalation
Target Organs: Central nervous system
Remarks: May cause drowsiness or dizziness.

STOT - repeated exposure

Product:

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

Components:

2-methoxy-2-methylbutane:
Remarks: Based on available data, the classification criteria are not met.

tert-butyl methyl ether:

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

Gasoline; Low boiling point naphtha -unspecified:
Remarks: Kidney: caused kidney effects in male rats which are not considered relevant to humans

Ethyl tertiary butyl ether:
Remarks: Based on available data, the classification criteria are not met.

Repeated dose toxicity

Components:

tert-butyl methyl ether:

Rat, male and female:
Application Route: Oral
Method: Test(s) equivalent or similar to OECD Test Guideline 408
Target Organs: No specific target organs noted

Rat, male and female:
Application Route: Inhalation
Test atmosphere: vapour
Method: Literature data
Target Organs: No specific target organs noted

Ethyl tertiary butyl ether:

Rat, male and female:
Application Route: Oral
Method: Test(s) equivalent or similar to OECD Test Guideline 453
Target Organs: No specific target organs noted

Rat, male and female:
Application Route: Inhalation
Test atmosphere: vapour
Method: Test(s) equivalent or similar to OECD Test Guideline 453
Target Organs: No specific target organs noted

Aspiration toxicity

Product:

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

Components:
2-methoxy-2-methylbutane:
Based on available data, the classification criteria are not met.

tert-butyl methyl ether:
Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which

can be fatal.

Gasoline; Low boiling point naphtha -unspecified:
Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Further information

Product:

Remarks: Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

Remarks: Contains Toluene, CAS # 108-88-3., Prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats. Solvent abuse and noise interaction in the work environment may cause hearing loss.

Remarks: Contains Toluene, CAS # 108-88-3., Abuse of vapours has been associated with organ damage and death.

Remarks: Contains Benzene, CAS # 71-43-2., May cause MDS (Myelodysplastic Syndrome).

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

Components:
2-methoxy-2-methylbutane:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

tert-butyl methyl ether:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

Gasoline; Low boiling point naphtha -unspecified:
Remarks: Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

Remarks: Contains Toluene, CAS # 108-88-3., Prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats. Solvent abuse and noise interaction in the work environment may cause hearing loss.

Remarks: Contains Toluene, CAS # 108-88-3., Abuse of vapours has been associated with organ damage and death.

Remarks: Contains Benzene, CAS # 71-43-2., May cause MDS (Myelodysplastic Syndrome).

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

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 (Acute toxicity) :
Remarks: LL/EL/IL50 > 1 <= 10 mg/l
Toxic

Toxicity to crustacean (Acute toxicity) :
Remarks: LL/EL/IL50 > 1 <= 10 mg/l
Toxic

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

Toxicity to fish (Chronic toxicity) : Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l

Toxicity to crustacean (Chronic toxicity) : Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l

Toxicity to microorganisms (Acute toxicity) : Remarks: LL/EL/IL50 >10 <= 100 mg/l
Harmful

Components:
2-methoxy-2-methylbutane :

Toxicity to fish (Acute toxicity) : LC50 (Fish (freshwater)): 580 mg/l
Exposure time: 96 h
Remarks: Based on available data, the classification criteria are not met.

Toxicity to crustacean (Acute toxicity) : EC50 (Daphnia magna (Water flea)): 100 mg/l
Exposure time: 48 h
Remarks: Based on available data, the classification criteria are not met.

Toxicity to algae/aquatic plants (Acute toxicity) : ErC50 (Pseudokirchneriella subcapitata (green algae)): 780 mg/l
Exposure time: 72 h
Remarks: Based on available data, the classification criteria are not met.

Toxicity to microorganisms (Acute toxicity)	:	EC10 (Pseudomonas putida): 25 mg/l Exposure time: 16 h Remarks: Based on available data, the classification criteria are not met.
Toxicity to fish (Chronic toxicity)	:	NOEC: 29.9 mg/l Species: Pimephales promelas (fathead minnow) Remarks: Based on available data, the classification criteria are not met.
Toxicity to crustacean(Chronic toxicity)	:	NOEC: 5.1 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Remarks: Based on available data, the classification criteria are not met.

tert-butyl methyl ether :

Toxicity to fish (Acute toxicity)	:	LC50 (Menidia beryllina (Silverside)): 574 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to crustacean (Acute toxicity)	:	EC50 (Americamysis bahia): 187 mg/l Exposure time: 96 h Method: Test(s) equivalent or similar to OECD Guideline 202 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	IC50 (Scenedesmus capricornutum (fresh water algae)): 103 mg/l Exposure time: 96 h Method: Test(s) equivalent or similar to OECD Test Guideline 201 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to microorganisms (Acute toxicity)	:	EC10 (Pseudomonas putida): 710 mg/l Exposure time: 18 h Method: Test(s) equivalent or similar to OECD Guideline 209 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	NOEC: 299 mg/l Exposure time: 31 d Species: Pimephales promelas (fathead minnow) Method: Test(s) equivalent or similar to OECD Guideline 210 Remarks: NOEC/NOEL > 100 mg/l
Toxicity to crustacean(Chronic toxicity)	:	26 mg/l Exposure time: 28 d Species: Americamysis bahia Method: Test(s) equivalent or similar to OECD Guideline 210

Remarks: NOEC/NOEL > 10 - <=100 mg/l

Gasoline; Low boiling point naphtha -unspecified :

Toxicity to fish (Acute toxicity)	:	Remarks: LL/EL/IL50 > 1 <= 10 mg/l Toxic
Toxicity to crustacean (Acute toxicity)	:	Remarks: LL/EL/IL50 > 1 <= 10 mg/l Toxic
Toxicity to algae/aquatic plants (Acute toxicity)	:	Remarks: LL/EL/IL50 > 1 <= 10 mg/l Toxic
Toxicity to microorganisms (Acute toxicity)	:	Remarks: LL/EL/IL50 >10 <= 100 mg/l Harmful
Toxicity to fish (Chronic toxicity)	:	Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l
Toxicity to crustacean(Chronic toxicity)	:	Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l

Ethyl tertiary butyl ether :

Toxicity to fish (Acute toxicity)	:	LC50 (Poecilia reticulata (guppy)): > 974 mg/l Exposure time: 96 h Method: Test(s) equivalent or similar to OECD Guideline 203 Remarks: Practically non toxic, LC/EC/IC 50 > 100 mg/l .
Toxicity to crustacean (Acute toxicity)	:	EC50 (Americamysis bahia): 37 mg/l Exposure time: 96 h Remarks: Harmful LL/EL/IL50 >10 <= 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	EC50 (Selenastrum capricornutum (green algae)): 1,100 mg/l Exposure time: 72 h Method: Test(s) equivalent or similar to OECD Test Guideline 201 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to microorganisms (Acute toxicity)	:	EC50 (Pseudomonas putida): 510 mg/l Exposure time: 16 h Method: Information given is based on data obtained from similar substances. Remarks: Practically non toxic, LC/EC/IC 50 > 100 mg/l .
Toxicity to fish (Chronic toxicity)	:	NOEC: 299 mg/l Exposure time: 31 d Species: Pimephales promelas (fathead minnow) Method: Information given is based on data obtained from similar substances. Remarks: NOEC/NOEL > 1.0 - <=10 mg/l (based on test data)
Toxicity to crustacean(Chronic toxicity)	:	NOEC: 3.39 mg/l Species: Americamysis bahia Method: Information given is based on data obtained from

similar substances.
Remarks: NOEC/NOEL > 1.0 - <=10 mg/l (based on test data)

Persistence and degradability

Product:

Biodegradability : Remarks: The volatile constituents will oxidize rapidly by photochemical reactions in air., Major constituents are inherently biodegradable, but contains components that may persist in the environment., 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:
2-methoxy-2-methylbutane :

Biodegradability : Remarks: Not readily biodegradable.

tert-butyl methyl ether :

Biodegradability : Biodegradation: 9.24 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
Remarks: Not readily biodegradable.

Gasoline; Low boiling point naphtha -unspecified :

Biodegradability : Remarks: The volatile constituents will oxidize rapidly by photochemical reactions in air.
Major constituents are inherently biodegradable, but contains components that may persist in the environment.
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."

Ethyl tertiary butyl ether :

Biodegradability : Biodegradation: 6.6 %
Exposure time: 7 d
Method: Test(s) equivalent or similar to OECD Guideline 301D
Remarks: Not readily biodegradable.

Bioaccumulative potential

Product:

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

Partition coefficient: n-octanol/water : log Pow: ca. 1.43 - 7

Components:

2-methoxy-2-methylbutane :

Bioaccumulation : Remarks: Substance is not persistent, bioaccumulative, and toxic (PBT).

tert-butyl methyl ether :

Bioaccumulation : Species: Cyprinus carpio (Carp)
Exposure time: 28 d
Bioconcentration factor (BCF): 1.5
Method: Test(s) equivalent or similar to OECD Test Guideline 305
Remarks: Does not bioaccumulate significantly.

Gasoline; Low boiling point naphtha -unspecified :

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

Ethyl tertiary butyl ether :

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Mobility in soil

Product:

Mobility : Remarks: Evaporates within a day from water or soil surfaces., Large volumes may penetrate soil and could contaminate groundwater., Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment., Contains volatile components., Floats on water.
Remarks: Ether oxygenates are significantly more water soluble and less biodegradable than benzene, toluene, ethyl benzene and xylenes (BTEX)

Components:

2-methoxy-2-methylbutane :

Mobility : Remarks: The product is insoluble and floats on water.

tert-butyl methyl ether :

Mobility : Remarks: Floats on water., If product enters soil, it will be highly mobile and may contaminate groundwater.

Gasoline; Low boiling point naphtha -unspecified :

Mobility : Remarks: Evaporates within a day from water or soil surfaces., Large volumes may penetrate soil and could contaminate groundwater., Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment., Contains volatile components., Floats on water.
Remarks: Ether oxygenates are significantly more water soluble and less biodegradable than benzene, toluene, ethyl benzene and xylenes (BTEX)

Ethyl tertiary butyl ether :

Mobility : Remarks: If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater.

Other adverse effects

Product:

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

Components:

2-methoxy-2-methylbutane :

Additional ecological information : None

tert-butyl methyl ether :

Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

Gasoline; Low boiling point naphtha -unspecified :

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

Ethyl tertiary butyl ether :

Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

13 DISPOSAL INFORMATION

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 : Drain container thoroughly.
After draining, vent in a safe place away from sparks and fire.
Residues may cause an explosion hazard.
Do not puncture, cut, or weld uncleaned drums.

Send to drum recoverer or metal reclaimer.
Do not pollute the soil, water or environment with the waste container.

14. TRANSPORTATION INFORMATION

National Regulations

Hazchem Code : 3YE

International Regulations

ADR

UN number	:	1203
Proper shipping name	:	GASOLINE
Class	:	3
Packing group	:	II
Labels	:	3
Environmentally hazardous	:	yes

IATA-DGR

UN/ID No.	:	UN 1203
Proper shipping name	:	GASOLINE
Class	:	3
Packing group	:	II
Labels	:	3

IMDG-Code

UN number	:	UN 1203
Proper shipping name	:	GASOLINE
Class	:	3
Packing group	:	II
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.

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.

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000.

OSHA 1994 and relevant regulations.

Factories and Machinery Act 1967 and relevant regulations.

Petroleum (Safety Measures) Act 1984.

Environmental Quality Act 1974 and regulation.

Road Transport (Construction & Use) Dangerous Goods Vehicles Rules 2015.

Motor Vehicles (Construction, Equipment and Use) (Use of Liquefied Petroleum Gas Fuel System in Motor Vehicles) Rules 1982 – P.U. (A) 392/82 under Road Transport Act, 1987.

16. OTHER INFORMATION

Full text of H-Statements

H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H305	May be harmful if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H411	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	Acute toxicity
Aquatic Chronic	Hazardous to the aquatic environment - chronic hazard
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
Muta.	Germ cell mutagenicity
Repr.	Reproductive toxicity
Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity - single exposure

Abbreviations and Acronyms

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with

x% response; 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 Harmonized System; GLP - Good Laboratory Practice; 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 Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; 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); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; 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; WHMIS - Workplace Hazardous Materials Information System

Further information

Other information : This product is intended for use in closed systems only.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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