

SAFETY DATA SHEET

Revision Date : 29.10.2012

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : ENGEN Primax Unleaded 95
Chemical name : Mixture - Not Applicable
Synonyms : Petrol
Product use : Automotive fuel
UN number : 1203

Supplier : Engen Petroleum Limited (Tel: +27 (0) 21 403 4911, a/h: +27 (0) 21 403 4099)
Health Emergency Telephone : +27 (0) 21 689 5227 (Red Cross Poison Service)
Transport Emergency Telephone : +27 (0) 11 975 1278/83 (Hazchemwise)
Customer Service Centre : 0860 036 436 (Sales and Technical Information)
Engen Website : <http://www.engen.co.za/>

2. HAZARDS IDENTIFICATION

Emergency response data : Green Liquid. Product can accumulate a static charge and release vapours which may cause a fire or explosion. 128

GHS Classification:**Health**

Acute inhalation toxicity	Hazard category 4. Harmful if inhaled.	Warning
Acute oral toxicity	Hazard category 5. May be harmful if swallowed.	Warning
Skin irritation	Hazard category 3. Causes mild skin irritation.	Warning
Eye irritation	Hazard category 2B. Irritant.	Warning
Aspiration hazard	Hazard category 1. May cause chemical pneumonitis.	Danger

Environmental

Aquatic toxicity	: Hazard category 2. May cause long-term adverse effects in the aquatic environment.	Warning
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Physical

Flammability	: Hazard category 1. Extremely flammable liquid and vapour.	Danger
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GHS Labels/Pictograms:**Hazard Statements**

Extremely flammable liquid and vapour. May cause eye and mild skin irritation. May be harmful if swallowed or inhaled.

Precautionary Statements**Response**

IN CASE OF FIRE: Use carbon dioxide, foam or dry chemical for extinction. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: get medical attention. IF ON SKIN: If irritation occurs, get medical attention. IF INHALED: Call a POISON CENTRE or doctor if you feel unwell.

ENGEN Primax Unleaded 95

Storage

Take precautionary measures against static discharge. Ground/bond container and receiving equipment. Use only non-sparking tools. Use explosion-proof electrical, ventilating and transfer equipment. Store in a well-ventilated place and keep the container cool and tightly closed.

Disposal

Do not discharge into lakes, streams, ponds and ground water supply.

See Section 11 for further health effects/toxicological data.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No.	Weight%
Light Straight Run Naphtha	64741-46-4	> 55.00
Toluene	108-88-3	< 20.00
Xylene	1330-20-7	< 20.00
Benzene	71-43-2	<= 5.00
Ethyl Benzene	100-41-4	< 2.00
Naphthalene	91-20-3	< 1.00

See Section 8 for Exposure Limits (if applicable).

4. FIRST AID MEASURES

Inhalation	:	Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation with a mouthpiece.
Skin contact	:	Remove contaminated clothing. Dry wipe exposed skin and cleanse with hand cleaner, soap and water. Launder contaminated clothing before reuse. (See Section 16 - Injection Injury)
Eye contact	:	Flush thoroughly with water. If irritation occurs call a doctor.
Ingestion	:	Seek immediate medical attention. Do not induce vomiting.
Note to doctors	:	Material if aspirated into the lungs may cause chemical pneumonitis. Skin contact may aggravate an existing dermatitis. Treat appropriately.

5. FIRE-FIGHTING MEASURES

Extinguishing media	:	Carbon dioxide, foam, dry chemical and water fog.
Special fire fighting procedure	:	Evacuate area. For large spills, fire fighting foam in sufficient quantities should be applied to blanket the flammable product surface.
Special protective equipment for firefighters	:	For fires in enclosed areas, fire fighters must use Self-Contained Breathing Apparatus.
Unusual fire and explosive hazards	:	EXTREMELY FLAMMABLE, HIGH HAZARD. Liquid can release considerable vapour at temperatures below ambient which readily form flammable mixtures. Vapours settle to ground level and may reach, via drains and

ENGEN Primax Unleaded 95

other underground passages, ignition sources remote from the point of escape. Product can accumulate a static charge which may cause a fire or explosion.

Products of decomposition	:	Fumes, smoke, carbon monoxide, sulphur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point	:	< -40 °C (ASTM D-56)
Upper Explosion Limit (UEL)	:	7.6 %(V)
Lower Explosion Limit (LEL)	:	1.4 %(V)
NFPA Hazard Id	:	Health: 1; Flammability: 3; Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

Procedure if material is released or spilled	:	Report spills/releases as required to appropriate authorities.
Methods for cleaning up	:	Eliminate sources of ignition. Warn occupants and/or ships in the downwind areas of fire and explosion hazard, and warn them to stay clear. LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of absorbed residues as directed in Section 13. WATER SPILL: Notify port and relevant authorities. Confine with booms if skimming equipment is available to recover the spill for later recycling or disposal.
Personal precautions	:	See Section 8.
Environmental precautions	:	Prevent spill from entering municipal sewers, water sources or low lying areas. Advise the relevant authorities if contaminations have occurred.

7. HANDLING AND STORAGE

Safe handling advice	:	Use non-sparking tools and explosion-proof equipment. Never siphon by mouth. This product should not be used as a solvent or as a cleaning agent. Harmful in contact with or if absorbed through the skin. Avoid inhalation of vapours or mists. Use in well ventilated area away from all ignition sources. This liquid is volatile and gives off invisible vapours. Either the liquid or vapour may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode. Keep product away from high energy ignition sources, heat, sparks, pilot lights, static electricity, and open flames. It is unlawful and dangerous to put petrol into unapproved containers. Do not fill container in or on a vehicle. Static electricity may ignite vapours and cause fire. Place container on ground when filling and keep nozzle in contact with container. See Section 8 for additional personal protection advice when handling this product.
Storage information	:	This product is a static accumulator, therefore, all storage containers should be grounded and bonded. Drums should also be equipped with self-closing valves, pressure vacuum bungs and flame arresters. Outside or detached storage area, with an automatic sprinkling system, is preferred.
Storage and handling procedures	:	Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGEN Primax Unleaded 95

Occupational Exposure Limits (OELs)

Components	CAS-No.	Source	TWA	Value		Notations
Light Straight Run Naphtha	64741-46-4	ACGIH OSHA	LTEL STEL LTEL STEL	900 mg/m ³ 1,500 mg/m ³ 890 mg/m ³ 1,480 mg/m ³	300 ppm 500 ppm 300 ppm 500 ppm	
Toluene	108-88-3	ACGIH TLV OSHA PEL SA OEL	LTEL STEL LTEL STEL LTEL STEL	188 mg/m ³ 560 mg/m ³ 375 mg/m ³ 560 mg/m ³ 188 mg/m ³ 560 mg/m ³	50 ppm 150 ppm 100 ppm 150 ppm 50 ppm 150 ppm	Skin; A4; BEI Estimated Skin Recommend ed Limit
Xylene	1330-20-7	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	434 mg/m ³ 651 mg/m ³ 435 mg/m ³ 655 mg/m ³	100 ppm 150 ppm 100 ppm 150 ppm	A4; BEI
Benzene	71-43-2	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	1.6 mg/m ³ 8 mg/m ³ 2 mg/m ³ 16 mg/m ³	0.5 ppm 2.5 ppm 1 ppm 5 ppm	Skin; A1; BEI
Ethyl Benzene	100-41-4	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	434 mg/m ³ 543 mg/m ³ 435 mg/m ³ 545 mg/m ³	100 ppm 125 ppm 100 ppm 125 ppm	A3; BEI
Naphthalene	91-20-3	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	52 mg/m ³ 79 mg/m ³ 50 mg/m ³ 75 mg/m ³	10 ppm 15 ppm 10 ppm 15 ppm	Skin; A4

LTEL: Long Term Exposure Limits - Time Weight Average (TWA) over 8 hours.

STEL: Short Term Exposure Limits - Time Weight Average (TWA) over 15 Minutes

Note: Limits Shown for guidance only. Follow applicable regulations.

Personal Protective Equipment (PPE)

- Engineering controls : Use in well ventilated area. Explosive-proof ventilation equipment with local exhaust is desirable.
- Respiratory protection : Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-Contained Breathing Apparatus may be required for use in confined or enclosed spaces.
- Eye protection : If splash with liquid is possible, chemical type goggles should be worn.
- Skin and body protection : Impervious gloves must be worn. If body contact is likely, appropriate personal protective equipment must be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

ENGEN Primax Unleaded 95

Colour	:	Green
Odour	:	Hydrocarbon
Boiling point	:	> 30 °C
Flash Point	:	< -40 °C (ASTM D-56)
Flammability	:	NA
Upper Explosion Limit (UEL)	:	7.6 %(V)
Lower Explosion Limit (LEL)	:	1.4 %(V)
Vapour pressure	:	200 hPa
Relative vapour density	:	3
Density	:	0.783 g/cm ³ @ 20 °C (ASTM D-4052)
Partition coefficient, log K _{ow}	:	> 1
Viscosity, kinematic	:	< 1 mm ² /s @ 40 °C (ASTM D-445) < 0.1 mm ² /s @ 100 °C

10. STABILITY AND REACTIVITY

Stability	:	Stable.
Conditions to avoid	:	Heat, sparks, flame and build up of static electricity.
Materials to avoid	:	Halogens, strong acids, alkalis and oxidizers.
Hazardous decomposition products	:	Fumes, smoke, carbon monoxide, sulphur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	(Rats): Practically non-toxic (LD50: Greater than 2000 mg/kg). Based on testing of similar products and/or components. Warning Hazard category 5. Practically non-toxic, but when swallowed can cause lung damage.
Acute dermal toxicity	:	(Rabbits): Practically non-toxic (LD50: greater than 2000 mg/kg). Based on testing of similar products and/or the components. Warning Hazard category 5. May be harmful in contact with skin.
Acute inhalation toxicity	:	(Rats): Harmful (LC50: greater than 10 but less than 20mg/l) 4 hours. Based on testing of similar products and/or the components. Warning Hazard category 4. Harmful if inhaled.
Skin irritation	:	(Rabbits): Irritant. (Primary Irritation Index: greater than 3 but less than 6). Based on testing of similar products and/or the components. Warning Hazard category 3. Causes mild skin irritation.
Eye irritation	:	(Rabbits): Mild irritant. (Draize score: greater than 6 but 15 or less). Based on testing of similar products and/or the components. Warning Hazard category 2B. Causes eye irritation.
Respiratory and skin sensitization	:	This product was not a skin sensitizer when tested in a Modified Buehler Guinea Pig Sensitization Assay.
Germ cell mutagenicity	:	This product tested negative in a series of mutagenic tests.
Carcinogenicity	:	A lifetime mouse skin painting study of unleaded gasoline applied at 50 microliters, three times weekly, resulted in some severe skin irritation and changes, but no statistically significant increase in skin cancer or cancer to any other organ. A lifetime inhalation study of vapourized unleaded gasoline at up to 2000 ppm caused liver tumours in female mice and increased kidney tumours in male rats. The kidney tumours resulted from the formation of a compound unique to male rats, and are not considered relevant to humans. The U.S. EPA Risk Assessment Forum concluded that the male rat kidney tumour results are not relevant for human risk assessment. The implications for the female

ENGEN Primax Unleaded 95

mice liver tumour data for human risk assessment have not been fully determined. Multiple short-term cancer predicative tests (Ames Test, etc.) have routinely been negative (no cancer or mutagenic potential) for unleaded gasoline.

Reproductive toxicity (Teratogenicity)	:	Two separate inhalation teratology studies of unleaded gasoline vapour at exposures up to 1600 ppm and 9000 ppm for 6 hours/day on days 6-20 did not result in any significant developmental effects in rats. No significant effects were observed in the mothers or offspring. A two-generation inhalation reproductive study (CONCAWE) of unleaded gasoline showed no reproductive or developmental effects in rats exposed to concentrations up to 20,000 mg/m ³ (approx. 8000 ppm).
Specific target organ toxicity (STOT) - single exposure	:	Respiratory irritation, dizziness, nausea and loss of consciousness. Danger Hazard category 2.
Specific target organ toxicity (STOT) - repeated exposure	:	Two dermal studies resulted in significant irritation in rabbits but no significant systemic toxicity. Inhalation exposures (90 days - approximately 1500 ppm vapour) in rats and monkeys produced light hydrocarbon nephropathy in male rats, but no other significant systemic toxicity. A lifetime mouse skin painting study of unleaded gasoline applied at 50 microliters, three times weekly, resulted in some severe skin irritation and changes, but no statistically significant increase in skin cancer or cancer to any other organ.
Aspiration hazard	:	Gasoline and Refinery Streams: Isolated constituents of gasoline may display these or other potential hazards in laboratory tests. Gasoline consists of a complex blend of petroleum/processing derived paraffinic, olefinic, naphthenic and aromatic hydrocarbons which include up to 5% benzene (with 1-2 % typical in the U.S.), n-hexane, mixed xylenes, toluene and ethylbenzene. Benzene has also caused damage to the foetus of test animals in developmental studies. Repeated exposures to low levels of benzene (50-500 ppm) have been reported to result in blood abnormalities including anaemia and, in rare cases, leukemia in both animals and humans. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. Prolonged exposure to levels of n-Hexane (<500 ppm) may show no acute symptoms but cause damage to the nervous system (peripheral neuropathy), affecting the muscles of the limbs. Paralysis may result.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish	:	(Salmon) LC/EC50: 8.1 mg/l at 96 hours. Warning Hazard category 2.
Toxicity to aquatic organisms	:	(Daphnia magna) LC/EC50: 6 mg/l at 48 hours. (Green algae) LC/EC50: 9.4 mg/l at 8 hours.

Elimination information (persistence and degradability)

Biodegradability	:	The majority of the components in this product would be expected to be inherently biodegradable. The constituents of gasoline (petrol) which are volatilized will photodegrade in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation.
Mobility	:	Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant.
Bioaccumulation	:	Bioconcentration factor (BCF) < 100.

ENGEN Primax Unleaded 95

Further information on ecology

Remarks : In the absence of specific environmental data for this product, this assessment is based on information for representative substances.

13. DISPOSAL CONSIDERATIONS

Waste disposal : Product is suitable for burning for fuel value in compliance with applicable laws and regulations, and consideration of product characteristics at time of disposal.

Contaminated packaging : Empty containers retain residue (liquid and/or vapour) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Other regulations : Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).

Flash Point : < -40 °C (ASTM D-56)

14. TRANSPORT INFORMATION

ADR

Proper shipping name : GASOLINE
UN number : 1203
Class : 3
Letter : F
Packing group : II
Labelling number : 3

CFR

Proper shipping name : GASOLINE
UN number : 1203
Class : 3
Letter : F
Packing group : II
Labelling number : 3

IATA_C

Proper shipping name : GASOLINE
UN number : 1203
Class : 3
Letter : F
Packing group : II
Labelling number : 3

IMDG

Proper shipping name : GASOLINE
UN number : 1203
Class : 3

ENGEN Primax Unleaded 95

Letter : F
Packing group : II
Labelling number : 3
Marine pollutant : Marine Pollutant
Medical First Aid Guide (MFAG) table : 311
Emergency Schedule (EmS) number : 3-07
IMDG code page number : 3141

15. REGULATORY INFORMATION

US OSHA Hazard Communication Standard : Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.

Governmental Inventory Status : All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KECI, ENCS, PICCS and IECSC.

EU Labelling : Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbols : F+, T, N
Extremely flammable, Toxic, Dangerous for the environment

R-Phrase(s) : R12, R45, R38, R65, R67, R51/53
Extremely flammable., May cause cancer., Irritating to the skin., Harmful: may cause lung damage if swallowed., Vapours may cause drowsiness and dizziness., Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-Phrase(s) : S16, S53, S45, S2, S23, S25, S29, S43, S62
Keep away from sources of ignition - No smoking., Avoid exposure - obtain special instructions before use., In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)., Keep out of the reach of children., Do not breathe vapour., Avoid contact with eyes., Do not empty into drains., In case of fire use foam/drypowder/carbon dioxide., If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Note : Contains Low Boiling Point Naphtha.

SARA

U.S. Superfund Amendments and Reauthorization Act SARA Title III : This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) Reportable Hazard Categories : Fire Chronic Acute

SARA (313) Toxic Release Chemicals: : This product contains no chemicals reportable under SARA (313) Toxic Release Chemicals:

The following product ingredients are cited on the lists below

Chemical name	CAS-No.	Concentration [%]	List Citations
Light Straight Run Naphtha	64741-46-4	> 55.00	1, 19, 20, 21, 23, 25
Toluene	108-88-3	< 20.00	1, 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
Xylene	1330-20-7	< 20.00	1, 10, 18, 19, 20, 21, 22, 23, 24, 25, 26

ENGEN Primax Unleaded 95

Benzene	71-43-2	<= 5.00	1, 2, 4, 6, 9, 10, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
Ethyl Benzene	100-41-4	< 2.00	1, 8, 10, 18, 19, 20, 21, 23, 24, 25, 26
Naphthalene	91-20-3	< 1.00	16, 22

Regulatory List Searched

1 = ACGIH ALL	6 = IARC 1	11 = TSCA 4	17 = CA P65	22 = MI 293
2 = ACGIH A1	7 = IARC 2A	12 = TSCA 5a2	18 = CA RTK	23 = MN RTK
3 = ACGIH A2	8 = IARC 2B	13 = TSCA 5e	19 = FL RTK	24 = NJ RTK
4 = NTP CARC	9 = OSHA CARC	14 = TSCA 6	20 = IL RTK	25 = PA RTK
5 = NTP SUS	10 = OSHA Z	15 = TSCA 12b	21 = LA RTK	26 = RI RTK

Code Key: CARC = Carcinogen; SUS = Suspected Carcinogen

16. OTHER INFORMATION

Note: Engen products do not contain PCBs.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a doctor as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Note: No significant changes have been made to this Safety Data Sheet since the previous date.

Disclaimer

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

Prepared by	:	Corporate Health, Safety, Environment and Quality Department Engen Petroleum Limited P.O.Box 35, Cape Town, 8000
Telephone	:	+27 (0) 21 403 4911 (Office Hours) +27 (0) 21 403 4099 (After Hours)

**MATERIAL SAFETY DATA SHEET**

Revision Date : 27.05.2008

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : ENGEN LRP 93
Chemical name : Mixture - Not Applicable
Synonyms : Petrol
UN number : 1203

Supplier : Engen Petroleum Limited (Tel: 021-403 4911, a/h: 021-403 4099)
Health Emergency Telephone : 021-689 5227 (Red Cross Poison Service)
Transport Emergency Telephone : 011-975 1278/83 (Hazchemwise)
Customer Service Center : 0860 036 436 (Sales and Technical Information)
MSDS Internet website : www.engen.co.za/content/products/default2.htm

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No.	Weight%	Symbol Codes	R-Phrase Numbers
Light Straight Run Naphtha	64741-46-4	> 55.00	F+	R12
Toluene	108-88-3	< 20.00	F, Xn	R11, R20
Xylene	1330-20-7	< 20.00	F, Xn	R10, R20/21, R38
Benzene	71-43-2	<= 5.00		
Ethyl Benzene	100-41-4	< 2.00	Xn	R20, R45
Naphthalene	91-20-3	< 1.00		R45

See Section 15 for European Label Information.

See Section 8 for Exposure Limits (if applicable).

3. HAZARDS IDENTIFICATION

Emergency response data : Green Liquid. Product can accumulate a static charge and release vapours which may cause a fire or explosion. DOT ERG No. : 128

Potential health effects

Inhalation : Long-term exposure to petrol vapour has caused kidney and liver cancer in laboratory animals. Case reports of chronic petrol abuse (such as sniffing) and chronic misuse as a solvent or as a cleaning agent have shown a range of nervous system effects, sudden deaths from heart attacks, blood effects and leukemia. These effects are not expected to occur at exposure levels encountered in the distribution and use of petrol as a motor fuel.

Skin : Irritant.

Eye : Irritant.

Ingestion : Low viscosity material if swallowed may enter the lungs and cause lung damage.

Potential environmental effects : May cause long-term adverse effects in the aquatic environment.

See Section 11 for further health effects/toxicological data.

4. FIRST AID MEASURES

Inhalation	:	Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation with a mouthpiece.
Skin contact	:	Remove contaminated clothing. Dry wipe exposed skin and cleanse with hand cleaner, soap and water. Launder contaminated clothing before reuse. (See Section 16 - Injection Injury)
Eye contact	:	Flush thoroughly with water. If irritation occurs call a doctor.
Ingestion	:	Seek immediate medical attention. Do not induce vomiting.
Note to doctors	:	Material if aspirated into the lungs may cause chemical pneumonitis. Skin contact may aggravate an existing dermatitis. Treat appropriately.

5. FIRE-FIGHTING MEASURES

Extinguishing media	:	Carbon dioxide, foam, dry chemical and water fog.
Special fire fighting procedure	:	Evacuate area. For large spills, fire fighting foam in sufficient quantities should be applied to blanket the flammable product surface.
Special protective equipment for firefighters	:	For fires in enclosed areas, fire fighters must use Self-Contained Breathing Apparatus.
Unusual fire and explosive hazards	:	EXTREMELY FLAMMABLE, HIGH HAZARD. Liquid can release considerable vapour at temperatures below ambient which readily form flammable mixtures. Vapours settle to ground level and may reach, via drains and other underground passages, ignition sources remote from the point of escape. Product can accumulate a static charge which may cause a fire or explosion.
Products of decomposition	:	Fumes, smoke, carbon monoxide, sulphur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point	:	< -40 °C (ASTM D-56)
Upper Explosion Limit (UEL)	:	7.6 %(V)
Lower Explosion Limit (LEL)	:	1.4 %(V)
NFPA Hazard Id	:	Health: 1; Flammability: 3; Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

Procedure if material is released or spilled	:	Report spills/releases as required to appropriate authorities.
Methods for cleaning up	:	Eliminate sources of ignition. Warn occupants and/or ships in the downwind areas of fire and explosion hazard, and warn them to stay clear. LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of absorbed residues as directed in Section 13. WATER SPILL: Notify port and relevant authorities. Confine with booms if skimming equipment is available to recover the spill for later recycling or disposal.
Personal precautions	:	See Section 8.
Environmental precautions	:	Prevent spill from entering municipal sewers, water sources or low lying areas. Advise the relevant authorities if contaminations have occurred.

7. HANDLING AND STORAGE

Safe handling advice	:	Use non-sparking tools and explosion-proof equipment. Never siphon by
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ENGEN LRP 93

mouth. This product should not be used as a solvent or as a cleaning agent. Harmful in contact with or if absorbed through the skin. Avoid inhalation of vapours or mists. Use in well ventilated area away from all ignition sources. This liquid is volatile and gives off invisible vapours. Either the liquid or vapour may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode. Keep product away from high energy ignition sources, heat, sparks, pilot lights, static electricity, and open flames. It is unlawful and dangerous to put petrol into unapproved containers. Do not fill container in or on a vehicle. Static electricity may ignite vapours and cause fire. Place container on ground when filling and keep nozzle in contact with container. See Section 8 for additional personal protection advice when handling this product.

Storage information	:	This product is a static accumulator, therefore, all storage containers should be grounded and bonded. Drums should also be equipped with self-closing valves, pressure vacuum bungs and flame arresters. Outside or detached storage area, with an automatic sprinkling system, is preferred.
Storage and handling procedures	:	Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits (OELs)

Components	CAS-No.	Source	TWA	Value		Notations
Light Straight Run Naphtha	64741-46-4	ACGIH OSHA	LTEL STEL LTEL STEL	900 mg/m ³ 1,500 mg/m ³ 890 mg/m ³ 1,480 mg/m ³	300 ppm 500 ppm 300 ppm 500 ppm	
Toluene	108-88-3	ACGIH TLV OSHA PEL SA OEL	LTEL STEL LTEL STEL LTEL STEL	188 mg/m ³ 560 mg/m ³ 375 mg/m ³ 560 mg/m ³ 188 mg/m ³ 560 mg/m ³	50 ppm 150 ppm 100 ppm 150 ppm 50 ppm 150 ppm	Skin; A4; BEI Estimated Skin Recommend ed Limit
Xylene	1330-20-7	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	434 mg/m ³ 651 mg/m ³ 435 mg/m ³ 655 mg/m ³	100 ppm 150 ppm 100 ppm 150 ppm	A4; BEI
Benzene	71-43-2	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	1.6 mg/m ³ 8 mg/m ³ 2 mg/m ³ 16 mg/m ³	0.5 ppm 2.5 ppm 1 ppm 5 ppm	Skin; A1; BEI
Ethyl Benzene	100-41-4	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	434 mg/m ³ 543 mg/m ³ 435 mg/m ³ 545 mg/m ³	100 ppm 125 ppm 100 ppm 125 ppm	A3; BEI
Naphthalene	91-20-3	ACGIH TLV OSHA PEL	LTEL STEL LTEL STEL	52 mg/m ³ 79 mg/m ³ 50 mg/m ³ 75 mg/m ³	10 ppm 15 ppm 10 ppm 15 ppm	Skin; A4

LTEL: Long Term Exposure Limits - Time Weight Average (TWA) over 8 hours.

STEL: Short Term Exposure Limits - Time Weight Average (TWA) over 15 Minutes

Note: Limits Shown for guidance only. Follow applicable regulations.

Personal Protection Equipment (PPE)

Engineering controls	:	Use in well ventilated area. Explosive-proof ventilation equipment with
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ENGEN LRP 93

local exhaust is desirable.

Respiratory protection	:	Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-Contained Breathing Apparatus may be required for use in confined or enclosed spaces.
Eye protection	:	If splash with liquid is possible, chemical type goggles should be worn.
Skin and body protection	:	Impervious gloves must be worn. If body contact is likely, appropriate personal protective equipment must be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid.
Colour	:	Green
Odour	:	Hydrocarbon
Boiling point	:	> 30 °C
Flash Point	:	< -40 °C (ASTM D-56)
Flammability (solid, gas)	:	NA
Upper Explosion Limit (UEL)	:	7.6 %(V)
Lower Explosion Limit (LEL)	:	1.4 %(V)
Vapour pressure	:	200 hPa
Relative vapour density	:	3
Density	:	0.783 g/cm ³ @ 20 °C (ASTM D-4052)
Partition coefficient, log K _{ow}	:	> 1
Viscosity, kinematic	:	< 1 mm ² /s @ 40 °C (ASTM D-445) < 0.1 mm ² /s @ 100 °C

10. STABILITY AND REACTIVITY

Stability	:	Stable.
Conditions to avoid	:	Heat, sparks, flame and build up of static electricity.
Materials to avoid	:	Halogens, strong acids, alkalis and oxidizers.
Hazardous decomposition products	:	Fumes, smoke, carbon monoxide, sulphur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	(Rats): Practically non-toxic (LD ₅₀ : Greater than 2000 mg/kg). Based on testing of similar products and/or components.
Acute inhalation toxicity	:	(Rats): Practically non-toxic (LC ₅₀ : greater than 5mg/l). Based on testing of similar products and/or the components.
Acute dermal toxicity	:	(Rabbits): Practically non-toxic (LD ₅₀ : greater than 2000 mg/kg). Based on testing of similar products and/or the components.
Skin irritation	:	(Rabbits): Irritant. (Primary Irritation Index: greater than 3 but less than 6). Based on testing of similar products and/or the components.
Eye irritation	:	(Rabbits): Practically non-irritating. (Draize score: greater than 6 but 15 or less). Based on testing of similar products and/or the components.
Sensitization	:	This product was not a skin sensitizer when tested in a Modified Buehler Guinea Pig Sensitization Assay.
Repeated dose toxicity	:	Two dermal studies resulted in significant irritation in rabbits but no significant systemic toxicity. Inhalation exposures (90 days - approximately 1500 ppm vapour) in rats and monkeys produced light hydrocarbon nephropathy in male rats, but no other significant systemic toxicity. A lifetime mouse skin painting study of unleaded gasoline applied at 50 microliters, three times weekly, resulted in some severe skin irritation and changes, but no statistically significant increase in skin

cancer or cancer to any other organ.

Teratogenicity	:	Two separate inhalation teratology studies of unleaded gasoline vapour at exposures up to 1600 ppm and 9000 ppm for 6 hours/day on days 6-20 did not result in any significant developmental effects in rats. No significant effects were observed in the mothers or offspring. A two-generation inhalation reproductive study (CONCAWE) of unleaded gasoline showed no reproductive or developmental effects in rats exposed to concentrations up to 20,000 mg/m ³ (approx. 8000 ppm).
Neurological effects	:	Exposure to high concentrations of unleaded gasoline in rodents caused reversible central nervous system depression, however, no persistent neurotoxic effects were observed in subchronic inhalation studies of gasoline blending streams. No neurotoxic effects, as measured by a functional observation battery, motor activity, and neuropathology, were observed in rats exposed to light alkylate naphtha for 13 weeks at concentrations up to 6600 ppm. The medical literature clearly documents neurotoxic effects in humans from abusive gasoline inhalation (sniffing).
Carcinogenicity	:	A lifetime mouse skin painting study of unleaded gasoline applied at 50 microliters, three times weekly, resulted in some severe skin irritation and changes, but no statistically significant increase in skin cancer or cancer to any other organ. A lifetime inhalation study of vapourized unleaded gasoline at up to 2000 ppm caused liver tumours in female mice and increased kidney tumours in male rats. The kidney tumours resulted from the formation of a compound unique to male rats, and are not considered relevant to humans. The U.S. EPA Risk Assessment Forum concluded that the male rat kidney tumour results are not relevant for human risk assessment. The implications for the female mice liver tumour data for human risk assessment have not been fully determined. Multiple short-term cancer predicative tests (Ames Test, etc.) have routinely been negative (no cancer or mutagenic potential) for unleaded gasoline.
Other toxicological information	:	Gasoline and Refinery Streams: Isolated constituents of gasoline may display these or other potential hazards in laboratory tests. Gasoline consists of a complex blend of petroleum/processing derived paraffinic, olefinic, naphthenic and aromatic hydrocarbons which include up to 5% benzene (with 1-2 % typical in the U.S.), n-hexane, mixed xylenes, toluene, ethylbenzene and MTBE. Benzene has also caused damage to the foetus of test animals in developmental studies. Benzene has tested positive (mutagenic) in a number of short-term cancer/mutation predicative tests. Repeated exposures to low levels of benzene (50-500 ppm) have been reported to result in blood abnormalities including anaemia and, in rare cases, leukemia in both animals and humans. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. Prolonged exposure to levels of n-Hexane (<500 ppm) may show no acute symptoms but cause damage to the nervous system (peripheral neuropathy), affecting the muscles of the limbs. Paralysis may result. Methyl Tertiary Butyl Ether (MTBE) was tested for carcinogenicity, neurotoxicity, chronic, reproductive, and developmental toxicity. The NOAEL for all end points evaluated in three animal species was 400 ppm or greater. An increase in kidney tumors/damage and liver tumors was observed in animals exposed to high concentrations of MTBE. Some embryo/fetal toxicity and birth defects were observed in the offspring of pregnant mice exposed to maternally toxic doses of MTBE, however the offspring of exposed pregnant rabbits were unaffected. The significance of the animal findings at high exposures are not believed to be directly related to potential human health hazards in the workplace.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

ENGEN LRP 93

Biodegradability	:	The majority of the components in this product would be expected to be inherently biodegradable. The constituents of gasoline (petrol) which are volatilized will photodegrade in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation.
Physico-chemical removability	:	Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant.
Bioaccumulation	:	Not established.

Ecotoxicity effects

Toxicity to fish	:	This substance has also been shown to be toxic to specific fish species (LL50 = 1-10 mg/l for rainbow trout, Atlantic silverside).
Toxicity to aquatic organisms	:	Based on test results for similar products, this substance may be toxic to aquatic organisms such as algae and daphnia (EL50/IrL50 = 1-10 mg/l).

Further information on ecology

Remarks	:	In the absence of specific environmental data for this product, this assessment is based on information for representative substances.
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13. DISPOSAL CONSIDERATIONS

Waste disposal	:	Product is suitable for burning for fuel value in compliance with applicable laws and regulations, and consideration of product characteristics at time of disposal.
Contaminated packaging	:	Empty containers retain residue (liquid and/or vapour) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.
Other regulations	:	Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).
Flash Point	:	< -40 °C (ASTM D-56)

14. TRANSPORT INFORMATION

ADR

Proper shipping name	:	GASOLINE
UN number	:	1203
DOT ERG number	:	128
Class	:	3
Letter	:	F
Packing group	:	II
Labelling number	:	3
Placard	:	Flammable

CFR

Proper shipping name	:	GASOLINE
UN number	:	1203
DOT ERG number	:	128
Class	:	3
Letter	:	F
Packing group	:	II
Labelling number	:	3
Placard	:	Flammable

ENGEN LRP 93

IATA_C

Proper shipping name	:	GASOLINE
UN number	:	1203
DOT ERG number	:	128
Class	:	3
Letter	:	F
Packing group	:	II
Labelling number	:	3
Placard	:	Flammable

IMDG

Proper shipping name	:	GASOLINE
UN number	:	1203
DOT ERG number	:	128
Class	:	3
Letter	:	F
Packing group	:	II
Labelling number	:	3
Placard	:	Flammable
Marine pollutant	:	Marine pollutant
Medical First Aid Guide (MFAG) table	:	311
Emergency Schedule (EmS) number	:	3-07
IMDG code page number	:	3141

15. REGULATORY INFORMATION

US OSHA Hazard Communication Standard	:	Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.
Governmental Inventory Status	:	All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KECI, ENCS, PICCS and IECSC.
EU Labelling	:	Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.
Symbols	:	F+, T, N Extremely flammable, Toxic, Dangerous for the environment
R-Phrase(s)	:	R12, R45, R38, R65, R67, R51/53 Extremely flammable., May cause cancer., Irritating to the skin., Harmful: may cause lung damage if swallowed., Vapours may cause drowsiness and dizziness., Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-phrase(s)	:	S16, S53, S45, S2, S23, S25, S29, S43, S62 Keep away from sources of ignition - No smoking., Avoid exposure - obtain special instructions before use., In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)., Keep out of the reach of children., Do not breathe vapour., Avoid contact with eyes., Do not empty into drains., In case of fire use foam/drypowder/carbon dioxide., If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.
Note	:	Contains Low Boiling Point Naphtha.

SARA

U.S. Superfund Amendments and Reauthorization Act SARA Title III	:	This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".
SARA (311/312) Reportable Hazard Categories	:	Fire Chronic Acute
SARA (313) Toxic Release Chemicals:	:	This product contains no chemicals reportable under SARA (313) Toxic Release Chemicals:

The following product ingredients are cited on the lists below

ENGEN LRP 93

Chemical name	CAS-No.	Concentration [%]	List Citations
Light Straight Run Naphtha	64741-46-4	> 55.00	1, 19, 20, 21, 23, 25
Toluene	108-88-3	< 20.00	1, 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
Xylene	1330-20-7	< 20.00	1, 10, 18, 19, 20, 21, 22, 23, 24, 25, 26
Benzene	71-43-2	<= 5.00	1, 2, 4, 6, 9, 10, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
Ethyl Benzene	100-41-4	< 2.00	1, 8, 10, 18, 19, 20, 21, 23, 24, 25, 26
Naphthalene	91-20-3	< 1.00	16, 22

Regulatory List Searched

1 = ACGIH ALL	6 = IARC 1	11 = TSCA 4	17 = CA P65	22 = MI 293
2 = ACGIH A1	7 = IARC 2A	12 = TSCA 5a2	18 = CA RTK	23 = MN RTK
3 = ACGIH A2	8 = IARC 2B	13 = TSCA 5e	19 = FL RTK	24 = NJ RTK
4 = NTP CARC	9 = OSHA CARC	14 = TSCA 6	20 = IL RTK	25 = PA RTK
5 = NTP SUS	10 = OSHA Z	15 = TSCA 12b	21 = LA RTK	26 = RI RTK

Code Key: CARC = Carcinogen; SUS = Suspected Carcinogen

16. OTHER INFORMATION

Note: Engen products do not contain PCBs.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for any other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a doctor as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Precautionary Label Text:

CONTAINS GASOLINE

DANGER!

EXTREMELY FLAMMABLE LIQUID AND VAPOUR. RESPIRATORY IRRITATION, HEADACHE, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.

OVEREXPOSURE TO BENZENE MAY RESULT IN CANCER, BLOOD DISORDERS, AND DAMAGE TO THE BONE MARROW. LONG-TERM EXPOSURE TO GASOLINE VAPOUR HAS CAUSED KIDNEY AND LIVER CANCER IN LABORATORY ANIMALS, BLOOD EFFECTS, AND NERVOUS SYSTEM DAMAGE.

SAFETY: Keep away from heat, sparks, and flame. Avoid all personal contact. Avoid prolonged breathing of vapour. Use with adequate ventilation. Keep container closed. Approved portable containers must be properly grounded when transferring fuel. For use as a motor fuel only. Misuse of gasoline may cause serious injury or illness. Never siphon by mouth. Not to be used as a solvent or skin cleaning agent.

FIRST AID: If inhaled, remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. In case of contact, remove contaminated clothing. Dry wipe the exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself and others. Wear impervious gloves. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a doctor.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause

ENGEN LRP 93

cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

Disclaimer

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

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