

# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR  
1910.1200

## Shell Polymers Monaca PE3 Heavies

Version	Revision Date:	SDS Number:	Print Date: 03/13/2025
9.0	03/06/2025	800010039383	Date of last issue: 05/08/2024

### SECTION 1. IDENTIFICATION

Product name : Shell Polymers Monaca PE3 Heavies

Product code : E6125

#### Manufacturer or supplier's details

Company	: <b>Shell Chemical LP</b> PO Box 576 HOUSTON TX 77001 USA
SDS Request	: 1-800-240-6737
Customer Service	: 1-855-697-4355

#### Emergency telephone number

Chemtrec Domestic (24 hr)	: 1-800-424-9300
Chemtrec International (24 hr)	: 1-703-527-3887

#### Recommended use of the chemical and restrictions on use

Recommended use	: Fuel, Refinery Feedstock.
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 must not be used in applications other than the above without first seeking the advice of the supplier.

### SECTION 2. HAZARDS IDENTIFICATION

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

Flammable liquids	: Category 1
Aspiration hazard	: Category 1
Skin irritation	: Category 2
Specific target organ toxicity - single exposure	: Category 3
Germ cell mutagenicity	: Category 1B

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Carcinogenicity : Category 1A

Reproductive toxicity : Category 2

Specific target organ toxicity  
- repeated exposure : Category 1

Short-term (acute) aquatic  
hazard : Category 1

Long-term (chronic) aquatic  
hazard : Category 1

### GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : **PHYSICAL HAZARDS:**  
H224 Extremely flammable liquid and vapour.  
**HEALTH HAZARDS:**  
H304 May be fatal if swallowed and enters airways.  
H315 Causes skin irritation.  
H336 May cause drowsiness or dizziness.  
H340 May cause genetic defects.  
H350 May cause cancer.  
H361 Suspected of damaging fertility or the unborn child.  
H372 Causes damage to organs through prolonged or repeated exposure.  
**Environmental hazards**  
H400 Very toxic to aquatic life.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.  
P222 Do not allow contact with air.  
P240 Ground/bond container and receiving equipment.  
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P264 Wash skin thoroughly after handling.  
P271 Use only outdoors or in a well-ventilated area.  
P273 Avoid release to the environment.

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P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

### Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P312 Call a POISON CENTER or doctor/ physician if you feel unwell.

P314 Get medical advice/ attention if you feel unwell.

P331 Do NOT induce vomiting.

P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P335 + P334 Brush off loose particles from skin. Immerse in cool water or wrap in wet bandages.

P362 Take off contaminated clothing and wash before reuse.

P370 + P378 In case of fire: Use alcohol-resistant foam, carbon dioxide or dry sand to extinguish.

P370 + P378 In case of fire: Use appropriate media to extinguish.

P391 Collect spillage.

### Storage:

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

P405 Store locked up.

P235 Keep cool.

P422 Store contents under inert gas.

### Disposal:

P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

### Other hazards which do not result in classification

May form flammable/explosive vapour-air mixture.

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.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

### Hazardous components

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Chemical name	Synonyms	CAS-No.	Concentration (% w/w)
n-octane	octane	111-65-9	28.5
n-Hexane	n-hexane	110-54-3	23.8
hexene	hexene	25264-93-1	19
Decane	decane	124-18-5	9.5
dodecane	dodecane	112-40-3	4.8
isobutane	isobutane (Gas)	75-28-5	3.8
tetradecane	tetradecane	629-59-4	3.8
Benzene	Benzene	71-43-2	3
Toluene	Toluene	108-88-3	1.8
Hexadecane	hexadecane	544-76-3	0.9
Octadecane	octadecane	593-45-3	0.9
styrene	styrene	100-42-5	0.2

### Further information

Contains:

Chemical name	Identification number	Concentration (% w/w)
Triethylaluminum	97-93-8	>=0.003 - <=0.024

## SECTION 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.
- 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.  
Potential for chemical pneumonitis.
- Most important symptoms and effects, both acute and delayed : Ingestion may result in nausea, vomiting and/or diarrhoea.  
If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest

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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.  
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination.  
Continued inhalation may result in unconsciousness and death.  
Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.  
No specific hazards under normal use conditions.  
Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.

- Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
- Indication of any immediate medical attention and special treatment needed : Potential for chemical pneumonitis.  
Call a doctor or poison control center for guidance.  
Do not induce vomiting.  
Treat symptomatically.
- Call a doctor or poison control center for guidance.  
Treat symptomatically.

### SECTION 5. FIREFIGHTING 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 water in a jet.
- Specific hazards during fire-fighting : Clear fire area of all non-emergency personnel.  
Hazardous combustion products may include:  
A complex mixture of airborne solid and liquid particulates and gases (smoke).  
Carbon monoxide.  
Unidentified organic and inorganic compounds.  
Flammable vapours may be present even at temperatures below the flash point.  
The vapour is heavier than air, spreads along the ground and distant ignition is possible.  
Will float and can be reignited on surface water.
- Specific extinguishing methods : Standard procedure for chemical fires.
- Further information : Keep adjacent containers cool by spraying with water.
- Special protective equipment : Proper protective equipment including chemical resistant

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for firefighters

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).

### SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Observe all relevant local and international regulations. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Avoid contact with skin, eyes and clothing. Isolate hazard area and deny entry to unnecessary or unprotected personnel. Do not breathe fumes, vapour. Do not operate electrical equipment.

Environmental precautions

: Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas indicator.

Methods and materials for containment and cleaning up

: For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. Ventilate contaminated area thoroughly. If contamination of site occurs remediation may require specialist advice.

Additional advice

: For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.

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U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Section 15) to the National Response Center at (800) 424-8802.

Under Section 311 of the Clean Water Act (CWA) this material is considered an oil. As such, spills into surface waters must be reported to the National Response Center at (800) 424-8802.

This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

### SECTION 7. HANDLING AND STORAGE

- Technical measures : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.  
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.  
Ensure that all local regulations regarding handling and storage facilities are followed.
- Advice on safe handling : Avoid inhaling vapour and/or mists.  
Avoid contact with skin, eyes and clothing.  
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.  
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.  
Bulk storage tanks should be diked (bunded).  
When using do not eat or drink.  
  
The vapour is heavier than air, spreads along the ground and distant ignition is possible.
- 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 ( $\leq 1$  m/s until fill pipe submerged to twice its diameter, then  $\leq 7$  m/s). Avoid splash filling. Do NOT use

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compressed air for filling, discharging, or handling operations.

Refer to guidance under Handling section.

Conditions for safe storage : Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Further information on storage stability : Storage Temperature:  
Ambient.

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.  
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat.  
Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment.  
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.

Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel., For container paints, use epoxy paint, zinc silicate paint.  
Unsuitable material: Avoid prolonged contact with natural, butyl or nitrile rubbers.

Container Advice : Do not cut, drill, grind, weld or perform similar operations on or near containers.

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

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Components with workplace control parameters

Components	CAS-No.	Value type	Control parame-	Basis
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		(Form of exposure)	ters / Permissible concentration	
isobutane	75-28-5	STEL	1,000 ppm	ACGIH
n-Hexane	110-54-3	TWA	500 ppm 1,800 mg/m3	OSHA Z-1
n-Hexane		TWA	50 ppm	ACGIH
n-octane	111-65-9	TWA	500 ppm 2,350 mg/m3	OSHA Z-1
n-octane		TWA	300 ppm	ACGIH
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)
<b>Benzene</b>		<b>TWA</b>	<b>0.02 ppm</b>	<b>ACGIH</b>
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 (10 minutes)	OSHA Z-2
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 (10 minutes)	OSHA Z-2
styrene	100-42-5	TWA	20 ppm 85 mg/m3	Shell Internal Standard (SIS) for 8 hour TWA.
Further information: The value is provided by the Industry Association. This value is provided for information only.				
styrene		TWA	100 ppm	OSHA Z-2
styrene		CEIL	200 ppm	OSHA Z-2
styrene		Peak	600 ppm (5 mins. in any 3 hrs.)	OSHA Z-2
styrene		TWA	10 ppm	ACGIH
styrene		STEL	20 ppm	ACGIH
n-octane	111-65-9	TWA	500 ppm 2,350 mg/m3	OSHA Z-1
n-octane		TWA	300 ppm	ACGIH
n-Hexane	110-54-3	TWA	500 ppm 1,800 mg/m3	OSHA Z-1
n-Hexane		TWA	50 ppm	ACGIH
isobutane	75-28-5	STEL	1,000 ppm	ACGIH
Benzene	71-43-2	TWA	0.25 ppm 0.8 mg/m3	Shell Internal Standard (SIS) for 8-12

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				hour TWA.
Benzene		STEL	2.5 ppm 8 mg/m3	Shell Internal Standard (SIS) for 15 min (STEL)
<b>Benzene</b>		<b>TWA</b>	<b>0.02 ppm</b>	<b>ACGIH</b>
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 (10 minutes)	OSHA Z-2
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 (10 minutes)	OSHA Z-2
styrene	100-42-5	TWA	20 ppm 85 mg/m3	Shell Internal Standard (SIS) for 8 hour TWA.
Further information: The value is provided by the Industry Association. This value is provided for information only.				
styrene		TWA	100 ppm	OSHA Z-2
styrene		CEIL	200 ppm	OSHA Z-2
styrene		Peak	600 ppm (5 mins. in any 3 hrs.)	OSHA Z-2
styrene		TWA	10 ppm	ACGIH
styrene		STEL	20 ppm	ACGIH

### Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
n-Hexane	110-54-3	2,5-Hexanedione	Urine	End of shift	0.5 mg/l	ACGIH BEI
Benzene	71-43-2	S-Phenylmercapturic acid	Urine	End of shift (As soon as possible after exposure ceases)	25 µg/g creatinine	ACGIH BEI
		t,t-Muconic acid	Urine	End of shift (As soon as possible after exposure ceases)	500 µg/g creatinine	ACGIH BEI

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Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI
		o-Cresol	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/g creatinine	ACGIH BEI
styrene	100-42-5	Mandelic acid plus phenylglyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	150 mg/g creatinine	ACGIH BEI
		Styrene	Urine	End of shift (As soon as possible after exposure ceases)	20 µg/l	ACGIH BEI
styrene	100-42-5	Mandelic acid plus phenylglyoxylic acid	Urine	End of shift (As soon as possible after exposure ceases)	150 mg/g creatinine	ACGIH BEI
		Styrene	Urine	End of shift (As soon as possible after exposure ceases)	20 µg/l	ACGIH BEI
Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI

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				after exposure ceases)		
		o-Cresol	Urine	End of shift (As soon as possible after exposure ceases)	0.3 mg/g creatinine	ACGIH BEI
Benzene	71-43-2	S-Phenylmercapturic acid	Urine	End of shift (As soon as possible after exposure ceases)	25 µg/g creatinine	ACGIH BEI
		t,t-Muconic acid	Urine	End of shift (As soon as possible after exposure ceases)	500 µg/g creatinine	ACGIH BEI
n-Hexane	110-54-3	2,5-Hexanedione	Urine	End of shift	0.5 mg/l	ACGIH BEI

### 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

- : Use sealed systems as far as possible.
- 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.
- Firewater monitors and deluge systems are recommended.
- Where material is heated, sprayed or mist formed, there is

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greater potential for airborne concentrations to be generated. 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:

### General Information

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

### Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. If air-filtering respirators are suitable for conditions of use: Select a filter suitable for organic gases and vapours [Type AX boiling point  $\leq 65^{\circ}\text{C}$  ( $149^{\circ}\text{F}$ )].

Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Hand protection  
Remarks

: Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Viton. Incidental contact/Splash protection: Nitrile rubber. PVC. For continuous contact we recommend gloves with breakthrough

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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. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

- Eye protection : Wear goggles for use against liquids and gas. If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.
- Skin and body protection : Chemical resistant gloves/gauntlets, boots, and apron. Protective clothing approved to EU Standard EN14605.
- Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Thermal hazards : Not applicable
- Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet.  
Launder contaminated clothing before re-use.  
Do not ingest. If swallowed, then seek immediate medical assistance.

### Environmental exposure controls

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

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : liquid

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Colour	:	Data not available
Odour	:	strong
Odour Threshold	:	Data not available
pH	:	Data not available
Melting point/freezing point	:	Data not available
Initial boiling point and boiling range	:	-12 - 69 °C / 11 - 156 °F
Flash point	:	-83 - -22 °C / -117 - -7 °F
Evaporation rate	:	Data not available
Flammability		
Flammability (solid, gas)	:	Extremely flammable.
Lower explosion limit and upper explosion limit / flammability limit		
Upper explosion limit / Upper flammability limit	:	Data not available
Lower explosion limit / Lower flammability limit	:	Data not available
Vapour pressure	:	2.74 bar
Relative density	:	0.674 - 0.744 Method: ASTM D4052
Density	:	0.674 - 0.744 g/cm <sup>3</sup> Method: ASTM D4052
Solubility(ies)		
Water solubility	:	Data not available
Partition coefficient: n-octanol/water	:	Data not available
Auto-ignition temperature	:	Data not available
Decomposition temperature	:	Data not available
Viscosity		
Viscosity, dynamic	:	0.187 - 0.309 mPa.s Method: ASTM D445
Viscosity, kinematic	:	0.277 - 0.415 mm <sup>2</sup> /s (38 °C / 100 °F) Method: ASTM D445
Explosive properties	:	No data available

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Oxidizing properties	:	Data not available
Surface tension	:	Data not available
Conductivity	:	Data not available
Molecular weight	:	Data not available
Particle size	:	Data not available

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### SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	No hazardous reaction is expected when handled and stored according to provisions Stable under normal conditions of use.
Possibility of hazardous reactions	:	Reacts with strong oxidising agents.
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.

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### SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product testing, and/or similar products, and/or components. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).
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#### Information on likely routes of exposure

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

#### Acute toxicity



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### **Product:**

- Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Remarks: Low toxicity  
Based on available data, the classification criteria are not met.
- Acute inhalation toxicity : LC50 (Rat): > 20 mg/l  
Exposure time: 4 h  
Remarks: Low toxicity  
Based on available data, the classification criteria are not met.
- Acute dermal toxicity : LD50 (Rat): > 2000 mg/kg  
Remarks: Low toxicity  
Based on available data, the classification criteria are not met.

### **Components:**

#### **isobutane:**

- Acute oral toxicity : Remarks: Not applicable
- Acute inhalation toxicity : LC 50 (Rat): > 20000 ppmV  
Exposure time: 4 h  
Remarks: Low toxicity by inhalation.  
Based on available data, the classification criteria are not met.
- Acute dermal toxicity : Remarks: Not applicable

#### **Benzene:**

- Acute oral toxicity : LD 50 (Rat, male): > 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, female): > 20 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.  
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
- Acute dermal toxicity : LD 50 (Rabbit): > 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.

#### **Toluene:**

- Acute oral toxicity : LD 50 (Rat, male): > 5,000 mg/kg  
Method: Test(s) equivalent or similar to OECD Test Guideline 401  
Remarks: Based on available data, the classification criteria

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are not met.

Acute inhalation toxicity : LC 50 (Rat, male and female): > 20 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.  
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

Acute dermal toxicity : LD 50 (Rabbit, male): > 5,000 mg/kg  
Method: Literature data  
Remarks: Based on available data, the classification criteria are not met.

### **styrene:**

Acute oral toxicity : LD 50 (Rat, male and female): > 5,000 mg/kg  
Method: Based on weight of evidence.  
Remarks: Low toxicity

Acute inhalation toxicity : LC 50 (Rat, Unspecified): 11.8 mg/l, 2770 ppm  
Exposure time: 4 h  
Test atmosphere: vapour  
Method: Based on weight of evidence.  
Remarks: Harmful if inhaled.

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.

### **Skin corrosion/irritation**

#### **Product:**

Remarks: Irritating to skin.

#### **Components:**

##### **isobutane:**

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

##### **Benzene:**

Species: Rabbit

Method: OECD Test Guideline 404

Remarks: Causes skin irritation.

##### **Toluene:**

Species: Rabbit

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

Remarks: Causes skin irritation.

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### **styrene:**

Species: Rabbit

Method: Based on weight of evidence.

Remarks: Causes skin irritation.

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

#### **Product:**

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

#### **Components:**

##### **isobutane:**

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

##### **Benzene:**

Species: Rabbit

Method: Literature data

Remarks: Causes serious eye irritation.

##### **Toluene:**

Species: Rabbit

Method: OECD Test Guideline 405

Remarks: Slightly irritating., Insufficient to classify.

### **styrene:**

Species: Rabbit

Method: Based on weight of evidence.

Remarks: Causes serious eye irritation.

### **Respiratory or skin sensitisation**

#### **Product:**

Remarks: Not a sensitiser.

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

#### **Components:**

##### **isobutane:**

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

##### **Benzene:**

Species: Mouse

Method: Literature data

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

##### **Toluene:**

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.

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### styrene:

Species: Humans

Method: Based on Human Evidence

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

### Germ cell mutagenicity

#### Product:

Genotoxicity in vivo : Remarks: May cause heritable genetic damage

#### Components:

##### isobutane:

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

##### Benzene:

Genotoxicity in vitro : Method: OECD Test Guideline 471  
Remarks: May cause genetic defects.

: Method: Other guideline method.  
Remarks: May cause genetic defects.

: Method: Literature data  
Remarks: May cause genetic defects.

Genotoxicity in vivo : Test species: Mouse  
Method: Test(s) equivalent or similar to OECD Test Guideline 474  
Remarks: May cause genetic defects.

Germ cell mutagenicity- Assessment : May cause genetic defects.

##### Toluene:

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

Genotoxicity in vivo : Test species: Rat  
Method: Acceptable non-standard 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.

### styrene:

Genotoxicity in vitro : Method: Based on weight of evidence.

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

Genotoxicity in vivo

: Method: Based on weight of evidence.  
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.

Germ cell mutagenicity-

### Carcinogenicity

#### Product:

Remarks: May cause cancer., Contains Benzene, CAS # 71-43-2.

#### Components:

##### **isobutane:**

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

##### **Benzene:**

Species: Rat, (male and female)

Application Route: Oral

Method: Other guideline method.

Remarks: May cause cancer., Known human carcinogen., May cause leukaemia (AML - acute myelogenous leukaemia).

Species: Mouse, (male and female)

Application Route: Inhalation

Method: Literature data

Remarks: May cause cancer., Known human carcinogen., May cause leukaemia (AML - acute myelogenous leukaemia).

Carcinogenicity - Assessment

: May cause cancer.

##### **Toluene:**

Species: Rat, (male and female)

Application Route: Inhalation

Method: 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.

##### **styrene:**

Species: Humans

Application Route: Occupational exposure

Method: Based on weight of evidence.

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

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Species: Rat  
Application Route: Inhalation  
Method: Based on weight of evidence.  
Remarks: Based on available data, the classification criteria are not met.

Species: Rat  
Application Route: Oral  
Method: Based on weight of evidence.  
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.

<b>IARC</b>	Group 1: Carcinogenic to humans	
	Benzene	71-43-2
<b>OSHA</b>	OSHA specifically regulated carcinogen	
	Benzene	71-43-2
<b>NTP</b>	Known to be human carcinogen	
	Benzene	71-43-2

### Reproductive toxicity

#### Product:

Effects on fertility :  
Remarks: Suspected of damaging fertility or the unborn child.,  
May impair fertility at doses which produce other toxic effects.,  
Contains n-Hexane, CAS # 110-54-3.

#### Components:

##### **isobutane:**

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

##### **Benzene:**

Effects on fertility :  
Species: Rat  
Sex: male and female  
Application Route: Inhalation  
Method: Test(s) equivalent or similar to OECD Test Guideline 415.  
Remarks: Based on available data, the classification criteria

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are not met.

Effects on foetal develop-  
ment

: 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.

Reproductive toxicity - As-  
sessment

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

### **Toluene:**

Effects on fertility

:  
Species: Rat  
Sex: male and female  
Application Route: Inhalation  
  
Method: OECD Test Guideline 416  
Remarks: Based on available data, the classification criteria  
are not met.

Effects on foetal develop-  
ment

: Species: Rat, female  
Application Route: Inhalation  
Method: Other guideline method.  
Remarks: Suspected of damaging the unborn child.

Reproductive toxicity - As-  
sessment

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

### **styrene:**

Effects on fertility

:  
Species: Rat  
Application Route: Inhalation  
  
Method: OECD Test Guideline 416  
Remarks: Based on available data, the classification criteria  
are not met.  
This product does not meet the criteria for classification in  
categories 1A/1B.

Effects on foetal develop-  
ment

: Species: Rat  
Application Route: Inhalation  
Method: OECD Test Guideline 416  
Remarks: Causes foetotoxicity in animals at doses which are  
maternally toxic.

Reproductive toxicity - As-  
sessment

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

### **STOT - single exposure**

#### **Product:**

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

### **Components:**

#### **isobutane:**

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

#### **Benzene:**

Remarks: Based on available data, the classification criteria are not met., Inhalation of vapours or mists may cause irritation to the respiratory system.

#### **Toluene:**

Exposure routes: Inhalation

Target Organs: Central nervous system

Remarks: May cause drowsiness or dizziness., Vapours may cause drowsiness and dizziness., Inhalation of vapours or mists may cause irritation to the respiratory system.

#### **styrene:**

Exposure routes: Inhalation

Target Organs: Respiratory system

Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system.

### **STOT - repeated exposure**

#### **Product:**

Remarks: Causes damage to organs through prolonged or repeated exposure., Peripheral nervous system: causes peripheral neuropathy which can be potentiated by ketones., Contains n-Hexane, CAS # 110-54-3.

### **Components:**

#### **isobutane:**

Remarks: Low systemic toxicity on repeated exposure., Based on available data, the classification criteria are not met.

#### **Benzene:**

Exposure routes: Oral, Inhalation

Target Organs: hematopoietic system

Remarks: Causes damage to organs through prolonged or repeated exposure., Blood-forming organs: repeated exposure affects the bone marrow., Blood: may cause haemolysis of red blood cells and/or anaemia., Immune System: animal studies on this material or its components have demonstrated immunotoxicity., May cause MDS (Myelodysplastic Syndrome)., Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest., Myelodysplastic syndrome (MDS) was observed in individuals exposed to very high levels (50 ppm to 300 ppm range) of benzene over a long period of time in the workplace. The relevance of these results to lower levels of exposure is not known.

#### **Toluene:**

Exposure routes: Inhalation

Target Organs: Central nervous system

Remarks: May cause damage to organs or organ systems through prolonged or repeated exposure., May cause damage to central nervous system, respiratory system, visual system, and auditory system through prolonged or repeated exposure., Effects were seen at high doses only.,



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Visual system: may cause decreased color perception. , These subtle changes have not been found to lead to functional colour vision deficits., Auditory system: 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., Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest., Abuse of vapours has been associated with organ damage and death.

### **styrene:**

Exposure routes: Inhalation

Target Organs: ear

Remarks: Harmful: danger of serious damage to health by prolonged exposure through inhalation., Can cause liver damage., Respiratory system: repeated exposure affects the respiratory system. Effects were seen at high doses only., Auditory system: prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats.

### **Repeated dose toxicity**

#### **Components:**

##### **Benzene:**

Species: Rat, male and female

Application Route: Oral

Method: Test(s) equivalent or similar to OECD Test Guideline 408

Target Organs: hematopoietic system

Species: Mouse, male and female

Application Route: Inhalation

Test atmosphere: vapour

Method: Literature data

Target Organs: hematopoietic system

##### **Toluene:**

Species: Rat, male and female

Application Route: Oral

Method: Test(s) equivalent or similar to Directive 67/548/EEC, Annex V, B.26

Target Organs: No specific target organs noted

Species: Rat, male and female

Application Route: Inhalation

Test atmosphere: vapour

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

Target Organs: Central nervous system

### **styrene:**

Species: Humans, Unspecified

Application Route: Inhalation

Method: Occupational exposure

Target Organs: ear

Remarks: Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Can cause liver damage.

Respiratory System: repeated exposure affects the respiratory system.

Auditory system: 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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Nervous system: repeated exposure affects the nervous system. Effects were seen at high doses only.

Species: Rat, Unspecified

Application Route: Inhalation

Test atmosphere: vapour

Method: Acceptable non-standard method.

Target Organs: ear

Remarks: Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Can cause liver damage.

Respiratory System: repeated exposure affects the respiratory system.

Auditory system: 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.

Nervous system: repeated exposure affects the nervous system. Effects were seen at high doses only.

### Aspiration toxicity

#### Product:

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

#### Components:

##### **isobutane:**

Not an aspiration hazard.

##### **Benzene:**

May be fatal if swallowed and enters airways.

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

##### **Toluene:**

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

##### **styrene:**

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

### Further information

#### Product:

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

#### Components:

##### **isobutane:**

Remarks: Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling., High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen., Exposure to

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

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

### **Benzene:**

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

### **Toluene:**

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

### **styrene:**

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

## SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : 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: Very toxic.  
LL/EL/IL50 <= 1 mg/l

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) :  
Remarks: Very toxic.  
LL/EL/IL50 <= 1 mg/l

Toxicity to algae (Acute toxicity) :  
Remarks: Very toxic.  
LL/EL/IL50 <= 1 mg/l

Toxicity to fish (Chronic toxicity) : Remarks: NOEC/NOEL > 0.1 - <=1.0 mg/l

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

Toxicity to microorganisms (Acute toxicity) : Remarks: Data not available

#### **Components:**

##### **n-octane:**

M-Factor (Acute aquatic toxicity) : 1

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### isobutane:

Toxicity to fish (Acute toxicity) : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) : Remarks: Data not available

Toxicity to algae (Acute toxicity) : Remarks: Data not available

Toxicity to fish (Chronic toxicity) : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: Data not available

Toxicity to microorganisms (Acute toxicity) : Remarks: Data not available

### Benzene:

Toxicity to fish (Acute toxicity) : LC50 (Oncorhynchus mykiss (rainbow trout)): 5.3 mg/l  
Exposure time: 96 h  
Method: Test(s) equivalent or similar to OECD Guideline 203  
Remarks: Toxic  
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) : EC50 (Daphnia magna (Water flea)): 10 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: Toxic  
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to algae (Acute toxicity) : ErC50 (Selenastrum capricornutum (green algae)): 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: Harmful  
LL/EL/IL50 >10 <= 100 mg/l

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 0.8 mg/l  
Exposure time: 32 d  
Method: Other guideline method.  
Remarks: NOEC/NOEL > 0.1 - <=1.0 mg/l

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia dubia (Water flea)): 3 mg/l  
Exposure time: 7 d  
Method: Other guideline method.  
Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l

Toxicity to microorganisms (Acute toxicity) : IC50 (Nitrosomonas): 13 mg/l  
Exposure time: 24 h

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Method: Literature data.  
Remarks: Harmful  
LL/EL/IL50 >10 <= 100 mg/l

### Toluene:

Toxicity to fish (Acute toxicity) : LC50 (Oncorhynchus kisutch (coho salmon)): 4.02 mg/l  
Exposure time: 96 h  
Method: Literature data.  
Remarks: Toxic  
LC/EC/IC50 >1 - <=10 mg/l

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity)

LC50 (Ceriodaphnia dubia (water flea)): 3.78 mg/l  
Exposure time: 48 h  
Method: Other guideline method.  
Remarks: Toxic  
LC/EC/IC50 >1 - <=10 mg/l

Toxicity to algae (Acute toxicity) : EC50 (Chlorella vulgaris (Fresh water algae)): 134 mg/l  
Exposure time: 3 h  
Method: Literature data.  
Remarks: Practically non toxic:  
LC/EC/IC50 > 100 mg/l

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus kisutch (coho salmon)): 1.4 mg/l  
Exposure time: 40 d  
Method: Literature data.  
Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia dubia (Water flea)): 0.74 mg/l  
Exposure time: 7 d  
Method: Other guideline method.  
Remarks: NOEC/NOEL > 0.1 - <=1.0 mg/l

Toxicity to microorganisms (Acute toxicity) : EC50 (Nitrosomonas): 84 mg/l  
Exposure time: 24 h  
Method: Literature data.  
Remarks: Harmful  
LL/EL/IL50 10-100 mg/l

### styrene:

Toxicity to fish (Acute toxicity) : LC50 (Pimephales promelas (fathead minnow)): 4.02 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: Toxic  
LC/EC/IC50 >1 - <=10 mg/l

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) : EC50 (Daphnia magna (Water flea)): 4.7 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

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	Remarks: Toxic LC/EC/IC50 >1 - <=10 mg/l
Toxicity to algae (Acute toxicity)	: ErC50 (Pseudokirchneriella subcapitata (algae)): 4.9 mg/l Exposure time: 96 h Method: Test(s) equivalent or similar to OECD Test Guideline 201 Remarks: Toxic NOEC/NOEL > 1.0 - <= 10 mg/l
Toxicity to fish (Chronic toxicity)	: Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 1.01 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Remarks: NOEC/NOEL > 1.0 - <=10 mg/l (based on test data)
Toxicity to microorganisms (Acute toxicity)	: LC50 (Activated sludge): 500 mg/l Exposure time: 3 h Method: Test(s) equivalent or similar to OECD Guideline 209 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l

### Persistence and degradability

#### Product:

Biodegradability : Remarks: Data not available

#### Components:

##### **isobutane:**

Biodegradability : Remarks: Oxidises rapidly by photo-chemical reactions in air.  
Readily biodegradable.

##### **Benzene:**

Biodegradability : Biodegradation: 96 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F  
Remarks: Readily biodegradable.  
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."

##### **Toluene:**

Biodegradability : Biodegradation: 81 %  
Exposure time: 5 d

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Method: ASTM D1252-67  
Remarks: Readily biodegradable.

Remarks: 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."

### styrene:

Biodegradability : Biodegradation: 70.9 %  
Exposure time: 28 d  
Method: ISO DIS 9408  
Remarks: Readily biodegradable.

### Bioaccumulative potential

#### Product:

Bioaccumulation : Remarks: Data not available

#### Components:

##### isobutane:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

##### Benzene:

Bioaccumulation : Species: Leuciscus idus (Golden orfe)  
Bioconcentration factor (BCF): < 10  
Exposure time: 3 d  
Method: Test(s) equivalent or similar to OECD Test Guideline 305  
Remarks: Does not bioaccumulate significantly.

##### Toluene:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

##### styrene:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

### Mobility in soil

#### Product:

Mobility : Remarks: Floats on water.

#### Components:

##### isobutane:

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Mobility : Remarks: Because of their extreme volatility, air is the only environmental compartment that hydrocarbon gases will be found.

### **Benzene:**

Mobility : Remarks: Floats on water.

### **Toluene:**

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

### **styrene:**

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

### **Other adverse effects**

#### **Product:**

Additional ecological information : Physical properties indicate that hydrocarbon gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice.

#### **Components:**

##### **isobutane:**

Additional ecological information : In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

##### **Benzene:**

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.

##### **Toluene:**

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.

##### **styrene:**

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.



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### SECTION 13. DISPOSAL CONSIDERATIONS

#### Disposal methods

Waste from residues

- : Recover or recycle if possible.  
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.  
Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.  
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.

Waste, spills or used product is dangerous waste.

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

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.  
Comply with any local recovery or waste disposal regulations.

### SECTION 14. TRANSPORT INFORMATION

#### National Regulations

##### 49 CFR

- UN/ID/NA number : UN 3295  
Proper shipping name : HYDROCARBONS, LIQUID, N.O.S.  
Class : 3  
Packing group : I  
Labels : 3  
Reportable quantity : BENZENE  
(10 lb)  
TOLUENE

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(1,000 lb)  
ERG Code : 128  
Marine pollutant : yes (OCTANES Hexane)

### International Regulations

#### IATA-DGR

UN/ID No. : UN 3295  
Proper shipping name : HYDROCARBONS, LIQUID, N.O.S.  
Class : 3  
Packing group : I  
Labels : 3

#### IMDG-Code

UN number : UN 3295  
Proper shipping name : HYDROCARBONS, LIQUID, N.O.S.  
(OCTANES, Hexane)  
Class : 3  
Packing group : I  
Labels : 3  
Marine pollutant : yes

### Maritime transport in bulk according to IMO instruments

Pollution category : Data not available  
Ship type : Data not available  
Product name : Data not available

### Special precautions for user

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

## SECTION 15. REGULATORY INFORMATION

### EPCRA - Emergency Planning and Community Right-to-Know Act

#### CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
<b>Benzene</b>	<b>71-43-2</b>	<b>10</b>	<b>333</b>
<b>isobutane</b>	<b>75-28-5</b>	<b>100</b>	<b>2631</b>
<b>n-Hexane</b>	<b>110-54-3</b>	<b>5000</b>	<b>*</b>
<b>Toluene</b>	<b>108-88-3</b>	<b>1000</b>	<b>*</b>
<b>styrene</b>	<b>100-42-5</b>	<b>1000</b>	<b>*</b>

\*: Calculated RQ exceeds reasonably attainable upper limit.  
Calculated RQ exceeds reasonably attainable upper limit., The components with RQs are given for information.

#### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

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### SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

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

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

n-Hexane	110-54-3	>= 20 - < 30 %
Benzene	71-43-2	>= 1 - < 5 %
Toluene	108-88-3	>= 1 - < 5 %
styrene	100-42-5	>= 0.1 - < 1 %

### Clean Water Act

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

Benzene	71-43-2	3 %
Toluene	108-88-3	1.8 %
styrene	100-42-5	0.2 %

### US State Regulations

#### Pennsylvania Right To Know

n-octane	111-65-9
n-Hexane	110-54-3
Decane	124-18-5
isobutane	75-28-5
Benzene	71-43-2
Toluene	108-88-3
styrene	100-42-5

#### California Prop. 65

WARNING: This product can expose you to chemicals including Benzene, styrene, which is/are known to the State of California to cause cancer, and n-Hexane, Benzene, Toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

#### California List of Hazardous Substances

n-octane	111-65-9
n-Hexane	110-54-3
Benzene	71-43-2
Toluene	108-88-3

#### California Regulated Carcinogens

Benzene	71-43-2
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### Other regulations:

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

## SECTION 16. OTHER INFORMATION

### Further information

NFPA Rating (Health, Fire, Reactivity) 2, 4, 1

### Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	: ACGIH - Biological Exposure Indices (BEI)
OSHA CARC	: OSHA Specifically Regulated Chemicals/Carcinogens
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2	: USA. Occupational Exposure Limits (OSHA) - Table Z-2
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / STEL	: Short-term exposure limit
OSHA CARC / PEL	: Permissible exposure limit (PEL)
OSHA CARC / STEL	: Excursion limit
OSHA Z-1 / TWA	: 8-hour time weighted average
OSHA Z-2 / TWA	: 8-hour time weighted average
OSHA Z-2 / CEIL	: Acceptable ceiling concentration
OSHA Z-2 / Peak	: Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
Abbreviations and Acronyms	: The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists  
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road  
AICS = Australian Inventory of Chemical Substances  
ASTM = American Society for Testing and Materials  
BEL = Biological exposure limits  
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes  
CAS = Chemical Abstracts Service  
CEFIC = European Chemical Industry Council  
CLP = Classification Packaging and Labelling  
COC = Cleveland Open-Cup  
DIN = Deutsches Institut für Normung  
DMEL = Derived Minimal Effect Level  
DNEL = Derived No Effect Level  
DSL = Canada Domestic Substance List  
EC = European Commission  
EC50 = Effective Concentration fifty  
ECETOC = European Center on Ecotoxicology and Toxicology

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gy Of Chemicals  
ECHA = European Chemicals Agency  
EINECS = The European Inventory of Existing Commercial Chemical Substances  
EL50 = Effective Loading fifty  
ENCS = Japanese Existing and New Chemical Substances Inventory  
EWC = European Waste Code  
GHS = Globally Harmonised System of Classification and Labelling of Chemicals  
IARC = International Agency for Research on Cancer  
IATA = International Air Transport Association  
IC50 = Inhibitory Concentration fifty  
IL50 = Inhibitory Level fifty  
IMDG = International Maritime Dangerous Goods  
INV = Chinese Chemicals Inventory  
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables  
KECI = Korea Existing Chemicals Inventory  
LC50 = Lethal Concentration fifty  
LD50 = Lethal Dose fifty per cent.  
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading  
LL50 = Lethal Loading fifty  
MARPOL = International Convention for the Prevention of Pollution From Ships  
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level  
OE\_HP = Occupational Exposure - High Production Volume  
PBT = Persistent, Bioaccumulative and Toxic  
PICCS = Philippine Inventory of Chemicals and Chemical Substances  
PNEC = Predicted No Effect Concentration  
REACH = Registration Evaluation And Authorisation Of Chemicals  
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail  
SKIN\_DES = Skin Designation  
STEL = Short term exposure limit  
TRA = Targeted Risk Assessment  
TSCA = US Toxic Substances Control Act  
TWA = Time-Weighted Average  
vPvB = very Persistent and very Bioaccumulative

A vertical bar (|) in the left margin indicates an amendment from the previous version.

|| There has been a decrease in the Physical Hazards classification of this product in section 2.

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

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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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