

# SAFETY DATA SHEET

## Shell FuelSave Gasohol E20

Version 4.0

Revision Date 29.03.2024

Print Date 30.03.2024

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Shell FuelSave Gasohol E20  
Product code : 002D3030

#### Manufacturer or supplier's details

Supplier : The Shell Company of Thailand Ltd  
Klongtoey  
10 Soonthornkosa Road  
Bangkok  
10110  
Thailand

Telephone : (+66) 26579888  
Telefax : (+66) 26579609

Emergency telephone number : +66 (0) 2262-7333

**Contact for Safety Data Sheet** : If you have any enquiries about the content of this SDS please email [fuelSDS@shell.com](mailto: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 recommended in Section 1, without first seeking the advice of the supplier., This product is designed only to suit automotive applications and no provision is made for the requirements of aviation applications., This product is not to be used as a solvent or cleaning agent; for lighting or brightening fires; as a skin cleanser.

### 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  
Short-term (acute) aquatic hazard : Category 2  
Long-term (chronic) aquatic hazard : Category 2

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### 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:**  
H401 Toxic to aquatic life.  
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements

:  
**Prevention:**  
P201 Obtain special instructions before use.  
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/ doctor.  
P331 Do NOT induce vomiting.  
**Storage:**  
P403 + P235 Store in a well-ventilated place. Keep cool.  
**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. Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space. This product contains benzene which may cause leukaemia (AML - acute myelogenous leukaemia). 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. May cause MDS (Myelodysplastic

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Syndrome).

### 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 C4 to C12 range.  
Contains oxygenated hydrocarbons, including ethanol or other alcohols.  
May also contain several additives at <0.1% v/v each.

#### Hazardous components

Chemical name	CAS-No.	Classification	Concentration (% w/w)
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 Acute2; H401 Aquatic Chronic2; H411	>= 80 - <= 81
Ethanol	64-17-5	Flam. Liq.2; H225 Eye Irrit.2; H319	>= 19 - <= 20

Dyes and markers can be used to indicate tax status and prevent fraud.

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
Toluene	108-88-3	5 - 25
Trimethylbenzene (all isomers)	25551-13-7	0 - 5
n-Hexane	110-54-3	0 - 5
Cyclohexane	110-82-7	1 - 5
Ethylbenzene	100-41-4	1 - 5
Benzene	71-43-2	0 - 1
Naphthalene	91-20-3	0 - 0.5
Cumene	98-82-8	0 - 0.5

### 4. FIRST-AID MEASURES

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

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- 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.  
Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.  
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.  
Liver damage may be indicated by loss of appetite, jaundice (yellowish skin and eye colour), fatigue, bleeding or easy bruising and sometimes pain and swelling in the upper right abdomen.

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- 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!  
Persons on disulfiram (Antabuse®) therapy should be aware that the ethyl alcohol in this product is hazardous to them just as is alcohol from any source. Disulfiram reactions (vomiting, headache and even collapse) may follow ingestion of small amounts of alcohol and have also been described from skin contact.  
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.  
Treat symptomatically.  
Call a doctor or poison control center for guidance.

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### 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Alcohol-resistant 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.  
Keep adjacent containers cool by spraying with water.

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If possible remove containers from the danger zone.  
If the fire cannot be extinguished the only course of action is to evacuate immediately.  
Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

Prevent fire extinguishing water from contaminating surface water or the ground water system.

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).

### 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 vapour or to direct its flow to a safe location for example 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.

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.

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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.

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### 7. HANDLING AND STORAGE

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.  
Do not use as a cleaning solvent or other non-motor fuel uses.  
Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.  
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 : Ensure that all local regulations regarding handling and storage facilities are followed.  
When using do not eat or drink.  
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.  
Never siphon by mouth.  
The vapour is heavier than air, spreads along the ground and distant ignition is possible.

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Avoid exposure.  
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.

Avoidance of contact

: Strong oxidising agents.

Product Transfer

: 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. 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 ( $\leq 1$  m/s until fill pipe submerged to twice its diameter, then  $\leq 7$  m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations.

### 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.  
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.  
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.  
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.

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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.  
  
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 AND PERSONAL PROTECTION

#### Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Cumene	98-82-8	TWA	50 ppm	TH OEL
Cumene	98-82-8	TWA	50 ppm 245 mg/m <sup>3</sup>	NIOSH REL
Cumene		TWA	50 ppm 245 mg/m <sup>3</sup>	OSHA Z-1
Cumene		TWA	5 ppm	ACGIH
Trimethylbenzene (all isomers)	25551-13-7	TWA	10 ppm	ACGIH
Trimethylbenzene (all isomers)		TWA	25 ppm 125 mg/m <sup>3</sup>	OSHA P0

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n-Hexane	110-54-3	TWA	500 ppm	TH OEL
n-Hexane	110-54-3	TWA	500 ppm 1,800 mg/m3	OSHA Z-1
n-Hexane		TWA	50 ppm	ACGIH
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
Xylene, mixed isomers	1330-20-7	TWA	100 ppm	TH OEL
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
Toluene	108-88-3	TWA	200 ppm	TH OEL
Toluene		CEIL	300 ppm	TH OEL
Toluene		PEAK	500 ppm	TH OEL
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
Ethanol	64-17-5	TWA	1,000 ppm	TH OEL
Ethanol	64-17-5	STEL	1,000 ppm	ACGIH
Ethanol		TWA	1,000 ppm 1,900 mg/m3	OSHA Z-1
Ethanol		TWA	1,000 ppm 1,900 mg/m3	NIOSH REL
Ethylbenzene	100-41-4	TWA	100 ppm	TH OEL
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
Cyclohexane	110-82-7	TWA	300 ppm	TH OEL
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
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
Benzene	71-43-2	TWA	1 ppm	TH OEL

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Benzene		PEAK	5 ppm	TH OEL
Benzene	71-43-2	TWA	0.25 ppm 0.8 mg/m <sup>3</sup>	Shell Internal Standard (SIS) for 8-12 hour TWA.
Benzene		STEL	2.5 ppm 8 mg/m <sup>3</sup>	Shell Internal Standard (SIS) for 15 min (STEL)
Benzene	71-43-2	STEL	2.5 ppm	ACGIH
Benzene	71-43-2	TWA	0.5 ppm	ACGIH
Benzene		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

### 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 Sécurité, (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:

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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

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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 : brown
- Odour : Not applicable
- Odour Threshold : Data not available
- pH : Not applicable
- Melting point/freezing point : Data not available
- Boiling point/boiling range : 25 - 210 °C / 77 - 410 °F Method: Unspecified
- Flash point : <= -40 °C / <= -40 °F

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Evaporation rate	: Data not available
Flammability (solid, gas)	: Not applicable
Upper explosion limit	: 8 %(V)
Lower explosion limit	: 1 %(V)
Vapour pressure	: 30 - 90 kPa (38.0 °C / 100.4 °F) Method: Unspecified
	50 - 160 kPa (50.0 °C / 122.0 °F) Method: Unspecified
Relative vapour density	: Data not available
Relative density	: Data not available
Density	: 725 - 775 kg/m <sup>3</sup> (15.0 °C / 59.0 °F)
Solubility(ies)	
Water solubility	: negligible
Solubility in other solvents	: Data not available
Partition coefficient: n-octanol/water	: log Pow: ca. -0.3 - 7
Auto-ignition temperature	: > 250 °C / 482 °F
Decomposition temperature	: Data not available
Viscosity	
Viscosity, dynamic	: Data not available
Viscosity, kinematic	: 0.25 - 0.75 mm <sup>2</sup> /s (40.0 °C / 104.0 °F)
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

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Particle size : Data not available

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### 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).
- 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 : LD50 Oral Rat: > 5,000 mg/kg  
Remarks: Low toxicity
- Acute inhalation toxicity : LC50 Rat: > 5 mg/l  
Exposure time: 4 h  
Remarks: Low toxicity

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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:

#### **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.

#### **Ethanol:**

Acute oral toxicity : LD50 Oral Rat, male and female: > 5,000 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: > 124.7 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 :  
Remarks: Based on available data, the classification criteria are not met.

### **Skin corrosion/irritation**

#### Product:

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Remarks: Irritating to skin.

### **Components:**

#### **Gasoline; Low boiling point naphtha -unspecified:**

Remarks: Irritating to skin.

#### **Ethanol:**

Species: Rabbit

Method: Test(s) equivalent or similar to OECD Test Guideline 404

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

### **Serious eye damage/eye irritation**

#### **Product:**

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

#### **Components:**

#### **Gasoline; Low boiling point naphtha -unspecified:**

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

#### **Ethanol:**

Species: Rabbit

Result: Irritating to eyes.

Method: Test(s) equivalent or similar to OECD Test Guideline 405

Remarks: Based on data from similar materials

### **Respiratory or skin sensitisation**

#### **Product:**

Remarks: Not a sensitiser.

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

#### **Components:**

#### **Gasoline; Low boiling point naphtha -unspecified:**

Remarks: Not a sensitiser.

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

#### **Ethanol:**

Species: Mouse

Method: Test(s) equivalent or similar to OECD Test Guideline 406

Remarks: Based on data from similar materials

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

### **Germ cell mutagenicity**

#### **Product:**

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: 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.

Germ cell mutagenicity-  
Assessment

: Category 1B

### **Components:**

#### **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.

Germ cell mutagenicity-  
Assessment

: Category 1B

#### **Ethanol:**

: Test species: Mouse Method: OECD Test Guideline 478  
Remarks: Based on data from similar materials, 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.

Carcinogenicity -  
Assessment

: Category 1B

### **Components:**

#### **Gasoline; Low boiling point naphtha -unspecified:**

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

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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.

Carcinogenicity - Assessment : Category 1B

### Ethanol:

Species: Rat, (male and female)

Application Route: Oral

Method: Test(s) equivalent or similar to OECD Test Guideline 453

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.

Material	GHS/CLP Carcinogenicity Classification
Cumene	No carcinogenicity classification.
Trimethylbenzene (all isomers)	No carcinogenicity classification.
n-Hexane	No carcinogenicity classification.
Gasoline; Low boiling point naphtha -unspecified	Carcinogenicity Category 1B
Xylene, mixed isomers	No carcinogenicity classification.
Toluene	No carcinogenicity classification.
Ethanol	No carcinogenicity classification.
Ethylbenzene	No carcinogenicity classification.
Cyclohexane	No carcinogenicity classification.
Naphthalene	Carcinogenicity Category 2
Benzene	Carcinogenicity Category 1A

Material	Other Carcinogenicity Classification
Cumene	IARC: Group 2B: Possibly carcinogenic to humans
Gasoline; Low boiling point naphtha -unspecified	IARC: Group 2B: Possibly carcinogenic to humans

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Xylene, mixed isomers	IARC: Group 3: Not classifiable as to its carcinogenicity to humans
Toluene	IARC: Group 3: Not classifiable as to its carcinogenicity to humans
Ethanol	IARC: Group 1: Carcinogenic to humans
Ethylbenzene	IARC: Group 2B: Possibly carcinogenic to humans
Naphthalene	IARC: Group 2B: Possibly carcinogenic to humans
Benzene	IARC: Group 1: Carcinogenic 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: Ethanol, a component of this material, may cause birth defects and/or miscarriages following high oral doses.

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

#### Components:

##### 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.

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

**Ethanol:**

Species: Mouse  
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.

Effects on foetal development : 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., Causes foetotoxicity in animals at doses which are maternally toxic., Ethanol, a component of this material, may cause birth defects and/or miscarriages.

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:**

**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.

**Ethanol:**

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

### STOT - repeated exposure

**Product:**

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

**Components:**

**Gasoline; Low boiling point naphtha -unspecified:**

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

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humans

### **Ethanol:**

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

### **Repeated dose toxicity**

#### **Components:**

#### **Ethanol:**

Rat, male and female:

Method: OECD Test Guideline 408

Remarks: No significant adverse effects were reported

### **Aspiration toxicity**

#### **Product:**

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

#### **Components:**

#### **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., 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:**

#### **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.

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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:

##### **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 : Remarks: LL/EL/IL50 > 1 <= 10 mg/l



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of which, by volume, distills at a temperature of 370°C (700°F) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

### Components:

#### **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 340°C (645°F) and (b) at least 95% of which, by volume, distills at a temperature of 370°C (700°F) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

#### **Ethanol :**

Biodegradability : Biodegradation: 84 %  
Exposure time: 20 d  
Method: Test(s) equivalent or similar to OECD Guideline 301 B  
Remarks: Readily biodegradable.  
Oxidises rapidly by photo-chemical reactions in air.

### **Bioaccumulative potential**

#### Product:

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

Partition coefficient: n-octanol/water : log Pow: ca. -0.3 - 7

#### Components:

#### **Gasoline; Low boiling point naphtha -unspecified :**

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

#### **Ethanol :**

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Partition coefficient: n-octanol/water : log Pow: < 1

### **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.

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### Components:

#### **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)

#### **Ethanol :**

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

### **Other adverse effects**

#### Product:

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

### Components:

#### **Gasoline; Low boiling point naphtha -unspecified :**

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

#### **Ethanol :**

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 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.  
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.  
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.  
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.

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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.

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### 14. TRANSPORT INFORMATION

#### International Regulations

##### ADR

UN number : 1203  
Proper shipping name : GASOLINE  
Class : 3  
Packing group : II  
Labels : 3  
Hazard Identification Number : 33  
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.

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### 15. REGULATORY INFORMATION

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

Hazardous Substance Act. B.E. 2535

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Notification of Ministry of Industry on Hazard Classification and Communication System of Hazardous Substances B.E. 2555

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

Notification of the Ministry of Industry on the Transport of Hazardous Substances Responsible by the Department of Industrial Works B.E. 2558 (2015)

Notification of the Ministry of Industry Re: Registration of Containers Used to Transport Hazardous Materials Responsible by the Department of Industrial Works B.E. 2558 (2015)

Notification of the Department of Land Transport Re: Transport Documents that Must Be Provided for Vehicles Used in the Transport of Dangerous Goods B.E. 2563 (2020)

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### 16. OTHER INFORMATION

#### Full text of H-Statements

H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H304	May be fatal 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.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

#### Full text of other abbreviations

Aquatic Acute	Short-term (acute) aquatic hazard
Aquatic Chronic	Long-term (chronic) aquatic 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

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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; KECl - 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; TECl - 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.

Other information **There has been an increase in the Physical Hazard classification of this product in section 2. Ensure that the related sections (particularly sections 9) are carefully studied.**

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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