

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : AVGAS 100LL (<0.1% benzene)
Product code : 002C0199

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Low lead content aviation gasoline fuel for piston engined aircraft
Please refer to Ch16 and/or the annexes for the registered uses under REACH.

Uses advised against :
This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : **Shell Aviation Ireland Limited**
Corrib House
52 Lower Leeson Street
Dublin 2
Ireland

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

1.4 Emergency telephone number : +44-(0) 151-350-4595

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 1	H224: Extremely flammable liquid and vapour.
Acute toxicity, Category 4, Oral	H302: Harmful if swallowed.
Aspiration hazard, Category 1	H304: May be fatal if swallowed and enters airways.
Acute toxicity, Category 4, Dermal	H312: Harmful in contact with skin.
Skin corrosion/irritation, Category 2	H315: Causes skin irritation.
Acute toxicity, Category 4, Inhalation	H332: Harmful if inhaled.
Reproductive toxicity, Category 2	H361: Suspected of damaging fertility or the unborn child.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Specific target organ toxicity - single exposure, Category 3, Inhalation, Narcotic effects

H336: May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure, Category 2

H373: May cause damage to organs through prolonged or repeated exposure.

Chronic aquatic toxicity, Category 2

H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

: Danger

Hazard statements

:
H224 PHYSICAL HAZARDS:
Extremely flammable liquid and vapour.
H302 HEALTH HAZARDS:
Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H332 Harmful if inhaled.
H336 May cause drowsiness or dizziness.
H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 ENVIRONMENTAL HAZARDS:
Toxic to aquatic life with long lasting effects.

Precautionary statements

: **Prevention:**
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting.
P331 Do NOT induce vomiting.
Disposal:
P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

2.3 Other hazards

This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space. 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.

This product contains tetraethyl lead which is known to accumulate in the human body. There are indications from human epidemiological studies that exposure to tetraethyl lead may cause developmental and neurobehavioral effects in the unborn child.

Contains lead. Should not be used on surfaces liable to be chewed or sucked by children. Warning!
Contains lead.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

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 lead alkyl anti-knock additives. Maximum lead concentration: 0.56 g/l.
Maximum tetraethyl lead content is 0.125% w/w.
May also contain several additives at <0.1% v/v each.
This product is dyed for grade identification.
Includes benzene at less than 0.1 % v/v.

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
Gasoline	86290-81-5 289-220-8 / 01- 2119471335-39	Flam. Liq.1; H224 Asp. Tox.1; H304 Skin Irrit.2; H315 STOT SE3; H336 Repr.2; H361 Aquatic Chronic2; H411	<= 100
Tetraethyl lead	78-00-2 201-075-4 / 01- 2119622080-57	Repr.1A; H360 Acute Tox.2; H330 Acute Tox.1; H310 Acute Tox.2; H300 STOT RE2; H373 Aquatic Acute1; H400 Aquatic Chronic1; H410	0 - 0,125

Remarks : The substance Tetra Ethyl Lead is on the Candidate List of Substances of Very High Concern and may be included in

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

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the Annex XIV List of Substances Subject to Authorisation under REACH.

For explanation of abbreviations see section 16.

Further information

Contains:

Chemical name	Identification number	Concentration [%]
toluene	108-88-3, 203-625-9	5 - 25
Xylene, mixed isomers	1330-20-7, 215-535-7	5 - 25
Ethylbenzene	100-41-4, 202-849-4	1 - 5
cyclohexane	110-82-7, 203-806-2	1 - 5
n-Hexane	110-54-3, 203-777-6	0 - 5
Trimethylbenzene, all isomers	25551-13-7, 247-099-9	0 - 5
Naphthalene	91-20-3, 202-049-5	0 - 0,5
cumene	98-82-8, 202-704-5	0 - 0,5

SECTION 4: First aid measures

4.1 Description of first aid measures

- 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.
- 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.
- In case of eye contact : Flush eyes with water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision, or swelling persist transport to the nearest medical facility for additional treatment.
- If swallowed : 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. Protect the airway if vomiting occurs.
Give nothing by mouth.
If breathing but unconscious, place in the recovery position.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

If breathing has stopped, apply artificial respiration.
Obtain medical treatment immediately.
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.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.
The concentration of lead alkyl compounds present is not significant in the context of treating acute poisoning unless the person has been laying in a pool of the product for some time.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media : Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire.,
Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2 Special hazards arising from the substance or mixture

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.

5.3 Advice for firefighters

Special protective equipment : Proper protective equipment including chemical resistant

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

- 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).
- Further information : Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately. Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Personal precautions : 6.1.1 For non emergency personnel:
Do not breathe fumes, vapour.
Do not operate electrical equipment.
6.1.2 For emergency responders:
Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas 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 meter.
Vapour can travel for considerable distances both above and below the ground surface. Underground services (drains, pipelines, cable ducts) can provide preferential flow paths.

6.2 Environmental precautions

- 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.

6.3 Methods and materials for containment and cleaning up

- Methods for cleaning up : 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

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

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.

Take precautionary measures against static discharges.

Avoid contact with skin, eyes and clothing.

Evacuate the area of all non-essential personnel.

Ventilate contaminated area thoroughly.

If contamination of site occurs remediation may require specialist advice.

Take precautionary measures against static discharges.

Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Observe all relevant local and international regulations.

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Chapter 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 Chapter 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.

SECTION 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 Chapter 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Air-dry contaminated clothing in a well-ventilated area before laundering.
Prevent spillages.
Turn off all battery operated portable electronic devices (examples include: cellular phones, pagers and CD players) before operating gasoline pump.
Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.
Do not use as a cleaning solvent or other non-motor fuel uses.
Ensure that all local regulations regarding handling and storage facilities are followed.

Maintenance and Fuelling Activities - Avoid inhalation of vapours and contact with skin.

7.1 Precautions for safe handling

Advice on safe handling : Ensure that all local regulations regarding handling and

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

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.
Avoid exposure. Obtain special instructions before use.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.

The following activities have been associated with high levels of exposure to gasoline vapours: Top-loading of tankers, open ship loading by deck crew, drum filling/emptying and laboratory testing (particularly sample bottle washing). In the interests of air safety, aviation fuels are subject to strict quality requirements and product integrity is of paramount importance. For one source of information on international standards for the quality assurance of aviation fuels, see www.jjgonline.com.

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

7.2 Conditions for safe storage, including any incompatibilities

Other data

: Drum and small container storage: Keep containers closed when not in use. Drums should be stacked to a maximum of 3 high. Use properly labeled and closable containers. 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

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

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

Electrostatic charges will be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk. The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel., Aluminium may also be used for applications where it does not present an unnecessary fire hazard., Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM), which have been specifically tested for compatibility with this product., For container linings, use amine-adduct cured epoxy paint., For seals and gaskets use: graphite, PTFE, Viton A, Viton B.
Unsuitable material: Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene., However, some may be suitable for glove materials.

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

7.3 Specific end use(s)

Specific use(s) : Please refer to Ch16 and/or the annexes for the registered uses under REACH.

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).

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

CENELEC CLC/TR 50404 (Electrostatics – Code of practice for the avoidance of hazards due to static electricity).

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
toluene	108-88-3	TWA	50 ppm 192 mg/m3	2006/15/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
toluene	108-88-3	STEL	100 ppm 384 mg/m3	2006/15/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
toluene	108-88-3	OELV - 8 hrs (TWA)	50 ppm 192 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
toluene	108-88-3	OELV - 15 min (STEL)	100 ppm 384 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
Xylene, mixed isomers	1330-20-7	TWA	50 ppm 221 mg/m3	2000/39/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
Xylene, mixed isomers	1330-20-7	STEL	100 ppm 442 mg/m3	2000/39/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
Xylene, mixed isomers	1330-20-7	OELV - 8 hrs (TWA)	50 ppm 221 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
Xylene, mixed	1330-20-7	OELV - 15 min	100 ppm	IE OEL

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

isomers		(STEL)	442 mg/m3	
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
Ethylbenzene	100-41-4	TWA	100 ppm 442 mg/m3	2000/39/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
Ethylbenzene	100-41-4	STEL	200 ppm 884 mg/m3	2000/39/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
Ethylbenzene	100-41-4	OELV - 15 min (STEL)	200 ppm 884 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
Ethylbenzene	100-41-4	OELV - 8 hrs (TWA)	100 ppm 442 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
cyclohexane	110-82-7	TWA	200 ppm 700 mg/m3	2006/15/EC
Further information	Indicative			
cyclohexane	110-82-7	OELV - 8 hrs (TWA)	200 ppm 700 mg/m3	IE OEL
Further information	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit value should be used, Indicative Occupational Exposure Limit Value			
n-Hexane	110-54-3	TWA	20 ppm 72 mg/m3	2006/15/EC
Further information	Indicative			
n-Hexane	110-54-3	OELV - 8 hrs (TWA)	20 ppm 72 mg/m3	IE OEL
Further information	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit value should be used, Indicative Occupational Exposure Limit Value			
Trimethylbenzene, all isomers	25551-13-7	OELV - 8 hrs (TWA)	20 ppm 100 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Where no specific			

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

	short-term exposure limit is listed, a figure three times the long-term exposure limit value should be used, Indicative Occupational Exposure Limit Value			
Naphthalene	91-20-3	TWA	10 ppm 50 mg/m3	91/322/EEC
Further information	Indicative			
Naphthalene	91-20-3	OELV - 15 min (STEL)	15 ppm 75 mg/m3	IE OEL
Naphthalene	91-20-3	OELV - 8 hrs (TWA)	10 ppm 50 mg/m3	IE OEL
cumene	98-82-8	TWA	20 ppm 100 mg/m3	2000/39/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
cumene	98-82-8	STEL	50 ppm 250 mg/m3	2000/39/EC
Further information	Identifies the possibility of significant uptake through the skin, Indicative			
cumene	98-82-8	OELV - 15 min (STEL)	50 ppm 250 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
cumene	98-82-8	OELV - 8 hrs (TWA)	20 ppm 100 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Indicative Occupational Exposure Limit Value			
Tetraethyl lead	78-00-2	OELV - 8 hrs (TWA)	0,1 mg/m3	IE OEL
Further information	Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body, Repr 1A - Substances which are known human reproductive toxicants, Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit value should be used			

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

ethylbenzene

: End Use: Workers
 Exposure routes: Inhalation
 Potential health effects: Acute local effects
 Value: 293 mg/m3
 End Use: Workers
 Exposure routes: Inhalation
 Potential health effects: Long-term systemic effects
 Value: 77 mg/m3

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

End Use: Workers
Exposure routes: Dermal
Potential health effects: Long-term systemic effects
Value: 180 mg/kg bw/day
End Use: Consumers
Exposure routes: Inhalation
Potential health effects: Long-term systemic effects
Value: 15 mg/m³
End Use: Consumers
Exposure routes: Oral
Potential health effects: Long-term systemic effects
Value: 1,6 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance is a hydrocarbon with a complex, unknown or variable composition. Conventional methods of deriving PNECs are not appropriate and it is not possible to identify a single representative PNEC for such substances.

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>

8.2 Exposure controls

Engineering measures Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.

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

Use sealed systems as far as possible.

Firewater monitors and deluge systems are recommended.

Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.

Local exhaust ventilation is recommended.

Eye washes and showers for emergency use.

General Information:

Always observe good personal hygiene measures, such as washing hands after handling the material

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

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and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.

Practice good housekeeping.

Define procedures for safe handling and maintenance of controls.

Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.

Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.

Drain down system prior to equipment break-in or maintenance.

Retain drain downs in sealed storage pending disposal or for subsequent recycle.

Do not ingest. If swallowed then seek immediate medical assistance

Personal protective equipment

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.

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

The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.

Approved to EU Standard EN166.

Hand protection

Remarks : 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. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

depending on the glove make and model.

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

Skin and body protection : Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.

Protective clothing approved to EU Standard EN14605.

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 organic gases and vapours [Type A boiling point > 65°C (149°F)] meeting EN14387.

Thermal hazards : Not applicable

Environmental exposure controls

General advice : Read in conjunction with the Exposure Scenario for your specific use contained in the Annex. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Information on accidental release measures are to be found in section 6.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Appearance	: Clear, bright liquid.
Colour	: blue
Odour	: Hydrocarbon
Odour Threshold	: Data not available
pH	: Data not available
Melting point/freezing point	: < -47 °C
Initial boiling point and boiling range	: 25 - 170 °C Method: Unspecified
Flash point	: <= -40 °C Method: Unspecified
Evaporation rate	: Data not available
Flammability (solid, gas)	: Not applicable
Upper explosion limit	: 8 %(V)
Lower explosion limit	: 1 %(V)
Vapour pressure	: 380 - 490 hPa (38,0 °C) Method: Unspecified
Relative vapour density	: Data not available
Density	: ca. 744 kg/m ³ (15,0 °C) Method: Unspecified
Solubility(ies)	
Water solubility	: negligible
Solubility in other solvents	: Data not available
Partition coefficient: n-octanol/water	: log Pow: 2 - 7
Auto-ignition temperature	: > 250 °C
Decomposition temperature	: Data not available
Viscosity	
Viscosity, kinematic	: 0,5 - 0,75 mm ² /s (40 °C) Method: Unspecified
Explosive properties	: Classification Code: NOT CLASS: Not classified

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Oxidizing properties : Not applicable

9.2 Other information

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

SECTION 10: Stability and reactivity

10.1 Reactivity

May oxidise in the presence of air.

10.2 Chemical stability

Stable under normal conditions of use.

10.3 Possibility of hazardous reactions

Hazardous reactions : No hazardous reaction is expected when handled and stored according to provisions

10.4 Conditions to avoid

Conditions to avoid : Avoid heat, sparks, open flames and other ignition sources.

In certain circumstances product can ignite due to static electricity.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.

10.6 Hazardous decomposition products

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.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

SECTION 11: Toxicological information

11.1 Information on toxicological effects

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

Information on likely routes of exposure : Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity : LD 50 Rat: >300 - <=2000
Remarks: Harmful if swallowed.

Acute inhalation toxicity : LC 50 : Remarks: Harmful if inhaled.
LC50 > 10,0 - <= 20,0 mg/l

Acute dermal toxicity : LD 50 Rabbit: >1000 - <=2000 mg/kg
Remarks: Harmful in contact with skin.

Skin corrosion/irritation

Product:

Remarks: Irritating to skin.

Serious eye damage/eye irritation

Product:

Remarks: Expected to be slightly irritating.

Respiratory or skin sensitisation

Product:

Remarks: Not expected to be a sensitiser.

Germ cell mutagenicity

Product:

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

Carcinogenicity

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Product:

Remarks: Not classified as a carcinogen., Inhalation exposure to mice causes liver tumours, which are not considered relevant to humans.

Material	GHS/CLP Carcinogenicity Classification
Gasoline	No carcinogenicity classification.
Xylene, mixed isomers	No carcinogenicity classification.
toluene	No carcinogenicity classification.
Ethylbenzene	No carcinogenicity classification.
cyclohexane	No carcinogenicity classification.
Trimethylbenzene, all isomers	No carcinogenicity classification.
n-Hexane	No carcinogenicity classification.
Naphthalene	Carcinogenicity Category 2
cumene	No carcinogenicity classification.
Tetraethyl lead	No carcinogenicity classification.

Material	Other Carcinogenicity Classification
toluene	IARC: Group 3: Not classifiable as to its carcinogenicity to humans
Ethylbenzene	IARC: Group 2B: Possibly carcinogenic to humans
Naphthalene	IARC: Group 2B: Possibly carcinogenic to humans
cumene	IARC: Group 2B: Possibly carcinogenic to humans
Tetraethyl lead	IARC: Group 3: Not classifiable as to its carcinogenicity to humans

Reproductive toxicity

Product:

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

Remarks: Many case studies involving abuse during pregnancy indicate that toluene can cause birth defects, growth retardation and learning difficulties.

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

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Remarks: This product contains tetraethyl lead which may cause harm to the unborn child. Exposure to tetraethyl lead is associated with developmental effects which include reduced birth weight, reduced gestational age and neurobehavioral effects.

STOT - single exposure

Product:

Remarks: Based on human experience, breathing of vapours or mists may cause a temporary burning sensation to nose, throat and lungs., High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

STOT - repeated exposure

Product:

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

Aspiration toxicity

Product:

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

Summary on evaluation of the CMR properties

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

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

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

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

SECTION 12: Ecological information

12.1 Toxicity

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).

Product:

Toxicity to fish (Acute toxicity) : Remarks: Expected to be toxic:
LL/EL/IL50 > 1 <= 10 mg/l

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

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

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

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

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

12.2 Persistence and degradability

Product:

Biodegradability : Remarks: Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment., Oxidises rapidly by photo-chemical reactions in air.

12.3 Bioaccumulative potential

Product:

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

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

Partition coefficient: n-octanol/water : log Pow: 2 - 7

12.4 Mobility in soil

Product:

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

12.5 Results of PBT and vPvB assessment

Product:

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

12.6 Other adverse effects

Product:

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : 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.

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

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Local legislation

Remarks

: EU Waste Disposal Code (EWC):
13 07 02 petrol.

The number given to waste is associated with the appropriate usage. The user must decide if their particular use results in another waste code being assigned.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14: Transport information

14.1 UN number

ADR : 1203
RID : 1203
IMDG : 1203
IATA : 1203

14.2 Proper shipping name

ADR : GASOLINE
RID : GASOLINE
IMDG : GASOLINE
IATA : GASOLINE

14.3 Transport hazard class

ADR : 3
RID : 3
IMDG : 3
IATA : 3

14.4 Packing group

ADR
Packing group : II
Classification Code : F1
Hazard Identification Number : 33
Labels : 3
RID
Packing group : II
Classification Code : F1
Hazard Identification Number : 33
Labels : 3
IMDG
Packing group : II
Labels : 3
IATA
Packing group : II
Labels : 3

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

14.5 Environmental hazards

ADR

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

IMDG

Marine pollutant : yes

14.6 Special precautions for user

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

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category : Not applicable

Ship type : Not applicable

Product name : Not applicable

Special precautions : Not applicable

Additional Information : MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15: Regulatory information

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

15.2 Chemical safety assessment

A Chemical Safety Assessment was performed for all substances of this product.

SECTION 16: Other information

REGULATION (EC) No 1272/2008

Flammable liquids, Category 1, H224

Acute toxicity, Category 4, H302

Aspiration hazard, Category 1, H304

Acute toxicity, Category 4, H312

Skin corrosion/irritation, Category 2, H315

Acute toxicity, Category 4, H332

Reproductive toxicity, Category 2, H361

Specific target organ toxicity - single

Classification procedure:

On basis of test data.

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence determination.

Expert judgement and weight of evidence

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

exposure, Category 3, H336	determination.
Specific target organ toxicity - repeated exposure, Category 2, H373	Expert judgement and weight of evidence determination.
Chronic aquatic toxicity, Category 2, H411	Expert judgement and weight of evidence determination.

Full text of H-Statements

H224	Extremely flammable liquid and vapour.
H300	Fatal if swallowed.
H304	May be fatal if swallowed and enters airways.
H310	Fatal in contact with skin.
H315	Causes skin irritation.
H330	Fatal if inhaled.
H336	May cause drowsiness or dizziness.
H360	May damage fertility or the unborn child.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
Repr.	Reproductive toxicity
Skin Irrit.	Skin irritation
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

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

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology 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 V = 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

Further information

Other information : This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

Identified Uses according to the Use Descriptor System

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Uses - Worker

Title : Manufacture of substance- Industrial

Uses - Worker

Title : Use as an intermediate- Industrial

Uses - Worker

Title : Distribution of substance- Industrial

Uses - Worker

Title : Formulation & (re)packing of substances and mixtures-
Industrial

Uses - Worker

Title : Use as a fuel- Industrial

Uses - Worker

Title : Use as a fuel- Professional

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Exposure Scenario - Worker

300000000028	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Manufacture of substance- Industrial
Use Descriptor	Sector of Use: SU 3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15 Environmental Release Categories: ERC1, ERC4, ESVOC SpERC 1.1.v1
Scope of process	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
------------------	------------------------------------------------------------

Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	Risk Management Measures
General measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (closed systems)with sample collection	No other specific measures identified.
General exposures (open systems)	Provide extraction ventilation at points where emissions occur.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Mixing operations (closed systems)	No other specific measures identified.
Process sampling	No other specific measures identified.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Bulk transfers	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Equipment maintenance	No other specific measures identified.
Storage.	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure
Substance is complex UVCB.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	1,87E+07
Fraction of Regional tonnage used locally:	0,032
Annual site tonnage (tonnes/year):	6,0E+05
Maximum daily site tonnage (kg/day):	2,0E+06
Frequency and Duration of Use	
Continuous release.	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	0,05
Release fraction to wastewater from process (initial release prior to RMM):	3,0E-03
Release fraction to soil from process (initial release prior to RMM):	1,0E-04
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).	
Onsite waste water treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	99,0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	99,1
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	80,4
Organisational measures to prevent/limit release from site	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	99,1
STP10	2,0E+06
Assumed domestic sewage treatment plant flow (m3/d)	10.000
Conditions and Measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.	

Section 4.2 -Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.	
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.	
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org).	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Exposure Scenario - Worker

300000000029	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use as an intermediate- Industrial
Use Descriptor	Sector of Use: SU 3, SU8, SU9 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15 Environmental Release Categories: ERC6a, ESVOC SpERC 6.1a.v1
Scope of process	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
------------------	------------------------------------------------------------

Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	Risk Management Measures
General measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (closed systems)with sample collection	No other specific measures identified.
General exposures (open systems)	Provide extraction ventilation at points where emissions occur.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Mixing operations (closed systems)	No other specific measures identified.
Process sampling	No other specific measures identified.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Bulk transfers	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Equipment maintenance	No other specific measures identified.
Storage.	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure
Substance is complex UVCB.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	2,21E+06
Fraction of Regional tonnage used locally:	0,0068
Annual site tonnage (tonnes/year):	1,5E+04
Maximum daily site tonnage (kg/day):	5,0E+04
Frequency and Duration of Use	
Continuous release.	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	0,025
Release fraction to wastewater from process (initial release prior to RMM):	3,0E-03
Release fraction to soil from process (initial release prior to RMM):	1,0E-03
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Risk from environmental exposure is driven by freshwater sediment.	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	92,9
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Organisational measures to prevent/limit release from site	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,5
STP10	7,8E+04
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of substance is generated.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.	

Section 4.2 -Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.	
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.	
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org).	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Exposure Scenario - Worker

300000000030	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Distribution of substance- Industrial
Use Descriptor	Sector of Use: SU 3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15 Environmental Release Categories: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC 6C, ERC 6D, ERC7, ESVOC SpERC 1.1b.v1
Scope of process	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
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Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	Risk Management Measures
General measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (closed systems)with sample collection	No other specific measures identified.
General exposures (open systems)	Provide extraction ventilation at points where emissions occur.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Process sampling	No other specific measures identified.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Bulk closed loading and unloading.	No other specific measures identified.
Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Equipment cleaning and maintenance	No other specific measures identified.
Storage.	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure
Substance is complex UVCB.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	1,87E+07
Fraction of Regional tonnage used locally:	0,002
Annual site tonnage (tonnes/year):	3,75E+04
Maximum daily site tonnage (kg/day):	1,2E+05
Frequency and Duration of Use	
Continuous release.	
Emission Days (days/year):	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	1,0E-03
Release fraction to wastewater from process (initial release prior to RMM):	1,0E-05
Release fraction to soil from process (initial release prior to RMM):	1,0E-05
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	12
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Organisational measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,5
STP10	1,1E+06
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.	

Section 4.2 -Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org).

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Exposure Scenario - Worker

300000000031	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Formulation & (re)packing of substances and mixtures-Industrial
Use Descriptor	Sector of Use: SU 3, SU 10 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 14, PROC 15 Environmental Release Categories: ERC2, ESVOC SpERC 2.2.v1
Scope of process	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
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Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	Risk Management Measures
General measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (closed systems)with sample collection	No other specific measures identified.
General exposures (open systems)	Provide extraction ventilation at points where emissions occur.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Process sampling	No other specific measures identified.
Mixing operations (closed systems)	Provide extraction ventilation at points where emissions occur.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Bulk transfers	Ensure material transfers are under containment or extract ventilation.
Manual Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation.
Drum/batch transfers	Ensure material transfers are under containment or extract ventilation.
Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation.
Equipment cleaning and maintenance	No other specific measures identified.
Storage.	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure
Substance is complex UVCB.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	1,65E+07
Fraction of Regional tonnage used locally:	0,0018
Annual site tonnage (tonnes/year):	3,0E+04
Maximum daily site tonnage (kg/day):	1,0E+05
Frequency and Duration of Use	
Continuous release.	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	0,025
Release fraction to wastewater from process (initial release prior to RMM):	2,0E-03
Release fraction to soil from process (initial release prior to RMM):	1,0E-04
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

wastewater.	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	56,5
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	94,7
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Organisational measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,5
STP10	1,0E+05
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
<p>Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.</p> <p>Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p> <p>Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.</p> <p>Risk Management Measures are based on qualitative risk characterisation.</p>	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Section 4.2 -Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org).

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Exposure Scenario - Worker

300000000032	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use as a fuel- Industrial
Use Descriptor	Sector of Use: SU 3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 16 Environmental Release Categories: ERC7, ESVOC SpERC 7.12a.v1
Scope of process	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
------------------	------------------------------------------------------------

Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	Risk Management Measures
General measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
Bulk closed unloading.	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Refueling.	No other specific measures identified.
Refuelling aircraft.	Ensure material transfers are under containment or extract ventilation.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Use as a fuel(closed systems)	No other specific measures identified.
Equipment maintenance	No other specific measures identified.
Storage.	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure
Substance is complex UVCB.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	1,4E+06
Fraction of Regional tonnage used locally:	1
Annual site tonnage (tonnes/year):	1,4E+06
Maximum daily site tonnage (kg/day):	4,6E+06
Frequency and Duration of Use	
Continuous release.	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	2,5E-03
Release fraction to wastewater from process (initial release prior to RMM):	1,0E-05
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	99,4
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	76,9
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Organisational measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and Measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,5

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

STP10	4,6E+06
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Waste combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of substance is generated.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.	

Section 4.2 -Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.	
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.	
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org).	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Exposure Scenario - Worker

300000000033	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use as a fuel- Professional
Use Descriptor	Sector of Use: SU 22 Process Categories: PROC 1, PROC 2, PROC 3, PROC 8a, PROC 8b, PROC 16 Environmental Release Categories: ERC9a, ERC9b, ESVOC SpERC 9.12b.v1
Scope of process	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
------------------	------------------------------------------------------------

Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.	

Contributing Scenarios	Risk Management Measures
General measures (skin irritants).	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
Preparation of material for application Mixing operations (closed systems)	No other specific measures identified.
Bulk closed unloading.	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Refueling.	No other specific measures identified.
Use as a fuel(closed systems)	No other specific measures identified.
Equipment maintenance	Drain down system prior to equipment opening or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.
Storage.	No other specific measures identified.

Section 2.2	Control of Environmental Exposure
Substance is complex UVCB.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0,1
Regional use tonnage (tonnes/year):	1,19E+06
Fraction of Regional tonnage used locally:	5,0E-04
Annual site tonnage (tonnes/year):	5,9E+02
Maximum daily site tonnage (kg/day):	1,6E+03
Frequency and Duration of Use	
Continuous release.	
Emission Days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	0,01
Release fraction to wastewater from process (initial release prior to RMM):	1,0E-05
Release fraction to soil from process (initial release prior to RMM):	1,0E-05
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	3,4
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	
0	
Organisational measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and Measures related to municipal sewage treatment plant	

SAFETY DATA SHEET

Regulation 1907/2006/EC

AVGAS 100LL (<0.1% benzene)

Version 2.2

Revision Date 12.04.2016

Print Date 14.04.2016

Estimated substance removal from wastewater via domestic sewage treatment (%)	95,5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,5
STP10	1,5E+04
Assumed domestic sewage treatment plant flow (m3/d)	2.000
Conditions and Measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Waste combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of substance is generated.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	

Section 3.2 -Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.	

Section 4.2 -Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.	
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.	
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org).	